

# Assessment of status, distribution and threats to snow leopard and its prey in Kashmir

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**nature  
conservation  
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## **Executive Summary**

Snow leopard is one of the most elusive and rare wild animal species. The state of Jammu and Kashmir, with a potential habitat of 77,800 km<sup>2</sup>, is the largest continuous habitat for the snow leopard in India occupying c. 60% of its national distribution range (Anon 2008). Thus the State needs to play a critical role in the conservation of this charismatic species in India. While there have been significant developments in research and conservation initiatives in Ladakh region of the State, basic understanding of the distribution of snow leopard and its prey remains poor for the Kashmir region. This can mainly be attributed to the insurgency going on for more than two decades. The situation has improved now, thus providing an opportunity to build the much needed baseline information for species such as the snow leopard (Ranjitsinh et al 2005, Ahmad et al. 2009, Bhatnagar et al 2009, Ahmad et.al. 2010, Ahmad 2014).

We have taken this opportunity to establish the first baseline information on the status and distribution of snow leopard and its prey in Kashmir region – the main goal of the current study. We also recorded the major threats to snow leopard and its prey so that steps are taken to mitigate such threats. Such baseline information is a pre-requisite to plan effective strategies for long term management and conservation of the snow leopard, its prey species and habitats.

In this study we have been able to build baseline information on snow leopard and its prey and documented the major threats to their survival in Kashmir. Knowledgeable people such as former hunters, pastoralists and shepherds who have been using the areas in and around our study site, were identified as key informants. We had interactions and long discussions with these informants to record the relevant information about the occurrence of species was discussed with them. We had designed questionnaires to collect information information from the key informants regarding the

evidence of presence of snow leopard and its prey and the threats they have been facing. In a few areas such as Sindh and Jhelum Valley, we conducted foot surveys to record the evidences of presence of snow leopard and its prey.

We documented the occurrence of snow leopard in Kashmir for the first time, which will now open the way to initiate research and conservation initiatives in otherwise neglected subject. The Gurez-Tilel and Sindh seemed the high potential snow leopard distribution areas whereas Kajinag a moderately potential snow leopard site. The Gurez-Tilel and Sindh being connected to the Trans-Himalayas, country's best snow leopard area, which further increases its importance in snow leopard conservation. The Gurez-Tilel and Sindh have ibex, musk deer and marmots as the main prey species whereas Kajinag offers markhor and musk deer as the snow leopard prey. Retaliatory killings, habitat fragmentation and habitat deterioration were the major threats for snow leopard whereas hunting for meat and trophy and livestock grazing were the threats to Ibex and markhor. Rampant poaching of musk deer for musk continues especially in Gurez-Tilel and Sindh which has taken the toll of the endangered deer. Livestock grazing accompanied with herders and the herding dogs is happening across these snow leopard habitats disturbing the prey species. It was surprising to see the contrasting effects of insurgency on snow leopard. In areas such as Sindh, shepherds used to hire hunters to kill snow leopard for livestock depredation, which has reduced due to security concern. But in Gurez-Tilel which is close to LoC, construction of military bunkers and other infrastructure have disturbed the snow leopard habitat resulting in decline of snow leopard. The major land use practices in and around these habitats include the livestock grazing, fodder collection and agriculture.

**Objectives:** The purpose of the project was to establish the baseline about the status and distribution of snow leopard and its prey and understand the threats they face. There is

currently no documented information about the status and distribution of snow leopard in Kashmir. Except Kajiinag, we also have no baseline information available for snow leopard prey in Kashmir. This study will fill the gap by establishing the baseline information. The high potential snow leopard habitats will be mapped and prioritized for conservation by involving the State Wildlife Department. The steps to curb poaching and other threats will be discussed with the Wildlife Department to initiate mitigation of such threats.

### *Study or activity site*

The current study focused on the high altitude area of Kashmir Region of the J&K State. The main valleys/areas to be covered included Pirpanjal (Banihal pass-Gulmarg), Kajiinag-Shamshabari, Gurez-Tilel Valley, Sindh Valley Brengi Valley Lidder Valley. The Greater Himalaya covers Kashmir from south to north while the Pirpanjal covers it from south to west (Figure 1). The Lidder Valley and Sindh Valley are adjacent to each other and are connected, so are the Sindh and Gurez-Tilel Valley They are important catchments of three important nullah/rivers viz, *Lidder*, *Sindh* and Kishenganga. Kishenganga Valley is the vast valley and is actually a part of the Neelam Valley. Kishganga River separates the Neelam and Kishenganga valleys. The Kajiinag consists of Shamshabari and Kazinag mountain areas which are contiguous and form the important habitat for markhor. They are separated from the main Pirpanjal (Banihal pass-Gulmarg) by River Jhelum.

The current study was the initial phase where we undertook the extensive surveys in the entire landscape largely based on interviews from key informants with a few select areas to collect information through direct surveys to assess the status of the snow leopard and its prey species. Based on the outputs of the current study 3 potential snow

leopard sites have been identified to be focused for future research and conservation action.

## **Methods**

Methods such as transect surveys, camera-traps and non-invasive genetic sampling may not be practical for monitoring wildlife status over large areas within a limited time period and budget (Jackson et al., 2006, McCarthy et al., 2008, Sharma et al., 2014). We therefore started with secondary data collection through interviews. We divided the study area into forest ranges and went to every range to interview the knowledgeable people such as pastoralists (gujjars and Bakkarwals), shepherds using these ranges. For migratory herders we mainly interviewed them at their entry to Kashmir (early summer) and while they leave Kashmir (early autumn). We also went to the alpine and subalpine pastures in many areas to interview these herders. The study area was divided broadly into recognised sites/valleys such as Lidder valley, Bringi Valley, Gurez-Tilel valley. These sites were further divided into forest ranges and went to every range to interview the knowledgeable people such as pastoralists (gujjars and Bakkarwals), shepherds using these ranges. Migratory herders were also interviewed at their entry to Kashmir (early summer) and while they leave Kashmir (early autumn). Key informants were interviewed from villages around each forest range. In almost every village we searched for old hunters, shepherds and other knowledgeable people who have knowledge of the area and its wildlife. The reliability of the interviewees' knowledge was cross-checked by their identification of snow leopard pictures and a brief interaction with them. Data gathered from key informants included information of sightings or records of the species before insurgency (around 1988-89 as most of people here remember this date and refer to it usually) and current (2015-16). At least ten respondents were interviewed per range. Direct sightings, hunting reports and livestock depredation incidents were regarded as the strong evidence of snow leopard presence.

Direct sightings and hunting reports were taken as the strong evidence of presence of the prey species.

Since the data gathered from informants was from two time periods, we thus included questions that indicated perceived population trends of the species from the past to the current. The major reasons/factors for any negative change in population were discussed. The causes for change (if any) in the frequency sightings/hunting reports or the livestock depredation with the similar effort during the two defined periods were inquired and discussed. We assessed threats to the snow leopard and its prey by collating information based on direct observations, speaking with key informants and personnel from the Forest and Wildlife Departments posted in the region.

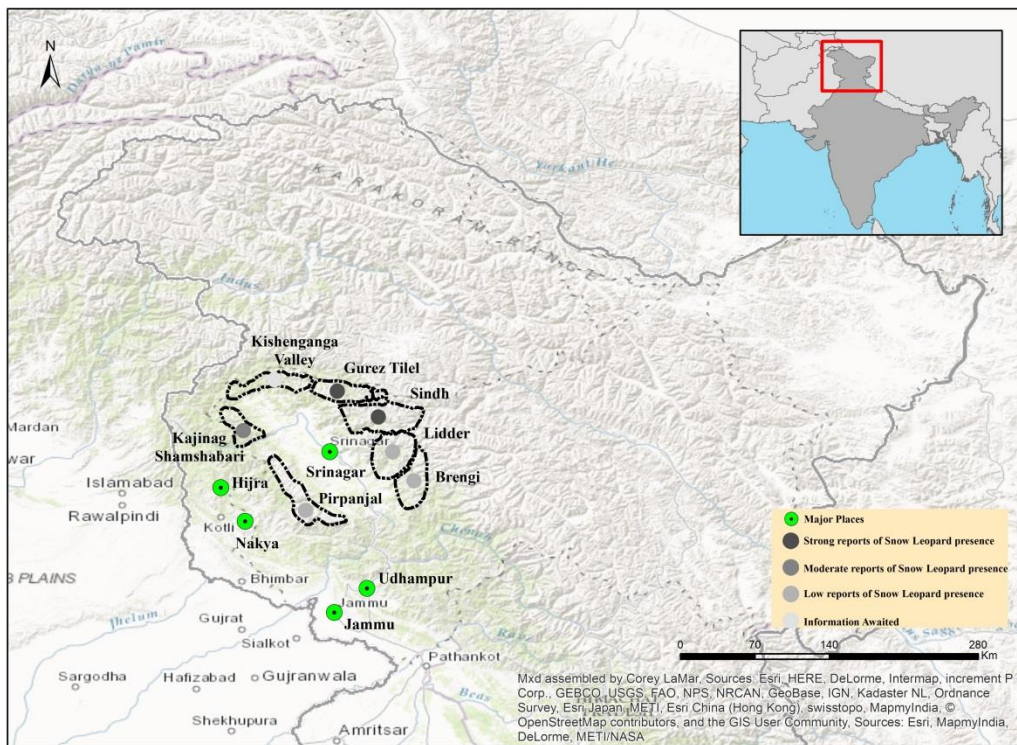
The presence of snow leopard and its prey was established when there were strong reports of presence of snow leopard and its prey. Decline or increase of snow leopard and its prey was considered when the same interviewee with the same effort indicated such a change. The reasons behind such a change was discussed with the interviewee. We inquired and discussed the major threats with the informants in the areas where declining trend of snow leopard was reported. The major threats have been listed according to their seriousness. On the basis of these results, areas/valleys with the strong reports are marked accordingly for the future action.

## **Results**

We conducted a total of 137 interviews across the 20 forest ranges and 12 divisions in Pirpanjal, Kajiinag, Kishenganga, Gurez-Tilel, Sindh, Lidder and Brengi areas of Kashmir. The interviewee included 52 migratory herders, 37 hunters, 28 shepherds, and 20 others (locals and forest officials), aged between 30-95 years. Three of the ranges

could not be surveyed because of the unrest. We however, interviewed the migratory herders who have been using these areas. The strong reports of snow leopard presence came from Gurez-Tilel and Sindh areas whereas moderate reports were from Kajinag-Shamshabari (Figure 1). We reported ibex, musk deer and marmot as main prey species for snow leopard in Gurez-Tilel and Sindh whereas it is markhor and musk deer in Kajinag-Shamshabari.

Figure 1. Map showing distribution of snow leopard in Kashmir





The major threats to snow leopard included retaliatory killings for livestock depredation, poaching and habitat fragmentation. The prey species ibex and markhor are poached for meat and trophy whereas musk deer is poached for musk. The livestock grazing and disturbance through herding dogs also is a threat especially to the prey species. Some herders many a times get involved in retaliatory killings and poaching. Poaching is high in the areas outside protected area network such as Gurez-Tilel.

The insurgency has played contrasting roles depending on the location of the area. In Sindh area where shepherds used to hire hunters to snow leopard in retaliation, such retaliatory killings stopped for quite some time as hunters were not allowed to take arms with them due to security reasons. But areas such as Gurez-Tilel which are close to LoC, construction of bunkers and other disturbance along the snow leopard habitat have impacted the snow leopard negatively.

These areas especially the Gurez-Tilel are on low priority as far as the wildlife research and conservation is concerned. The current study highlights the importance of these areas and the prevailing threats thereof. This information will be provided to Wildlife Department and other Wildlife NGOs working in the State to save the important wildlife species such as snow leopard and its prey on priority.

## **Discussion**

The presence of snow leopard was for the first time documented from Kashmir region of the J&K State. Our results show that the Gurez-Tilel and Sindh are the snow leopard strongholds whereas Kajiinag-Shamshabari is a potential area. Ibex, markhor, musk deer and marmot form the major prey species. Both the areas (Gurez-Tilel and Sindh) are contiguous to one of the snow leopard hot spots – The Trans-Himalayas which makes them crucial for snow leopard conservation. Most of the potential habitat falls

outside Protected Area Network, which makes these species more vulnerable to poaching and retaliatory killings.

The insurgency in Kashmir has played contrasting roles depending on the site location. In Sindh, shepherds used to hire hunters for killing of snow leopard in retaliation of depredation of livestock (sheep), such killings stopped for quite some time due to security concern as the hunters could not go to these areas with the gun. But in Gurez-Tilel area, the closeness to LoC has resulted in disturbance due to the construction of military bunkers, destroying the critical habitats of the snow leopard. Gurez-Tilel also completely lacks the presence of Wildlife Department and has been a hub for poaching, declining the prey also. However, Wildlife Department is planning to bring some area in Gurez-Tilel under PA Network now and this study will help them in prioritizing the area for conservation.

We have identified the three sites which need immediate focus towards conserving snow leopard and its habitat. Wildlife Department has to be informed and involved in protecting these high potential snow leopard sites and first PA for snow leopard in Kashmir can be proposed. The camera trap and foot surveys are required to estimate the population of snow leopard and its prey in the identified sites. Conservation measures have to be initiated to control the poaching and retaliatory killings. The critical sites of snow leopard and its prey need to be released from the disturbance. Awareness programmes among major stake holders such as locals, shepherds, pastoralists, students and security forces regarding the importance of conservation of snow leopard need to be taken up immediately. Such programmes can be organized with the help of Wildlife Department, wildlife NGO's and Universities.

## **Acknowledgements:**

We thank the Department of Forests for their support and co-operation to conduct this study in the entire valley. We would like to thank Department of Wildlife Protection for their co-operation and support. Thanks are due to Dr. Jagdish Kishwan, Mr. A.K. Singh. Mr. Suresh Chugh, Dr. Rahul Kaul. Dr. Yash Veer Bhatnagar, Mr. Nisar Darzi, Mr. Rashid Naqash, Mr. Koustubh Sharma, Mr. Neeraj Sharma for their kind support and guidance. We are grateful to Mr. Irfan Shah, Mr. Rauf Zargar, Mr. Intesar Suhail, Mr. Maqbool Baba, Mr. Sadiq Mir to support us during the field visits in Pirpanjal, Jhelum valley, North Kashmir and Sindh . We thank the field staff of Forest and Wildlife Departments to help us in their areas of posting especially Pirpanjal, Jhelum Valley, north Kashmir and Sindh. We thank all the interviewee for giving their precious time and valuable information. Thanks are due to Poonam Chandel for helping with the map.

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