

# STATUS OF SNOW LEOPARD (*UNCIA UNCIA*) IN HUMLA DISTRICT, WESTERN NEPAL

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**Abstract:** This study was carried out in the Humla District, West Nepal during April - May 2007. The Snow Leopard Information Management System, SLIMS (second order survey technique) developed by International Snow Leopard Trust was used to determine the status of snow leopard in the area. Altogether, 13 transects (total length of 6.76 km) were laid down in the major two blocks of Humla. A total of 45 snow leopard's Signs (32 scrapes, 11 feces, 1 urine mark and 1 pugmark) were recorded. Fixed-point count from method was used for blue sheep survey from appropriate vantage points. Interviews were conducted to find out relevant information on livestock depredation patterns and locals perception towards snow leopard. Out of 12 households surveyed in the area, 60% of herders lost livestock due to snow leopards. A total of 16 animals were reportedly lost due to snow leopards in 2007. High retaliatory killing and poaching are the major threat to the species in the area. Therefore, long-run survival of the species seems uncertain in the area. Habitat disturbance and over grazing have disturbed the prey species and ultimate impact on snow leopard. More awareness and income generation programs are needed to make the locals aware about the role of predator in the ecosystem.

**Key words:** Snow leopard; Prey species; Status; Humla; Conflict.

## INTRODUCTION

The Snow Leopard (*Uncia uncia*) is an endangered species lives in the mountains of the Central Asia and the Himalayas, often in very high altitudes with extremely low winter temperatures and far away from sheltering forests (Nowel and Jackson, 1996). In Nepal it inhabits the main Himalayan chain along the Tibetan border (HMG Nepal 2005). It is widely but thinly distributed throughout its range in the mountains of Central Asia (Hussain 2003). The snow leopard is an endangered species in IUCN Red List of threatened species since 1988 (IUCN 2002) and is included in Appendix I of the Convention on International Trade in Endangered Species of Fauna and Flora (CITES) since 1975, and hence all international commercial trade in the species, its parts and derivatives is prohibited (McCarthy and Chapron 2003). They are one of the least known of the large cats, due in large part to the remote and rugged habitat of the central Asian mountains where they occur (McCarthy 2005). Jackson and Ahlborn (1990) concluded that 65% of this snow leopard population was located outside of Nepal's protected areas; thus, landscape conservation becomes an important strategy. Such conservation measures should take into account creating dispersal corridors and maintaining an adequate prey base that can support a large snow leopard population. But high density of snow leopard populations are known from

Nepal's northwestern region, especially in Dolpo, Humla, Mugu, Manang, Mustang, and Myagdi Districts (HMG 2005). Jackson and Ahlborn (1989) reported a density of at least 5-10 snow leopards per 100 km<sup>2</sup> in the Langu Valley, in western Nepal, indicative of a larger population relative to the other areas. Similarly, presence of the species has been confirmed from Langtang National Park (Khatiwada 2004 and Chalise *et al.* 2005). The Snow Leopard Action Strategy for the Himalayan Region (WWF 2006) also clearly indicated the importance of the western population of snow leopard, conservation actions-especially community-based monitoring and conflict mitigation should be adopted because of livestock depredation (either real or as a perceived threat) and for the commercial trade. Retaliatory killing has become a major cause of snow leopard deaths. We report here on study carried out during March-April 2008 to assess the conservation status and distribution of the Snow leopard and its prey species, and identify the existing threats to their existence in the Humla district.

## MATERIALS & METHODS

### Study Area

Humla is a very remote district of Mid-West Nepal in the north-west corner of the country bordering Tibet. It is the country's second largest district and ranges in altitude from 1,500-7,300

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metres. The district headquarter is Simikot (2,950m), 10 days walk from the nearest motor road in Nepal and 6-7 days walk from the road head over the Tibetan border at Sera (near Hilsa). In a composite index of development, Humla district ranked 4th from worst off. In recent years the area has suffered from severe food deficits and occasionally disease epidemics. Due to the mountainous terrain, only 1% of land is available for agriculture and the average land holding size is 0.52 hectares per household. More than 50% of the land is at a slope of more than 30 degrees. Much of north Humla is snow covered or extremely cold for 5 months of the year. 24% of land cover is high altitude pasture, which accounts for the importance of livestock in the farming system, particularly yaks and local yak-cow cross (Saville 2001).

### Method

The study was conducted during the months of April and May in different areas of Humla District. Using the SLIMS protocol, snow leopard sign surveys were conducted. Transect routes were plotted on available 1:50,000 topographical maps, and placed along land forms where snow leopard signs are most likely to be found, such as on ridge lines, cliff base and river bluffs ( Bajimaya 2001, McCarthy 2000, Jackson and Hunter 1996). Transects route were short and ran along landform edges. All transects were walked by a pair of observers and all signs were recorded using the Snow Leopard Information Management System (SLIMS) methodology. Fixed point counts survey of blue sheep was carried out from ridgeline vantage points using the methods detailed by Jackson and Hunter (1996). Survey blocks were outlined on maps. Each block was scanned and all sheep counted and assigned to sex and age classes when possible. The questionnaire survey was conducted in local villages in the survey area in order to evaluate the level of human-snow leopard conflict, record damage estimates from livestock depredation and record land use practices such as grazing and overall usage of pasturelands.

## RESULTS

### Status and Sign Abundance of Snow leopard

A total of 13 transects with a total length of 6.76 km (with mean length of 0.52 km ranging from 450 to 700m) were laid in the area. The overall snow leopard sign encounter rate was

(6.65 signs/km). The individual sign encounter rate were 4.73 per km for scrape, 1.63 per km for scat and 0.15 per km for pugmark and urine mark respectively (Table 1).

The area between Hilsa to Til, is relatively less disturbed and has less poaching intensity as compared to Yari and Muchu. The tourist pressure in Yari to Hilsa area is higher than Til. The snow leopard signs were recorded only from 9 transects. 34 Sign sites (both relic and non relic) were identified and 45 sign were recorded. Individual signs such as 32 (71%) scrapes, 11(25% feces, 1(2%) pugmark, 1(2%) urine mark (Fig. 1) were recorded within the total searched transects. Out of 34 sign sites 32% relic and 68% non-relic sign types were recorded (Table 2). Ages of signs were found to be 62% old, 31% fresh and 7% very fresh.

### Prey Species Survey

The major prey species of the snow leopard in Humla is Blue sheep *Pseudois nayaur*. A total of 145 Blue sheep from 6 different herds were recorded from the area. This comprised 29% adult female, 17% lamb, 11% yearling, 8% young male, 6% sub-adult male, 11% adult male and 18% were unidentified blue sheep. The average group size was 31.66. In addition, the Himalayan tahr *Hemitragus jemlahicus* is also reported to be found in the Yari and Muchu area. Other prey species present in the area are marmot, goral, musk deer, pika and other small rodents, Impeyan pheasant, Tibetan snowcock, snow partridge and chukar partridge (Table 3).

### Human- snow leopard interaction

A total of 19 households were survey in the areas of Til, Hilsa and Muchu. The animal husbandry is the major source of

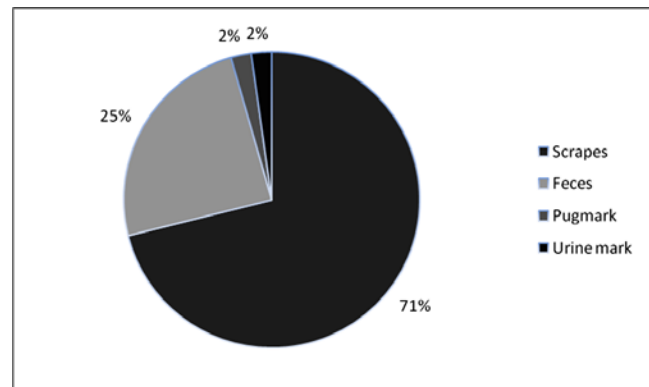


Fig. 1: Occurrence of sign of snow leopard in Humla

Table 1: Sign encounter rate of snow leopard in Humla

Locations	Transects (Length in Km)			Site		Total signs		Scrapes	
	Number	Total	Mean	Number	Site/km	Number	Sign/km	Number	Scrapes/km
Yari to Hilsa	5	2.55	0.51	8	3.14	14	5.49	10	3.92
Til	8	4.21	0.52	26	6.2	31	7.36	22	5.23

Table 2: Characteristics of the snow leopard signs in Humla district

**Table 3:** Population structure of blue sheep in Hilsa and Til areas of Humla

Place/Block	Adult Female	Lamb	Yearling	Young Male	Sub-adult male	Adult male	Unidentified	Total
Hilsa	9	4	3	1	4	2	3	26
Near Hilsa way to Til	8	0	4	0	3	0	5	20
Mane peme	5	2	3	0	0	0	4	14
Lamka	7	4	2	3	1	2	3	22
Near Til monastery	13	5	6	2	5	2	4	37
Way to Halji	5	2	0	0	0	2	0	9
Til	6	3	1	0	3	1	4	18
Total	53	20	19	6	16	9	23	146

economy of the local people living in Humla bordering to China, Tibet. The major livestock owned by the local people (farmers) of the Til, Yari and Muchu are Yak, Sheep, Horse and Goat. The survey results revealed that the snow leopard signs were more above the 3800 m which showed the availability of the snow leopard in the higher areas where the prey species live. These areas are the major grazing places of livestock. Interview with the local people indicated that mortality of the livestock was caused by different sources that are predator, lack of forage, winter snow/cold, disease and accident. Among the total lost, the highest mortality was caused by the predator (60%). There were 16 head of livestock were killed by snow leopard in the year 2007 from the Til and Muchu areas. The sub-adults yak, sheep and goat were most vulnerable to wards snow leopard and other carnivores' (for example; Wolf, Jackal, Fox and Dhole) predation.

## DISCUSSIONS

Highly cryptic coloration, sedentary behavior, mostly solitary behavior and sparse distribution in far flung and generally inaccessible mountain range make the survey of Snow Leopard extremely difficulty (Malik 1995). So, the direct census of the Snow Leopard is very difficult to estimate the population status. Sign survey is employed to estimate the relative abundance, habitat and distribution of the Snow Leopard (Hussain 2003 and Ale *et al.* 2007). Out of the 13 transects conducted, signs were recorded from 9 transects only which is 69.24% of the total transects plotted. Shah and Thapa (2007) recorded 18%, 60% and 57% of the total transects yielding the signs in Langtang National Park, Kangchenjunga Conservation Area and Langu valley respectively. The percentage of transects yielding for the signs of snow leopard is higher in the present study.

The anecdotal survey revealed the presence of snow leopard in Til, Yari, Hilsa, Muchu, Manepeme, Lamka, Halji, Thadodhunga and Sipsip area. The abundance of snow leopard signs (5.49/km) in Yari to Hilsa, which is disturbed, was lower as compared to Til (7.36/km), which is relatively undisturbed. Hussain (2003) also reported that abundance of snow leopard is related with human disturbances. The present study revealed that scrape is the major sign encountered in the study area which covered 71.1% followed by feces 24.4%. McCarthy

and Mukhtsag (1995) recorded 933 Scrapes, 623 fecal piles and 62 scent sprays in Mangolia. Similar result was noted by Ale *et al.* (2007) which reported 59.93% scrapes, 32.14% feces, 1.79% hair, 3.57% pugmark and 3.57% of scent mark in Sagarmatha National Park. The overall sign encounter rate in the study area was 6.65signs/km with 5.03 sign sites/km. The encounter rate for scrape and scat were 4.73 scrapes/km and 1.63 scats/km respectively. Shah and Thapa (2007) reported 6.08 signs/km, 3.80 sign sites/km and 4.56 scrapes/km from Kangchenjunga Conservation Area and the Dolpa region of Shey-Phoksundo National Park (7.39 sign sites/km, 12.66 sign items/km and 7.71 scrapes/km) by Thapa (2006). The area like Til, Yari, Hilsa and Muchu, Manepeme, Lamka, Halji, Thadodhunga, Sipsip are the major grazing area of the livestock. These above mentioned areas also favored the habitat of Blue sheep is the major prey species of snow leopard in Nepal Himalaya (Jackson 1995). High diet overlaps between livestock and blue sheep, together with density-dependent forage limitation, results in resource competition and a decline in blue sheep density (Mishra *et al.* 2004). In turn such reduction of wild prey often leads snow leopard to prey on domestic livestock.

Livestock, due to their reduced escape capabilities compared to wild herbivores, become especially vulnerable for the predation (Nowell and Jackson 1996). The study revealed that 60% of the livestock lost is because of the predation by the snow leopard. Khatiwada (2004) reported the actual loss of livestock by predator (62%) in Langtang National Park, Nepal. A similar pattern was noted by Jackson *et al.* (1990) from Annapurna conservation Area; estimate the depredation rate 19.6% and Oil (1991) estimated the depredation rate 2.6% from Manang Area, Nepal. Similarly, there were incidents of depredation from Dhole (*Chengu* in local dialect) and wolf (*Fara* in local dialect). The snow leopard population has been declining from the Til area of Humla district due to poaching and retaliatory killings. Hilsa which is located at the Sino-Nepali border is the major trade market of wildlife parts and products. Poachers can easily smuggle the wildlife parts to Taklakot (Tibet/China) which is one of the most important trade center for wildlife parts. Four Nepalese poachers are serving the sentence in Taklakot for being involved in illegal wildlife trade (Pasang Lama, Pers. Comm). The areas like Halji, Til, Jang and



Dojama are potential habitat for the snow leopard and prey species but the status is still unknown.

## CONCLUSION

The survey result revealed that the Humla district strongly holds the potential area of snow leopard. Increased poaching, habitat disturbances, overgrazing and negative attitude of locals towards snow leopard are serious concerns on snow leopard and its prey species conservation in this area. Therefore, further strengthening of the local people through proper training and economic incentives, creating conservation awareness to all villagers including the herders, to make presence of wildlife conservation Act in the area and strong regulation on livestock grazing and use of natural resources are a few immediate steps to be taken for the wellbeing of the elusive snow leopard in the areas. Lack of knowledge in the conservation issues and negative attitude of locals towards snow leopards are the major threats for the survival of the snow leopards in the area.

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