

STATUS REPORT ON SNOW LEOPARD IN INDIA

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The snow leopard *Panthera uncia* has attracted considerable conservation interest and effort over the past few years. Despite this interest, the conservation status of the species still remains Insecure in the wild. We are not yet in a position to understand its biology or fully manage and protect the cat or its habitat. Our knowledge of its present day range remains incomplete.

The species has an extensive range in Central Asia, from Afghanistan in the west to China in the east. India has a relatively small proportion of this total range, but the enormous extent of the Himalayan mountains (3,000 km plus) in which the snow leopard finds its southern limits, means that the Indian ranges are of considerable importance to the overall conservation effort.

Michael Green (1982) wrote a brief review of the status of the snow leopard in north and northwest India. It is useful to update his report and add information for eastern India. In 1985 the Government of India, in collaboration with the U.S. Fish and Wildlife Service and the International Snow Leopard Trust, approved an initial survey of potential snow leopard areas in northern and northwestern India. The Wildlife Institute of India undertook the survey, from which some detailed information is being presented in this symposium.

Greater conservation awareness in India and the creation of increasingly effective Wildlife Wings in the States have led to increased data on the snow leopard and its habitat. Information from state sources and from a few detailed studies of protected areas, such as those of Nanda Devi (Tak & Kumar, 1983) for the Man and the Biosphere Committee have added to the knowledge of distribution patterns.

Green (1982) mentioned the problems of obtaining hard factual information on the snow leopard. Because we are dealing with a shy, well-camouflaged animal which naturally exists at very low densities in extremely rugged and arduous and often inaccessible areas, sightings are understandably few. Many observers are not skilled wildlifers, and there is always the strong possibility of misidentifying common leopard. What can one conclude from a single sighting? Certainly nothing on population status and well being; but actual presence is still confirmed.

This problem of information is not restricted to the species itself. There is still a lack of quantitative information on the available prey species and on limiting factors which serve to reduce snow leopard density, such as poaching, domestic stock grazing and general ill-

This report presents information on the major biogeographical areas of the Indian Himalayas: the Trans-Himalayas (cold desert of Ladakh & Lahul-Spiti), the northwest Himalayas (Jammu & Kashmir, eastwards to the Sutlej), the west (from the Sutlej to Nepal), the central (West Bengal & Sikkim) and the east (Arunachal Pradesh). Within these areas, data is given on snow leopard presence and broad information on their habitats.

DISTRIBUTION OF SNOW LEOPARD IN INDIA

This section summarizes information compiled from Wildlife Institute of India surveys, reports from state chief wildlife wardens and from published reports and papers. The snow leopard still maintains a wide ranging but sparse presence all along the Himalayas. They occur throughout the Trans-Himalayan area, and probably above 3,400m in the main Himalayan ranges. The upper limit for snow leopard presence, apart from occasional forays may be 5,500m.

Trans-Himalaya

This is the area from where fairly good information is available on the distribution of the species, much of which was summarized by Mallon (1984). Ladakh, Lahul and Spiti which cover almost all the Trans-Himalaya area have a wide range of recent sightings of snow leopard. Snow leopard and their kills have been seen in Upper Suru valley, Zaskar, Lughak nala and Markha valley in Central Ladakh. Its presence has also been established in the Nubra and Changthang area of Ladakh mainly based on the reports of kills by snow leopard on domestic stock.

There is less information from Lahul-Spiti in Himachal Pradesh but snow leopards do occur, as sightings have been reported on occasions within the last five years.

The narrow fringes of Trans-Himalayan habitat in northern Uttar Pradesh, Sikkim and Arunachal Pradesh also have a snow leopard presence.

Northwest Himalaya

The snow leopard has been sighted in several areas in western Himachal Pradesh in recent years, including the new Great Himalayan National Park (Kulu), Manali, Solangnala, and Deotiba. Whilst there have been no recent confirmed reports from Dachigam National Park in Jammu and Kashmir, it is reported from adjoining areas proposed as the Dachigam extension.

Western Himalaya

Its presence has been reported from several places in all of the main Himalayan ranges. Recent sightings come from Govtnd Pashu Vihar Sanctuary, Nanda Devi National Park and Kedarnath Sanctuary in Uttar Pradesh. Little is known about its presence in the portion of Himachal Pradesh to the east of the Sutlej river.

Central and Eastern Himalaya

Snow leopard habitat in Sikkim and Arunachal Pradesh is comparatively smaller but these are probably the most secure areas, the level of sheep and goat raising being very low. Bulk of the habitat, therefore, is available to snow leopard and its prey. Unfortunately very little factual information is available from these areas. However, snow leopard presence has been confirmed from northwest Sikkim (S. M. All. 1981) and from the Kangchengdzonga National Park in Sikkim. The presence of snow leopard has also been confirmed from the Namdapha National Park in the extreme east of Arunachal Pradesh. Beyond this there is little information from eastern India.

STATUS AND CONSERVATION

Discussion of the status of snow leopard populations must await more detailed long-term study of individual areas. Wildlife Institute of India snow leopard survey team personnel will be reporting on their findings from study areas in Central Ladakh during this symposium (this volume).

We are aware however of the fact that snow leopard exist at very low density and that virtually all of our protected areas are too small to contain anything approaching viable populations. We are aware of the pressure of increasing human population on the habitat of the snow leopard. Increasing numbers of graziers use the already heavily used pastures, even within many of our protected areas; their livestock compete with wild prey populations for scarce forage, and the prey species themselves may be poached. Snow leopard and their prey frequently have to move to lower elevations in winter; increasing human population is using these areas, forcing wildlife to remain in less suitable habitats. We know there is still some trade in skins. With all these pressures in mind, we must conclude that conservation status is inadequate. However many of these limiting factors are not permanent, and this position can be reversed, given political and professional motivation.

It is only in a few protected areas where one can now see signs of habitat recovery and population increase. This is occurring in areas like Dachigam (J. & K.), Govind Pashu Vihar, Nanda Devi, Kedarnath (U.P.), Kang-Chendzonga N.P. (Sikkim) and Namdapha (Arunachal Pradesh). But snow leopard habitat in the existing protected areas is not enough, hence the enlargement of the existing protected areas and establishment of new protected areas is urgently needed in conjunction with upgrading of management practices in protected areas. India has already shown by the success of Project Tiger that she has the ability to implement such major conservation schemes.

Table I shows the approximate areas of broad habitat types in the upper Himalayas. We made some rule of thumb assumptions as to what may be available for snow leopards and the result is an encouraging 95,000 sq km. We are aware of the limitations of such data but they do serve to show the rough size of potential habitat!

Increasing pressures on even the high Himalayas means that these remote regions cannot offer sanctuary to our wildlife without special protective measures. Tables II and III illustrate the extent of existing protected areas in the states and biogeographic zones of the Himalayas, as well as proposals for further sanctuaries and national parks. It is obvious that the existing size of the protected areas is small. (Table II shows an average size of under 500 sq km.) However new proposals for Ladakh, the newly created Great Himalayan National Park in Himachal and plans for Arunachal serve to indicate that it is still possible to gazette sizeable areas.

We can ask the question, "Is this enough?" We do not yet know the answer, but almost certainly the protected area network will need revision and fine tuning for a long time to come. Boundaries may have to be extended to allow seasonal descent to lower altitudes, corridors between close-by areas may be needed and sanctuaries may need greater protection for core areas.

Organized poaching perhaps no longer poses such a great threat to the snow leopard as their low densities, elusiveness and inaccessibility make this an extremely difficult task. Generally snow leopards are only killed to protect domestic stock, a relatively easy practice as the leopard remains in the vicinity of the kill for a long time.

Grazing pressure is the major threat to the snow leopard and the prey populations. This is not so much from the scattered settlements of resident people, but the ever increasing numbers of migratory graziers using the alpine pastures. Many resident people are

<i>State/ Union Territory</i>	<i>Subalpine Forest</i>	<i>Moist Alpine Scrub</i>	<i>Dry Alpine Scrub</i>	<i>Glacier*</i>	<i>Barren Land</i>	<i>Total</i>
<i>Arunachal Pradesh</i>	<i>11,200</i>	<i>5,600</i>			<i>11,700</i>	<i>28,500</i>
<i>Sikkim</i>	<i>950</i>	<i>500</i>	<i>110</i>		<i>3,000</i>	<i>4,560</i>
<i>West Bengal</i>	<i>150</i>					<i>150</i>
<i>Uttar Pradesh</i>	<i>1,100</i>	<i>1,750</i>	<i>950</i>	<i>1,800</i>	<i>10,200</i>	<i>15,800</i>
<i>Himachal Pradesh</i>	<i>1,300</i>	<i>1,000</i>	<i>1,700</i>	<i>150</i>	<i>20,850</i>	<i>25,000</i>
<i>Jammu & Kashmir</i>	<i>2,900</i>	<i>2,200</i>	<i>3,700</i>	<i>2,900</i>	<i>123,100</i>	<i>134,800</i>
<i>Total</i>	<i>14,700</i>	<i>11,050</i>	<i>6,460</i>	<i>4,850</i>	<i>168,500</i>	<i>208,810</i>
<i>Proportion and Total Assumed Potential Snow Leopard Habitat</i>	<i>0.3</i>	<i>0.5</i>	<i>0.5</i>	<i>0.0</i>	<i>0.5</i>	<i>97,905</i>
	<i>4,900</i>	<i>5,525</i>	<i>3,230</i>	<i>0</i>	<i>84,250</i>	

** Estimate; may be subject to considerable fluctuations.*

Habitat types are measured from 1: 2 million map sheets in the Forest Atlas of India. Mapping at this scale is subject to considerable error. The category "Barren Land" consists of open meadow, scree, rock etc. It is probable that some 1/3 of the sub-alpine habitat could be available to snow leopard in winter, that up to 1/2 of the alpine scrub could be available, none of the glacier, and 1/2 of the barren land, assuming much of it to be above 5,500m.

Table 2. Distribution of protected areas within High Altitude Regions of India

<i>Biological Province Protected of Alpine Biomes</i>	<i>Approximate Area (sq km) of Temperate</i>	<i>Existing Area &</i>	<i>Total* Size (sq km)</i>	<i>Proposed and Existing Protected % Area Total Province</i>	<i>Total* Size (sq km)</i>	<i>Proposed Protected Area as a of</i>
<i>Ladakh</i>	<i>102,000</i>	<i>2</i>	<i>800</i>	<i>;</i>	<i>11,540</i>	<i>11.3</i>
<i>N.W. Himalaya</i>	<i>50,000</i>	<i>16</i>	<i>3,837</i>	<i>18</i>	<i>4,537</i>	<i>9.1</i>
<i>W. Himalaya</i>	<i>50,000</i>	<i>12</i>	<i>3,075</i>	<i>i</i>	<i>4,199</i>	<i>8.4</i>
<i>C. Himalaya</i>	<i>16,000</i>	<i>7</i>	<i>1,121</i>	<i>10</i>	<i>2,197</i>	<i>7.0</i>
<i>E. Himalaya</i>	<i>50,000</i>	<i>3</i>	<i>2,712</i>	<i>15</i>	<i>9,200</i>	<i>18.4</i>

This includes complete protected area sizes, even portions below 2,500m. As a rule of thumb, subtract one quarter to give a closer approximation of temperate and alpine and snow and ice areas.

In general, when high altitude areas are not specifically described in terms of major habitats, they are assumed to be 50% split between temperate and alpine zones.

Buddhists, with traditional and religious customs prohibiting killing of wildlife. The newcomers unfortunately often do not have the same sanctity for wild animals, and they do hunt.

These problems of human pressures will not be solved by legislating protected areas alone. Major educational and eco-development programs will be needed to solve the people's own problems of existence as well as those of wildlife.

CONCLUSION

This report suggests that whereas conservation status for the snow leopard is still far from secure, measures are being taken to improve the situation. State authorities are increasingly taking an interest in conservation matters, new protected areas are being declared, legislation is slowly reducing ways to utilize poached products and the Wildlife Institute of India is developing an indigenous research and survey capability.

More input is still needed. Our ability to determine snow leopard status will, for a long time to come, depend on observation by non-professionals, mountaineers and trekkers and the armed services who patrol these mountain areas. The army is introducing its own wildlife training program and we look forward to an ever increasing flow of natural history observations and conservation proposals.

Finally let us state that although we have had to repeat what Michael Green said in 1982 about problems of snow leopard information, we believe we can now confidently say India has laid the groundwork to ensure that both our understanding and our conservation efforts will greatly improve. Just as the tiger spear-headed the conservation efforts in lowland India through Project Tiger, it is our earnest hope that the snow leopard will act as the focal point for conservation efforts in the high Himalayas. Perhaps we need an "Operation Snow Leopard."

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