Snow Leopard Survival Strategy Summary Version

Editor: David P. Mallon

Adapted from full version by Thomas M. McCarthy and Guillaume Chapron



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International Snow Leopard Trust & Snow Leopard Network

Seattle, USA

Editor: David P. Mallon

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Foreword

The range of *Panthera uncia* encompasses diverse habitats: some of the driest mountains in the world, the open coniferous forests of the Tian Shan and Altai and up to 5500m on the Tibetan Plateau. Yet the snow leopard does not live in in a wilderness untouched by man. Within snow leopard range we find some of the oldest of the world's civilizations. From Central Asia, snow leopards have seen horsemen setting out to conquer the world throughout history. Snow leopards have shared their living space with humans for many thousand years and they have become part of these peoples' cultures. As far as we know, their range has not changed much over the centuries and it is today protected by law in all twelve range countries.

Yet the future survival of this animal is not guaranteed and it is listed in the IUCN Red List as Endangered. The SLSS is based on the best available knowledge and modern conservation strategies. It identifies the most pressing needs for additional information and describes the required methods to gain this knowledge. It considers ecology, trade, socio-economic and policy aspects and provides guidelines for drafting country action plans.

The Snow Leopard Network and the SLSS became possible in part due to far-reaching political changes at the end of the 20th century, allowing all people involved in snow leopard conservation to come together, work cooperatively, and exchange experiences and ideas. These changes also bear some risks. The range countries will experience economic progress, more trade and tourism. These may bring new threats to the habitat and the prey of the snow leopard, and open new channels for illegal trade. As a consequence, very close international cooperation in conservation is urgent and documents such as the SLSS are more than needed. Everyone who reads the SLSS should be aware of the fact that that through the process of conserving the snow leopard, we are also working toward a better future for the people who share the living space with this wonderful cat of the mountains.

Urs and Chrisitne Breitenmoser, Co-Chairs, IUCN/SSC Cat Specialist Group

Acknowledgements

The Snow Leopard Survival Strategy (SLSS) is the product of the Snow Leopard Network (SLN), and of all the individuals and organisations that comprise that Network; thus it would be very difficult to name each contributor. However, several people and organisations have made notable contributions and should be acknowledged here. The SLSS process was initiated and facilitated by the International Snow Leopard Trust (ISLT) and as such benefited greatly by the wisdom of their Founder, Helen Freeman. Brad Rutherford, ISLT's Executive Director, gave a high priority to the SLSS process over a 2-year period, assuring that needed funds and staff time were available. ISLT's Board of Directors also backed the process, making special efforts to secure the additional funds needed.

After much input was gathered from snow leopard experts in the field and from all range countries, the Snow Leopard Survival Summit was convened in Seattle, USA in May 2002. This undertaking could not have been nearly as successful without the cooperation and support of the Woodland Park Zoo.

The Summit itself was a highly participatory process with sessions and workshops led by a number of experts. Numerous authors contributed to the full version of this document and/or reviewed early drafts and many organizations provided financial, material and logistical support: they are all listed in the full version, available on the SLN and ISLT websites. Tom McCarthy and Guillaume Chapron devoted a significant amount of time and effort to editing the full version of this document. Manuscript layout of this version was done by Heather Hemmingmoore.

The Snow Leopard Network came about when SLSS participants recognized the need to continue the close collaboration established up to and during the Summit. The early development and activities of SLN have been financially and motivationally supported by Charlie Knowles.

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1. Introduction

Rationale

The Snow Leopard Survival Strategy (SLSS) was undertaken to provide comprehensive guidelines for a range-wide effort to save the snow leopard. The Strategy was arrived at after analysis of the threats facing the species, conservation actions to address those threats, and determination of information needs. Area-specific action plans can be developed based on this Strategy.

Specific Goals

- Assess and prioritize threats to snow leopard survival on a geographic basis.
- Define and prioritize conservation, education, and policy measures to alleviate threats.
- Prioritize subjects for research and identify viable or preferred research methods.
- Build a network of scientists and conservationists to facilitate open dialogue and cross-border cooperation.
- Gain consensus on an SLSS document available to range states to aid conservation planning

History of the Process

In February 2001 the International Snow Leopard Trust initiated development of the SLSS. This highly participatory process started with a survey of specialists. Survey results were provided through an internet website and discussed via an email-based group. Participants numbered over 60, including 32 representatives from 12 snow leopard range states. The Snow Leopard Survival Summit was held in Seattle, USA, 21-26 May 2002, attended by 58 specialists to discuss and refine the Strategy. The end product of that process was the comprehensive SLSS document (McCarthy & Chapron 2003). This summary and partly updated version was prepared following a decision of the SLN Steering Committee in May 2006 and is available initially in English, Chinese, Mongolian and Russian.

Brief background on the snow leopard

Portions of this section are reprinted directly from Nowell and Jackson (1996), Jackson and Hunter (1996), Fox (1994), McCarthy (2000), Jackson (2002) and Theile (2003).

<u>Other names</u>: léopard des neiges (French); Schneeleopard, (German); leopardo nivai, pantera de las nieves (Spanish); xue-bao (Chinese); palang-i-barfy (Dari: Afghanistan); bharal he, barfani chita (Hindi, Urdu: India, Pakistan); shan (Ladakhi: India); hi un chituwa (Nepal); ikar (Pakistan); irbis, irvis (Central Asian republics, Mongolia); snezhniy bars (Russian); chen (Bhutan), sah, kang zig (Tibetan). <u>Description</u>: The snow leopard is whitish-grey (tinged with yellow) patterned with dark grey rosettes and spots. Adaptations for high altitude include an enlarged nasal cavity, shortened limbs (adult shoulder height is about 60 cm), well developed chest muscles, long hair with dense, woolly underfur (belly fur up to 12 cm), and a tail up to 1m long, 75-90% of head-body length (Hemmer 1972). Males are larger than females, with average weight 45-55 kg as opposed to 35-40 kg for females (Jackson 1992).

Ecology: Generally solitary, though groups of up to 6 have been reported – presumably a female with young. Mating usually occurs late January to mid-March, Gestation lasts 93-110 days, 1-5 cubs are born generally in June-July. Social markings include scrapes, feces, scent sprays and claw rakes. Occur at elevations of 3,000-4,500m, in some places 900-2,500m. Often move to lower elevations in winter. Prefer steep terrain broken by cliffs, ridges, gullies, and rocky outcrops. They show a strong preference for irregular slopes in excess of 40° and welldefined landform edges, such as ridgelines and ravines. In Nepal home range was 12-39 km², with substantial overlap between individuals and sexes. In Mongolia, home ranges of both males and females exceeded 400 km². A study in Nepal indicated that 42-60% of home-range use occurred within 14-23% of the total home area.

Most commonly taken prey consists of wild sheep and goats, but also includes pikas, hares, and game birds (Hemmer 1972, Heptner and Sludskii 1972, Schaller 1977). Predation on livestock can be significant (Schaller 1977, Mallon 1984a, Fox and Chundawat 1988, Oli 1994, Jackson *et al.* 1994).

Taxonomy: The snow leopard (Panthera uncia) is a member of the Felidae family, subfamily Pantherinae. Until recently it was considered a separate genus (Uncia) mainly because the vocal fold is less developed than in other pantherines so it cannot make the low, intense "roars" of which the other big cats are capable (Pocock 1917. Hemmer 1972). However, genetic analyses have determined the snow leopard to be clearly within the Panthera radiation (Johnson et al. 2006) and the nomenclature now reflects that. Two subspecies have been described (Stroganov 1962) but are not generally recognized. As in other Pantherinae, the diploid chromosome number is 38 and the fundamental number is 36 (Gripenberg et al. 1982). The only fossil records are upper Pleistocene remains from Altai caves (Hemmer 1972).

Distribution and Population: Snow leopards occur in 12 countries: Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan; presence in Myanmar is unconfirmed. Distributed in the high mountains of Asia: Himalaya, Karakorum, Hindu Kush, Pamir, Tien Shan, Altai, Sayan, and Kun Lun ranges and numerous smaller massifs. Large parts of the range have not been surveyed, or were surveyed 10-20 years ago. Much of the distribution is located along international borders, adding to the difficulty of field work. Distribution, ststus and protected area cover were reviewed by Jackson (2002).

The United States Geological Survey (USGS) and ISLT produced a map of potential snow leopard habitat in 1995 (Figure 1) based on geographic habitat figures, but omitting parameters such as prey, competition, and

grazing pressure. Fox (1994) estimated potential habitat at 1,835,000 km² and a global population of 4,510-7,350 snow leopards. Using GIS, Hunter and Jackson (1997) estimated potential habitat at about 3 million km², with some 6% falling within the existing or proposed network of Protected Areas. At a uniform density of one cat per 300 km² this would translate into a total population of about 10,000 individuals. Not all of this is occupied by the species because of hunting pressure, lack of prey, disturbance, presence of marginal habitat or other factors. However, there could be as many as 6,000-8,000 snow leopards, especially given densities in known "hotspots" of the order of 5-10 individuals per 100 km². A new map of snow leopard range has been developed following the Snow Leopard Survival Summit. This is knowledge-based and derived from field survey evidence and other confirmed reports.

Figures

Figure 1 portrays potential snow leopard range.

Table 1 lists snow leopard range states together with estimates of the area of habitat and latest

population estimates. Many of these are really 'guesstimates' based on partial surveys or those undertaken over a decade ago.

Figure 1: Potential Snow Leopard Range



Source: USGS and International Snow Leopard Trust

| Range State | Estimated | habitat (km ²) and source | Estimated population and source | | |
|-------------|--|---------------------------------------|-------------------------------------|---------------------------------|--|
| - | (figures in brackets are from Hunter & | | | | |
| | Jackson 1997) | | | | |
| Afghanistan | 50,000 | Fox, 1994 | ? (100-200) | Fox, 1994 (area-based estimate, | |
| _ | (117,653) | | | low density) | |
| Bhutan | 15,000 | Fox, 1994 | ? (100-200) | Fox, 1994 (area-based estimate, | |
| | (7,349) | | medium density) | | |
| China | 1,100,000 | Fox, 1994 | 2,000-2,500 | Fox, 1994 | |
| | (1,824,316) | | | | |
| India | 95,000 | Chundawat et al. 1988 | c. 500 | Fox et al. 1991 | |
| | (89,271) | | | | |
| Kazakhstan | 50 000 | Fox, 1994 | 100-110 | Zhiryakov & Baidavletov, 2002 | |
| | (71,079) | | | | |
| Kyrgyzstan | 65,800 | Koshkarev, 1989 | 300-350 Toropova et al. 2005 | | |
| | (126,162) | | | | |
| Mongolia | 103,000 | McCarthy, 2000 | McCarthy, 2000 800-1,700 McCarthy | | |
| - | (277,836) | | | | |
| (Myanmar) | - | | ? Mallon 2003; Rabinowitz 2001 | | |
| | (4,730) | | | | |
| Nepal | 30,000 | Fox, 1994 | 300-500 Jackson and Ahlborn, 1990 | | |
| _ | (27,432) | | | | |
| Pakistan | 80,000 | Fox, 1994 | 200-420 Schaller, 1976 and 1977; | | |
| | (81,016) | | Hussain, 2003 | | |
| Russia | 60,000 | WWF/RAN 2002 | 150-200 Poyarkov and Subbotin, 2002 | | |
| | (302,546) | | | | |
| Taiikistan | 100,000 | Fox, 1994 | 180-220 Muratov, 2004 | | |
| | (78,440) | | | | |
| Uzbekistan | 10.000 | Esipov in litt. 2002 | 20-50 | Esipov in litt. 2002. | |
| | (13,834) | | | | |

Table 1. Distribution and population estimates for Snow Leopard by range state

Range State Status

<u>Afghanistan:</u> There are reliable sightings from the Pamirs of the Wakhan corridor and southern Badakhshan. Local reports from the Ajar valley have not been substantiated. Current status is unknown but no doubt snow leopards have been significantly impacted by the past 20 years of war (Zahler and Graham 2001).

<u>Bhutan:</u> Distributed across much of the north of the country (Wangchuk 2004). Due to extensive forest cover, the lower elevational limit in Bhutan is probably closer to 3,800m than the 3,000-3500m typical of other parts of the Himalaya. Presence is confirmed in Jigme Dorje National Park (4,350 km²) (Jackson and Fox 1997). May occur in Bumdelling Wildlife Sanctuary.

<u>China:</u> China is potentially the single most important range state with up to 60% of the global range. Snow leopards occur in 7 provinces or autonomous regions (Qinghai, Gansu, Sichuan, Yunnan, Xinjiang and Tibet (Xizang) and Inner Mongolia (Zhang 1997). Distribution extends from the northern side of the Himalaya across the Qinghai-Tibet Plateau to the fringing ranges on the northern and eastern edges, and the Karakoram, Pamir, Tien Shan, Kun Lun and Altai systems in the west. Large parts of this

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range have not been surveyed recently or in detail. A vast reserve complex over 586,500km² in area is located on the Qinghai-Tibet Plateau, made up of Chang Tang NR (300,000 km²), Sanjiangyuan NR (158,000 km²), Kekexili NR (83,500 km²) and Arjin Shan NR (45,000 km²). To these can be added Qilian Shan NR (>20,000 km²) and a proposed new reserve in Central Kun Lun (50,000 km²), both on the northern edge of the plateau, and Qomolongma NR (33,910 km²) on the southern edge and on the the northern side of the Himalaya. However, these reserves harbor relatively few snow leopards, because of unfavorable terrain and generally low blue sheep numbers (Schaller 1998). Gansu Province: Liao and Tan (1988) listed 9 counties with snow leopards, but most or all populations having been seriously depleted. Now

populations having been seriously depleted. Now only marginally present in the Qilian Shan range along the border with Qinghai and in the Die Shan along the border with Sichuan. Extirpated from outlying ranges along the Gansu-Inner Mongolia boundary (Wang and Schaller 1996). *Qinghai Province:* Schaller et al. (1988b) estimated about 650 snow leopards within an occupied range of some 65,000 km² (an average of 1 cat per 100 km²). They occur in larger ranges the Danghe Nanshan, Shule Nanshan, and Qilian Shan; the Kunlun Shan which bisects Qinghai and terminates in the Anyemagen Shan, along with a series of small rocky massifs in the south and across the plateau.

Sichuan Province: Very little information. Liao and Tan (1988) listed 10 counties where snow leopards have been reported; surveys are urgently needed to establish current distribution and status.

Yunnan Province: Reported in the Hengduan Shan in the far north-west (Ji, 1999). Details of status and distribution are lacking, and field surveys are urgently needed.

Inner Mongolia Autonomous Region: Formerly occupied some desert ranges but are now on the verge of extinction or extinct (Wang and Schaller 1996). Transients are occasionally killed along the border with Mongolia.

Tibet Autonomous Region (TAR): Occurs widely and sporadically across the entire TAR, with a more or less continuous distribution along the northern slopes of the Himalaya, and along the larger mountain ranges which cross the Tibetan Plateau. Surveys by Schaller (1998) indicate snow leopards are scarce and localized in many areas. Jackson (1994a) reported up to 100 cats in the Qomolangma Nature Reserve (33,910 km²).

Xinjiang Autonomous Region: Schaller et al. (1988a) estimated about 750 snow leopards in 170,000 km² of suitable habitat (about 10.6% of its total area). They are found in the Tien Shan, almost to the Mongolian border, in the Altay, Baytik and Khavtag Shan complexes, in the Dzungarian Alatau, the Arjin Shan and Kun Lun ranges the Pamirs, and the Karakorum mountains. Known PAs are: Taxkorgan Reserve (14,000 km² estimated population of 50-75 leopards; Schaller et al. 1987); Arjin Shan (45,120 km²) and Tomur Feng Reserve (100 km²), which harbors fewer than 15 cats (Schaller et al. 1987). Some proposed or de facto hunting reserves in Xinjiang may harbor snow leopard.

India: Distributed along the Himalaya in 5 states: Kashmir, Himachal Pradesh, Jammu & Uttaranchal, Sikkim, and Arunachal Pradesh. Most habitat is located in Transhimalayan areas such as Ladakh. Chundawat et al. (1988) estimated potential habitat for snow leopard in India at 95,000 km², of which 72,000 km² is in Ladakh (including about 20,000 km² in disputed areas). Fox et al. (1991) estimated India's total snow leopard population at about 500, by extrapolating from an average density of 1 animal per 110km² for good habitat along the north slopes of the Himalaya (30,000 km²) and 1 per 190km² for lower quality habitat along the southern slopes (22,000 km²). Density estimates include 75-120 in the 4,100km² Hemis NP (Mallon and Bacha 1989) and 150-300 in a 15,000km² study area in Ladakh (Mallon 1991). Bhatnagar et al (2001) listed 25 protected areas, totaling 7.6% of the biogeographic zone supporting snow leopards. The largest PAs

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where presence is confirmed include Jammu and Kashmir: Hemis NP (4,100 km²); Kishtwar NP (425 km²); Himachal Pradesh: Pin Valley NP (675 km²); Great Himalayan NP (1,716 km²). *Uttaranchal*: Nanda Devi NP (630 km²); Kedarnath NP (967 km²); Govind Pashu Vihar (953 km²). Wildlife Sanctuary Sikkim: Kangchendzonga NP (850 km²) Arunachal Pradesh: Dibang Valley (2,000 km²). Snow leopards are known to occur within several other designated PAs in Ladakh but their status has not been formally confirmed. Other than surveys by Fox et al. (1988) centered in Jammu and Kashmir, there has been no systematic survey in other parts of its range within India. Bhatnagar et al. (2001) offer a regional perspective for snow leopard conservation in the Trans-Himalaya.

<u>Myanmar:</u> About 4,730 km² of potential habitat occurs on the northern border (Hunter and Jackson 1997), most of it within Hkakabo Razi NP (3,885 km²). Snow leopard tracks were seen in the area in 1930s, local hunters report sightings and killings, have a local name for snow leopard, *kangzik*, and blue sheep still occur in the area (Mallon, 2003; Rabinowitz 2001). A survey is required to verify current presence.

Mongolia: McCarthy (2000) estimated total range at 103,000 km², similar to Mallon's (1984b) estimate of 130,000 km², and Schaller's et al. (1994) estimate of 90,000 km² but substantially different from Hunter and Jackson's figure of 277,836 km². Occur along the Altai range east to about 103[°]E, isolated mountains in the Transaltai Gobi, Khangai and possibly Khovsgol, where the last snow leopards were sighted in the 1960s. Bold and Dorzhzunduy (1976) estimated a total population of 500-900 and Schaller et al. (1994) about 1,000 snow leopards. McCarthy (2000) provided a detailed range map and assessment of snow leopard status and distribution based on 328 sign transects and estimated the population at 800-1,700 individuals. Highest densities are in South Gobi, Central Transaltai, and Northern Altai, with only remnant populations in Khangai. At least 10 protected areas harbor snow leopards (McCarthy 2000), totaling about 18% of the range in Mongolia. These include: Great Gobi NP (44,190 km²); Khokh Serkh SPA (723km²); Otgontenger SPA; Tsagaan Shuvuut SPA; Turgen Uul SPA; Gobi Gurvansaikhan NP (12,716 km²); Altai Tavaan Bogd NP; and Burhan Buudai NR, Alag Khairkhan NR and Eej Uul National Monuments, together totaling 1,110 km².

<u>Nepal:</u> Potential range is about 30,000 km² with a country-wide population of 150-300 animals (Jackson 1979) and a hypothetical population of 350-500 individuals based on habitat suitability model (Jackson and Ahlborn, 1990). Hunter and Jackson estimated potential habitat at 27,432km² with 26.7% under *PA* status. Snow leopards are

distributed along the northern border with China. Largest populations occur in the west (Mustang, Mugu, Dolpo and Humla districts) (Jackson 1979). Jackson and Ahlborn (1989) reported at least 5-10 snow leopards per 100 km² in the remote Langu Valley of west Nepal. Snow leopard presence is confirmed in the following protected areas: Langtang National Park (1,710 km^2); Shey-Phoksundo NP (3,555 km^2); Dhorpatan Hunting Reserve (1,325 km²); Annapurna Conservation Area (7,629 km²); Sagarmatha NP (1,148 km²); Kangchenjunga Conservation Area (2,035 km²); Manaslu Conservation Area (1,663 km²). Qomolangma NR in China and centered on Mt. Everest, links protected areas of Makalu-Barun, the Sagarmatha, Langtang, Manaslu and Annapurna, thus offering a potentially vast transfrontier protected area (Singh and Jackson 1999).

<u>Pakistan:</u> Estimates of snow leopard range are around 80,000 km² (Table 1). Assuming a mean density of 1 per 250 km², the total population for Pakistan would be about 320. Occur in the Hindu Kush range in Northwest Frontier Province and the Karakorum Range of the Northern Areas (Gilgit, Hunza and Baltistan districts). Presence in Azad Kashmir remains unconfirmed. Known in Khunjerab National Park (2,669 km²);

Baltistan Wildlife Sanctuary (414 km²); Chitral Gol National Park (77.8 km²), and several other sanctuaries and small game reserves. Snow also occur leopards probably in four Conservancies totaling 16,300 km² where community-based biodiversity conservation initiatives are undertaken (MACP 2001). Except for Khunjerab and the new conservancies, most of these are too small to protect more than a very few cats.

<u>Russian Federation:</u> Occur in the Altai, West Sayan, East Sayan, mountains of Tyva Republic and Khakasia; total habitat is 60,000 km² (WWF/RAN 2002). Poyarkov & Subbotin (2002) estimated a total population of 150-200 in 8 main regional groups. The largest groups were on the Northern and Southern Chuiskii and Katunskii ridges (30-40) and Western Sayan (20-25). Confirmed in Sayano-Shushensky Biosphere Reserve (389 km²) and Altaiskiy State NR (864 km²). Also reported from the following *zakazniks*: Ininskiy (1,030 km²), Kosh-Agachskiy (2,413 km²), Shavlinskiy (1,780 km²) and Khindiktig-Khol'skiy (3,200 km²).

<u>Kyrgyzstan:</u> Snow leopards occur widely in the Tien Shan and Pamir-Alai systems. Koshkarev (1989) calculated range at 65,800 km² and judged mean density at 1 snow leopard per 100 km². Numbers have declined sharply since then and were estimated at 300-350 in 2005, excluding the south-west where surveys have not beeen conducted. Re-surveys of areas sampled by Koshkarev (1989) found sign density 2.5-3 times lower (Toropova et al. 2005). Snow leopards occur in the Besh-Aral Reserve (867 km²) Issyk-kul Reserve (190 km²) Naryn Reserve 370km²), Sary-Chelek Biosphere Reserve (238 km²), Sarychat-Ertash Nature Reserve (720 km²) and Ala Archa NP (194 km²).

<u>Kazakhstan:</u> Snow leopards occur along the Kyrgyz range and Trans-Ili Alatau of the northern Tien Shan bordering Kyrgystan, and the Dzhungarian Alatau, bordering China. Zhiryakov and Baidavletov (2002) estimated numbers at 100-110, including 30-35 in and around Almatinsky Reserve (915 km²). Also occur in Aksu Dzhebagly State Reserve (744 km²). Numbers are believed to have decreased sharply since 1991.

<u>Tajikistan:</u> Widely distributed in the Pamir and Pamir-Alai systems. Density highest in Rushan, Yazgulem, Vanch, Shugnan, Ishkashim, Sarykol and Trans-Alai ranges (Saidov, *in litt.* 2006). Muratov (2004) estimated numbers at 200-220. Population is widely belived to have declined since 1990 due to a reduction in ungulate prey. Present in the Tajik NP (26,000 km², up to 140 animals), Romit State Reserve (161 km²), Dashtidzhum State Reserve (197 km²), Zorkul Reserve (877 km²), and Mozkol (669 km²), and Dashtidzhum (501 km²) *zakazniks*.

<u>Uzbekistan:</u> Distributed in two areas, separated by the heavily developed Fergana Valley: Tien Shan (Ugam, Chatkal, Pskem ranges) and Pamir-Alai (Turkestan, Zeravshan, Hissar ranges). Total occupied area is estimated at 10,000km² and numbers at 30-50 (Esipov *in litt.* 2006). Snow leopards occur in Chatkal Reserve, Gissar Reserve, Zaamin Reserve, Ugam-Chatkal NP and Zaamin NP. These PAs cover about 65% of the range in the country.

Legal Status

International Level: Snow Leopards have been listed as Endangered (EN) in the IUCN Red List since 1988. They are included in Appendix I of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) since 1975, so all international trade in the species is prohibited. All range States except Kyrgyzstan and Tajikistan are a Party to CITES. Implementation and enforcement of the CITES provisions vary and are in some cases insufficient. A recent CITES resolution formally recognizes that all Asian big cats are threatened by the illegal use and trade of live specimens and bodyparts and calls upon CITES Parties, and range States in particular to improve national legislation and increase efforts to combat illegal killing of and trade in all Asian big cats.

Snow Leopard is listed in Appendix I of the Convention on Migratory Species of Wild Animal Species (CMS). Six of 12 range states are currently a Party to CMS: India, Kazakhstan, Mongolia, Pakistan, Tajikistan, Uzbekistan.

<u>National Level</u>: Snow Leopards are legally protected in all range states with the possible exception of Afghanistan. However some legislation is not very effective because penalties are too low to function as deterrent, or there are significant loopholes. The main challenge is ineffective or non-existent enforcement of existing laws. This is due to lack of awareness, political will, and priority and resources given to biodiversity conservation at governmental level. Wildlife rangers and enforcement officers are often poorly equipped and poorly paid, reducing their motivation. Corruption and bribery hinder effective law enforcement in some places.

Country Strategies and Action Plans

Snow Leopard Action Plans or Strategies exist for 5 countries at the present time: Mongolia (WWF 2000); Pakistan (Khan, 2001); Russia (WWF/RAN 2002); Nepal (Department of National Parks and Wildlife Conservation 2003); Uzbekistan (Uzbek Zoological Society/State Committee for Nature Protection 2004). Copies of these plans can be found on the SLN website or requested from SLT.

A decision has been taken to replace the Mongolia conservation plan developed in 1999 with a new National Conservation Policy, due to be completed and submitted for government approval during 2006. The Pakistan draft conservation strategy is still awaiting official government endorsement but some of its provisions are being implemented.

A national snow leopard conservation scheme in India (Ministry of Environment and Forests 1988) was focused on protected areas but never followed through. SLT-India has initiated a consultative process of obtaining Governmental acceptance for considering a new Strategy & AP and a Project Snow Leopard concept paper was circulated in 2004.

2. Threats and Conservation Actions

A key component of the SLSS process was to identify threats to long-term snow leopard survival. 21 threats were identified and grouped into four broad categories (Table 2). These are: Habitat and Prey; Direct Killing; Policy and Awareness; and Other Issues. In some cases threats are inter-related but they are listed separately so that the most appropriate conservation actions are easier to identify. Threats vary substantially across snow leopard range. For the purposes of SLSS, 4 broad regions were defined as a basis for prioritizing threats. Table 2 also shows the priority matrix.

The regions are:

- Himalaya (HIMLY): Himalaya, Tibetan Plateau and other S. China, India, Nepal, Bhutan
- Karakorum/Hindu Kush (KK/HK): Karakorum & Hindu Kush of Afghanistan, Pakistan, SW China
- Commonwealth of Independent States and W.China (CISWC): Uzbekistan, Kyrgyzstan, Kazakhstan, Tajikistan, China (Xinjiang)
- Northern Range (NRANG): China Altai, Mongolia, Russia

NRANG

Table 2. Prioritized Threats to Snow Leopard Survival by Region*

Primary Threats *Threats vary by specific area. Secondary Threats Threats by Category Region Category 1: Habitat and Prey Related HIMLY KK/HK CISWC 1.1 Habitat Degradation and Fragmentation 1.2 Reduction of Natural Prey due to Illegal Hunting 1.3 Reduction of Natural Prey due to Competition with Livestock 1.4 Reduction of Natural Prey due to Legal Hunting 1.5 Reduction of Natural Prey due to Disease 1.6 Fencing that Disrupts Natural Migration Category 2: Direct Killing or Removal of Snow Leopards 2.1 Killing of Snow Leopards in Retribution for Livestock depredation 2.2 Poaching Snow Leopards for Trade in Hides or Bones 2.3 Zoo and Museum Collection of Live Animals 2.4 Traditional Hunting of Snow Leopards 2.5 Secondary Poisoning and Trapping of Snow Leopards 2.6 Diseases of Snow Leopards **Category 3: Policy and Awareness** 3.1 Lack of Appropriate Policy 3.2 Lack of Effective Enforcement 3.3 Lack of Trans-boundary Cooperation 3.4 Lack of Institutional Capacity 3.5 Lack of Awareness Among Local People 3.6 Lack of Awareness Among Policy Makers **Category 4: Other Issues** 4.1 War and Related Military Activities 4.2 Climate Change 4.3 Human Population Growth or Poverty (indirect threat)

Category 1: Habitat and Prey

1.1 Habitat Degradation and Fragmentation. High altitude ecosysyems are fragile and vulnerable. The most common form of habitat degradation is caused by livestock overgrazing. Large scale resource extraction, road building, and urbanization are increasing within snow leopard range.

1.2 Reduction of Natural Prey due to Illegal or Unregulated Hunting. Mountain ungulates are hunted illegally or without regulation, for meat, trophies, and medicinal purposes. The illegal harvest likely far exceeds the legal harvest in many areas, with resultant declines in snow leopard food resources.

1.3 Reduction of Natural Prey due to Legal Hunting. In some cases, trophy hunting is not well managed and harvest levels are inappropriate or exceeded. There is rarely any provision for legal hunting by local people, which disenfranchises them and makes compliance with laws minimal.

1.4 Reduction of Natural Prey due to Competition with Livestock. Competition with livestock may result in declines of mountain ungulates thus reducing the natural prey base for snow leopards and increasing the risk of predation on livestock, which provokes conflicts and retribution killing by graziers.

1.5 Reduction of Natural Prey due to Disease or Transmission of Disease. Ungulate numbers are in decline in some areas apparently from disease. The types of diseases responsible and what role humans or livestock may be playing a role as vector is as yet unclear.

1.6 Fencing that Disrupts Natural Animal Movements and Migration. In some range states, borders have been fenced for national security reasons. Fences impede natural movements of wild ungulates and snow leopards and increase fragmentation of sub-populations.

Category 2: Direct Killing of Snow Leopards

2.1 Killing of Snow Leopards in Retribution for Livestock Depredation Loss. Snow leopards prey on domestic livestock in most areas with resultant retribution killing by herders. Greatest losses occur where native prey species have been reduced, but are also serious where herders employ poor guarding practices.

2.2 Poaching Snow Leopards for Trade in Hides or Bones. Snow leopards have long been hunted for their pelts, and demand remains high. Demand for snow leopard bones as substitutes for tiger bone in the traditional Asian medicine trade is increasing. Organized crime is playing an increasingly important role in illegal trade in many areas.

2.3 Zoo and Museum Collection of Live Animals. Live trapping and sale of snow leopards, particularly cubs, for private zoos may be a threat in some areas. There are well managed international breeding programs for captive populations and an excess capacity to produce cubs now exists.

2.4 Traditional Hunting of Snow Leopards. Snow leopard hides are traditional adornments for homes and clothing in many parts of their range. They can be a status symbol and a highly valued gift. Snow leopard hunters and trappers have long been respected in many societies.

2.5 Secondary Poisoning and Trapping of Snow Leopards. Snow leopards can be the unintended victims of indiscriminate trapping or poisoning campaigns aimed at other predators. The extent of these losses is difficult to assess.

2.6 Diseases of Snow Leopards. There are several reports from western Mongolia of a debilitating mange-like affliction. No samples have been collected and the impact of diseases on snow leopards is unknown.

Category 3: Policy and Awareness

3.1 Lack of Appropriate Policy. At both local and national levels there has been limited effort to establish appropriate conservation policies for snow leopards or their prey. Action Plans are lacking for the species in most range states.

3.2 Lack of Effective Enforcement. Existing laws and policies for snow leopards, their prey and their habitat are often poorly enforced. This can be due to lack of awareness by enforcement staff, lack of resources to carry-out enforcement, no priority or political will unclear responsibilities between different government agencies, and corruption at several levels.

3.3 Lack of Trans-boundary Cooperation.Transboundary cooperation and protected areas are crucial to conserving the species whose mountain ridge habitat often coincides with international borders. To reduce illegal trade in snow leopard products and live animals, effective trans-boundary enforcement of national and international trade regulations and information exchange is also critical, but lacking.

3.4 Lack of Institutional Capacity. Government agencies and protected area administrations across the range often lack the capacity to carryout protective measures. In many important snow leopard reserves, rangers and staff are poorly paid and lack basic equipment.

3.5 Lack of Awareness among Local People. In some cases people remain unaware of wildlife protection laws. The reasons for conserving a large predator which impacts their lives by taking livestock has not been adequately conveyed to most local people.

3.6 Lack of Awareness among Policy Makers. Lack of awareness can be a serious problem among policy makers who may have a poor understanding of conservation principles.

Category 4: Other Issues

4.1 War and Related Military Activities. Snow leopards and other wildlife fall victims to armed conflict and land mines in a few parts of the range. International peace keeping forces have also recently been found to be involved in illegal purchase of pelts of endangered species.

4.2 Climate Change. This has the potential to bring about fundamental changes to ecosystems with unpredictable effects on snow leopards and their prey. Most climate models currently indicate that current warming trends are likely to continue with potentially serious and adverse effects on mountain environments.

4.3 Human Population Growth and Poverty Human numbers are increasing rapidly within the region. More people live in poverty and may turn to more marginal habitats to eke out a living. This will place more and more people in direct competition with wildlife for limited resources.

Potential Actions to Address Threats

Grazing Management:

Maintaining rangeland quality through sustainable management, grazing rotations and appropriate stocking levels is critical to long-term viability for wild and domestic herbivores. Research required prior to taking action:

- Determine ungulate range and identify key sites (e.g. birthing; rutting, important pasture) •
- Determine human land use patterns •
- Collect baseline data on pasture quality, numbers of wild and domestic ungulates •
- Estimate carrying capacity of grazing areas ٠
- Identify ways to sustain pastoral livelihoods with minimal impact to rangelands •

| | Policy level | Community level | | | |
|---------------|--|--|--|--|--|
| Steps | Review legal and traditional land | Identify all stakeholders | | | |
| | tenure systems | Create livestock-free conservation areas | | | |
| | Offical support for community- | Collaboratively develop grazing plan | | | |
| | generated grazing plans | Monitor and adjust grazing plan | | | |
| Potential | Government: local, national | Community livestock owners | | | |
| Stakeholders: | Protected Area Administration | Users of plant resources (medicinal, food) | | | |
| | Conservation/Development NGOs | Agriculturalists | | | |
| Potential | determining grazing patterns may be a subject of contention | | | | |
| Pitfalls: | Grazing management may need to in | Grazing management may need to include reduction of livestock numbers | | | |
| | Prescriptive grazing plans without cor | Prescriptive grazing plans without community consultation will likely fail | | | |
| Monitoring | Defined collaboratively. May include: | | | | |
| Protocols / | measuring pasture quality; | | | | |
| success | indicators developed by local herders based on traditional knowledge | | | | |
| Indicators | numbers, health and productivity of wild ungulates and domestic livestock; | | | | |
| | level of compliance with grazing plan | | | | |
| Public | Raise awareness of legal grazing | Display map of natural resource use, key | | | |
| Awareness | limitations especially where | wild ungulate areas and grazing restrictions | | | |
| | Protected Area regulations apply | Disseminate grazing plan to community | | | |

Some Action Guidelines

Wildlife-based ecotourism

Wildlife-based tourism that provides jobs and financial benefits to local people adds economic value to wildlife and creates incentives to protect the resource.

Research required prior to taking actions:

- Identify target communities where wildlife tourism is appropriate
- Identify wildlife and other attractions: sites, views, locations, cultural events
- Conduct market research to determine demand and target market
- Conduct a feasibility study to assess infrastructure: access; transport; lodging etc.
- Conduct socio-economic assessment of target community to enable positive impact monitoring
- Conduct biological baseline survey to enable negative impact monitoring

Action Guidelines

| | Policy level | Community level | |
|---------------------|--|--|--|
| Steps | Educate decision makers about | Determine stakeholder groups | |
| | benefits of ecotourism | Assess local capacity to provide services, | |
| | Integrate with national or | Determine training needs and sources | |
| | international tourism | Develop wildlife-tourism Plan and marketing | |
| | campaigns | strategy | |
| | Seek funding for tourism development | Identify actions to be taken to benefit wildlife | |
| Stakeholders: | Local, regional, national | Local communities | |
| | government | Tour operators and travel agencies | |
| | NGOs | NGOs, CBOs | |
| Potential Pitfalls: | Relatively low abundance of wild | life (compared to e.g. East Africa) | |
| | Market saturation; all of snow leopard range can not be a tourist destination | | |
| | Inequitable distribution of financial benefits of tourism may lead to resentment | | |
| | May expose remote snow leopard area to international poachers | | |
| Monitoring | Biological: | | |
| Protocols/Success | Numbers, trends and produc | tivity of wild ungulates | |
| Indicators | Density of snow leopard sign | | |
| | Quality of pastures | | |
| | Socio-economic | | |
| | Level of economic benefit to | local people | |
| | Local attitudes toward wildlife and tourists | | |
| | Tourist awareness of local conservation issues | | |
| Education/Public | Publicize examples of best practice Publicize examples of best practice | | |
| Awareness: | conservation linked wildlife-tourism • Promote ecofriendly business partners | | |
| | at policy making levels | Publicize successes, biological and economic | |

Cottage Industry

Providing income generation opportunities for communities through handicraft manufacture and marketing opportunities with direct and transparent linkages to wildlife conservation. Research required prior to taking action:

- Assess the nature and extent of the conservation threat and actions required
- Assess target community income generation needs and opportunities
- Conduct biological baseline survey to enable impact monitoring

| | Policy level | Community level | |
|--|--|--|--|
| Steps | Gain government recognition of need and importance of community generated conservation contracts Gain local governments and/or Protected Area administration support in development of conservation contracts Establish communications channel for reporting contract violations | Contract development Identify stakeholders Define conservation actions the community will commit to in exchange for income generation opportunities Prepare conservation contract with explicit conservation and business commitments Establish incentive structure Develop monitoring and success indicators Handicraft product development Evaluate skills, capacity, and training needs Develop business plan and distribution strategy | |
| - | Conduct ongoing independent sc | ientific monitoring to ensure contract compliance | |
| Stakeholders: | PA administration and wildlife conservation agencies NGOs Micro-credit agencies | Local communities particularly in buffer zones of Protected Areas Local businesses and traders | |
| Potential Pitfalls: | High logistical costs due to remot Time constraints imposed by clim Consistently meeting quality expe Pressure on natural resources if an another second se | eness and difficulty of access. nate and production cycles ectations of broad market materials used are in short supply. | |
| Monitoring Protocols/Success Indicator | iological: Numbers, trends and productivity of wild ungulates Density of snow leopard sign Other indicators as determined by community and conservationists Socio-economic Numbers of local people gaining benefit Financial impact at household and community levels Public attitudes to snow leopards | | |
| Education/Public Awareness: | Publicize examples of best practi Publicize success indicators both | ce conservation linked income generation | |

Trophy Hunting Programs

Trophy hunting programs should be sustainable, well monitored and provide return to local people as an incentive to protect ungulates. Community co-management should be encouraged whereever appropriate. Research required prior to taking action:

- Determine sustainable trophy harvest level using scientifically appropriate methods
- Assess trophy hunting demand and potential value via market analysis
- Determine local social structure and their authoritative role in hunt management
- Conduct biological baseline survey of ungulates and snow leopard presence
- Conduct socio-economic assessment of target community to enable impact monitoring

Action Guidelines

| | Policy level | Local level | |
|---------------------|--|---|--|
| Steps | Engage government agencies | Assess current levels of hunting by | |
| | responsible for hunting | community and evaluate motives | |
| | Review hunting laws | Introduce community to potential economic | |
| | Develop community co- | benefits of trophy hunting | |
| | managed trophy hunting | Include harvest by community in program | |
| | Establish harvest monitoring | Assess local capacity to service program | |
| | system for setting quotas | Develop comprehensive trophy hunting plan | |
| | Assess import policies of most | with equitable financial distribution | |
| | important markets (for trophies | Develop local capacity to conduct wildlife | |
| | of CITES-listed species | surveys, monitoring, and reporting | |
| Stakeholders: | Local and national | Legal hunters | |
| | government | Poachers | |
| | Hunting organizations | Herders | |
| | NGOs, International NGOs | Tourism operators | |
| Potential Pitfalls: | Corruption at government level w | ith the sale of illegal licenses | |
| | Corruption at local level allowing | hunting regardless of management plans | |
| | Lack of awareness and respect f | or the law among foreign hunters | |
| | Insufficient hunting receipts reach local level (held at higher government levels) | | |
| Monitoring | Biological: | | |
| Protocols/Success | • Numbers and trends of wild ungulates | | |
| Indicators | Density of snow leopard sign | | |
| | Basic harvest indicators such as hunting effort, trophy size, etc. | | |
| | Socio-economic | | |
| | Number of local people gaining benefit from the ecotourism initiative | | |
| | Financial impact at household and community levels | | |
| Public Awareness | Publicize examples of best practice community managed trophy hunting | | |
| | Publicize success indicators, both biological and socio-economic | | |
| | Market conservation based progr | rams to international hunting audience | |

Reducing poaching and trade in snow leopard parts

Research required prior to taking action:

- Determine location, nature and extent of snow leopard poaching for trade, and poacher motivation
- Determine the nature of trade in snow leopard parts including supply, demand, value, trade centers and routes, participants (organized crime, government officials/agencies, individuals) and end consumers

| Action Guidelines | | | | |
|---------------------|--|--|--|--|
| | Policy level | Community level | | |
| Steps | Establish anti-poaching units Awareness campaigns targeting decision makers Ensure legislation is enforced Make fines for violations large enough to be a deterrent Enact whistle-blower laws Establish information exchange among governments and institutions Collect data on killing/trade Encourage range state not yet CITES parties to accede | Raise awareness of illegality of trade in snow leopard parts, penalties, Raise awareness of "whistle-blower laws" and rewards for information, establish procedures, rewards, and safeguards for confidentiality Establish a locally based informant rings where practical and socially acceptable Police market centers where pelts and other body parts are being sold Raise awareness of the potential value of live living snow leopards to local communities (ecotourism, etc.) Provide alternative income to poachers | | |
| Stakeholders: | National CITES Authorities | • Hunters | | |
| | Wildlife and PA agencies | Poachers of snow leopards | | |
| | Law enforcement agencies | Traders in snow leopard parts | | |
| | International/national NGOs | | | |
| Potential Pitfalls: | Organized crime rings may prese | ent danger | | |
| | Government corruption at all level | els may obstruct enforcement of wildlife laws | | |
| | Lack of awareness, or lack of interest | erest among agencies responsible for enforcement | | |
| Monitoring | Level of awareness of laws gove | Level of awareness of laws governing trade in protected species | | |
| Protocols/Success | Attitudes among local communiti | Attitudes among local communities towards poaching and trade in snow leopards | | |
| indicators | Level of snow leopard poaching | and trade | | |
| | Level of cross-border communication | ation and cooperation | | |
| | Number of cases prosecuted, pe | ed, penalties applied and publicized | | |
| Education/Public | Raise awareness of legal issues concerning trade in endangered species | | | |
| Awareness: | Raise awareness of the critically | endangered status of snow leopards | | |

Action Guidelines

Reducing livestock depredation by snow leopards

Research required prior to taking action:

Determine the location, nature and extent of the depredation problem and identify hotspots Determine trends in depredation using historic and current documentation

| Action Guidelines | | | | |
|--------------------------------|---|---|--|--|
| | Policy level | Community level | | |
| Steps | Establish livestock depredation monitoring methods for all predators Establish systematic database for storing records of depredation Develop policies for removal of individual snow leopards which are known serial depredators | Determine appropriate strategies for alleviating the conflict Community insurance program Establish community management structure Integrate with income generation schemes Improved herding practices Corral protection | | |
| Stakeholders: | Protected Area Authorities | Livestock herders/owners | | |
| | Wildlife departments | Local Government | | |
| Potential Pitfalls: | Long term sustainability if resour Difficult to separate scavenging to Guard dog breeding programs no Insurance programs may need to | Long term sustainability if resources required to maintain predator proof housing Difficult to separate scavenging from actual predation Guard dog breeding programs need rigorous management | | |
| Monitoring | Numbers of animals lost to pred | ators (as opposed to other factors) | | |
| Protocols/Success | Number of incidences of depred | Number of incidences of depredation | | |
| Indicators | Number of predators killed in ret | Number of predators killed in retribution for livestock losses | | |
| Education/Public Awareness: | Publicize best practice examples of livestock depredation reduction strategies among policy makers and communities with similar concerns | | | |

Animal Husbandry

Provide training in animal husbandry and veterinary care to improve monetary return at lower stock levels, and reduce impacts on pasture and rangelands

Research required prior to taking action:

- Identify target area where wildlife and livestock conflicts exist.
- Determine extent of overgrazing; forage competition and disease transference
- Determine baseline data in terms of livestock health and financial impact of disease
- Determine baseline data on livestock numbers and financial returns

Action Guidelines

| | Policy level | Community level | | |
|--|---|---|--|--|
| Steps | Review livestock health policies and practices at local and national level Engage departments of agriculture and/or livestock in identifying nature of the problem and developing appropriate strategies | Determine strategies for improving livestock health and herd quality Develop strategy to benefit wildlife Determine resources and skills required Identify funding sources Establish community structure to manage the program Develop funding and business plan | | |
| Stakeholders: | Government livestock and wildlife departments NGOs | Herders/livestock owners Veterinary and animal husbandry workers | | |
| Potential Pitfalls: | Requires long-term commitment of May require supplementary funding Low basic education levels in targ Local acceptance of fewer high-q | Requires long-term commitment of community and implementing organization May require supplementary funding: Low basic education levels in target communities | | |
| Monitoring Protocols & Success Indicators | Numbers of livestock and financial returns Livestock health, livestock production, impact of vaccination programs Numbers of wild ungulates and snow leopard sign density Stocking density and carrying capacity of pastures | | | |
| Education/Public Awareness: | | Publicize success indicators, both socio- economic and biological | | |

Conservation Education and Awareness

Research required prior to taking action:

- Current attitudes or level of understanding of specific issue among the target audience
- Level of education, literacy, cultural factors influencing the choice of appropriate media

Action Guidelines

| | Policy level | Community level | | |
|---|---|--|--|--|
| Steps | Integrate conservation education into national curriculum Prepare education campaign for law enforcement officers Integratie departments into awareness campaigns | Identify local "coordinators" of conservation education, provide training Identify key issues in target area Identify target audience(s) Determine message to be delivered and media Develop educational materials Conduct monitoring assessments | | |
| Stakeholders & Potential Audiences: | Government officials Law enforcement officials Protected Area staff Development agency staff | Livestock herders Hunters and poachers Women and young people Community elders and school teachers | | |
| Potential Pitfalls: | Low levels of education and lite Linguistic and cultural barriers Limited capacity & infrastructur Financial sustainability of any education | Low levels of education and literacy Linguistic and cultural barriers between different groups Limited capacity & infrastructure of education systems Financial sustainability of any education campaign is difficult to maintain | | |
| Success indicators | Change in attitudes and behav Level of knowledge of wildlife in | Change in attitudes and behavior Level of knowledge of wildlife in target audience | | |
| Education/public awareness | Disseminate lessons learned re Promote hands-on education, s | garding successful strategies uch as nature clubs | | |

17 | SNOW LEOPARD SURVIVAL STRATEGY

3. Research and Information Needs

A set of 31 research and information needs was identified to serve as a guide for prioritizing and funding research programs across snow leopard range. These were assessed at regional and range-wide scales following consultation with experts. Table 3 shows the list of needs and the priority matrix. Several of the priorities identified are linked, and across the range the key information needs can be categorized as: (a) development and implementation of snow leopard population estimation techniques, (b) a better understanding of poaching pressures, (c) evaluation of the attitudes socio-economic conditions of local communities, (d) better understanding of prey species distribution and status.

Gaining a more accurate picture of current distribution and population size is a critical need when formulating conservation programs and in monitoring population trends. New methodologies and techniques developed for other carnivore species, especially tigers, are being increasingly utilized in snow leopard field programs. These include camera-trap surveys allied with robust statistical techniques to census snow leopards (e.g. Jackson et al. 2006); satellite and GPS collaring (eg SLT project in Pakistan in 2006); non-invasive techniques such as genetic analysis of scats and hairs to identify individuals and estimate population size. Correlation of SLIMS data with known population sizes and with the results of new methodologies will help to validate the technique as a predictive tool. A further use of individual genetic analysis lies in identifying phylogeographic patterns within the global population.

Assessing the extent and causes of poaching for fur and bones is a high priority as kecent reports indicate that the rate may be increasing. A steep increase in poaching occurred in the Central Asian states after 1991 (Koshkarev & Vyrypaev 2000). The need for better understanding of the distribution, population size and trends of prey populations is also very important. An equally strong need is gaining an understanding of human attitudes to snow leopards and profiling the socio-economic status of local communities. This reflects the fact that the survival of the snow leopard will ultimately be determined by attitudes of people who share its habitat.

4. Country Action Planning

One of the primary uses of the SLSS is to aid in the development of area-specific Action Plans. In most cases, the appropriate scale for these is the range state, because legislative frameworks, implementing agencies, protected area administrations, and budgets all operate principally at the national level. However, where countries are large and conservation issues differ, state or provincial plans may be required. This is guite likely the case for China and possibly India. In some circumstances, a regional or trans-boundary approach may be more appropriate.

There are various methodologies for developing Conservation Strategies and Action Plans. A format used widely, including by the IUCN/SSC Cat Specialist Group, has the following broad elements. A Status Report is compiled that contains all baseline ecological information including on habitat and prev, and a prioritized list of threats facing the species. Based on the Status Report a Conservation Strategy and Action Plan are developed. The strategy begins with a long-term Vision followed by a Goal. Based on analysis of the major threats, specific **Objectives** of the Conservation Strategy are defined in order to achieve the goal. Each objective has a set of actions needed to attain it. Objectives and actions should have clear targets and time frames against which success can be measured. Regular review, and revision where appropriate, are integral to Action Plans.

The snow leopard is often used as either or both a flagship species and an umbrella species for the conservation of high-altitude ecosystems. Its future is inextricably linked to its prey and the wider montane environment as well as to the people who share and depend on it. The vision should recognize this broad perspective and envisage a sustainable environment for the mutual benefit of wildlife and people in perpetuity.

Table 3. Prioritization of Research and Information Needs by Region

(as above; RW = range-wide)

Scores - 3 High, 2 Medium, 1 Low Top 10 (plus any ties) Second 10 (plus any ties)

Research or Information Needs

- R1 Snow leopard distribution and "hot spots"
- R2 Snow leopard migration and dispersal routes
- R3 Snow leopard population size.
- R4 Snow leopard population trends and factors involved
- R5 Protected Area coverage-extent, presentation of habitats
- R6 Habitat degradation and relative impacts
- R7 Snow leopard --prey relationships
- R8 Prey species distribution and "hot spots"
- R9 Prey population baseline and trends
- R10 Dynamics of illegal ungulate hunting
- R11 Dynamics of legal ungulate harvest and statistics
- R12 Wild ungulate—livestock interactions (competition)
- R13 Ungulate disease
- R14 Snow Leopard poaching levels
- R15 Illegal trade in wildlife parts
- R16 Livestock depredation rates
- R17 Livestock depredation causes
- R18 Grazing pressure and range conditions
- R19 Snow leopard disease
- R20 Snow leopard home range size and habitat use
- R21 Snow leopard social structure and behavior
- R22 Snow leopard population genetics
- R23 Snow leopard food habits
- R24 Snow leopard relationships to other predators
- R25 Economic valuation of snow leopards
- R26 Snow Leopard monitoring techniques development
- R27 Socio-economic profiling of herder communities
- R28 Methods to alleviate impacts of war
- R29 Livestock and human population status and trends
- R30 Analysis of existing policies and laws
- R31 Human attitudes to snow leopards

The status report is a technical document produced mainly by experts. The conservation strategy/action plan need to be developed in a participatory process with all relevant GOs, NGOs and stakeholders represented. It is particularly important to involve the agencies who will have responsibility for implementing the strategy. Top-down plans are rarely successful because they fail to bring in all of the grass-roots stakeholders at the outset. A thorough analysis to identify stakeholders is needed at the beginning of the process. The Strategy and Action Plan are best developed in a workshop involving all stakeholders, e.g. through a "Logical Framework" process. Drafts should be reviewed by the broadest audience possible to ensure the plan

| ымі у | | Region | | DW |
|------------------|-----|--------|-----|-----|
| 3.0 | 2.6 | 3.0 | 3.0 | 3.0 |
| 2.0 | 1.2 | 2.9 | 3.0 | 1.0 |
| 2.5 | 1.5 | 2.0 | 3.0 | 2.6 |
| 2.5 | 2.0 | 2.0 | 3.0 | 2.0 |
| 2.0 | 2.0 | 2.9 | 2.0 | 2.5 |
| 2.3 | 2.0 | 2.0 | 3.0 | 1.5 |
| 2.5 | 1.0 | 1 0 | 2.0 | 1.5 |
| 2.0 | 2.0 | 25 | 3.0 | 2.0 |
| 2.4 | 2.0 | 2.5 | 3.0 | 2.0 |
| 1.5 | 1 7 | 2.0 | 2.0 | 2.5 |
| 1.5 | 21 | 2.0 | 2.0 | 17 |
| 2.7 | 2.1 | 1.3 | 1.0 | 1.7 |
| 1 7 | 2.0 | 2.3 | 2.0 | 1.0 |
| 1.9 | 2.9 | 3.0 | 3.0 | 2.9 |
| 1.9 | 2.9 | 2.9 | 2.0 | 2.6 |
| 2.1 | 2.7 | 1.6 | 2.0 | 2.0 |
| 2.1 | 2.7 | 1.1 | 2.0 | 2.0 |
| 2.4 | 1.4 | 1.8 | 2.0 | 1.6 |
| 1.2 | 1.3 | 2.6 | 1.0 | 1.1 |
| 2.0 | 2.6 | 2.5 | 2.6 | 1.8 |
| 1.8 | 1.3 | 2.6 | 3.0 | 1.7 |
| 1.8 | 1.1 | 2.4 | 2.0 | 2.1 |
| 1.7 | 1.3 | 2.5 | 2.0 | 1.8 |
| 1.8 | 2.0 | 2.8 | 2.0 | 1.6 |
| 1.8 | 2.4 | 2.8 | 3.0 | 1.4 |
| 2.6 | 1.7 | 3.0 | 2.0 | 2.9 |
| 2.4 | 2.6 | 2.0 | 2.0 | 2.4 |
| 1.6 | 1.3 | 2.0 | 1.0 | 1.3 |
| 2.4 | 1.1 | 2.3 | 2.0 | 1.9 |
| <mark>2.0</mark> | 3.0 | 2.4 | 1.0 | 1.6 |
| 2.5 | 2.8 | 1.9 | 3.0 | 2.2 |

has accurately captured the input from all contributors.

This SLSS provides a broad list of potential actions to address common and serious threats. However, action must be tailored to meet the specific conditions of each country, region or site. An Action Plan must also identify who will undertake each activity. A Plan that identifies actions but has no available resources to implement them, nor a responsible entity to lead them, is doomed to failure.

Action Planning Assistance

The Snow Leopard Network (SLN) membership collectively has experience in all areas of snow leopard related conservation, research, education, and policy. SLN can provide assistance in terms of expertise and advice

5. Taking the SLSS Forward

A key outcome of the SLSS Workshop was the creation of the Snow Leopard Network (SLN) to carry forward the SLSS. SLN is a partnership of organizations and individuals from government and private sector who work together for the effective conservation of the snow leopard, its prey, and their natural habitat to the benefit of people and biodiversity. SLN has articulated the following mission statement, goal, and objectives.

<u>Mission Statement</u>: To promote sound scientifically-based conservation of the endangered snow leopard through networking and collaboration between individuals, organizations, and governments.

<u>Goal</u>: Establish and strengthen professional linkages for addressing the crucial issues affecting the survival of snow leopards and their prey species, and the livelihood opportunities of local people.

Objectives:

- Establish the SLN as lead coordinator for promoting snow leopard research and conservation.
- Facilitate the implementation of the SLSS, and relevant aspects of CMS, CITES, CBD etc.

during the action planning process. They can be approached for assistance through ISLT at <u>http://snowleopard.org</u> or <u>info@snowleopard.org</u>; the SLN can also be directly reached on their website at <u>http://snowleopardnetwork.org</u> or by email at <u>admin@snowleopardnetwork.org</u>.

- Promote development and implementation of country action plans for snow leopards.
- Promote scientific management and conservation of snow leopard, natural prey and their mountain ecosystem.
- Build and strengthen capacity in range states for snow leopard conservation.
- Formulate position statements on snow leopard related issues drawing on the combined knowledge and expertise of the SLN members.

The Steering Committee consists of 6 members elected by the membership for a three-year term plus a Chair and an Executive Director. The Chair and at least 4 committee members must be from a snow leopard range state. Several committees have been established with responsibility for particular activities.

Everyone involved in any aspect of snow leopard conservation is urged to apply for either Full or Affiliate membership of SLN (free of charge). Organizations involved in snow leopard conservation may apply for Organizational membership. Details on the website: www.snowleopardnetwork.org

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