

FADING FOOTPRINTS:

THE KILLING AND TRADE OF

SNOW LEOPARDS

STEPHANIE THEILE

A TRAFFIC REPORT



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Uncia uncia in winter

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THE KILLING AND TRADE OF SNOW

LEOPARDS

by Stephanie Theile



Credit: Joe Fox, courtesy of the International Snow Leopard Trust

Snow Leopard *Uncia uncia*.

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EXECUTIVE SUMMARY

Snow Leopards, in a genus of their own, are endangered big cats. They inhabit rugged, mountainous terrain, in 12 range States - Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, the Russian Federation, Tajikistan and Uzbekistan. There are regional differences in prey, but the cats' natural prey includes ungulates and rodents. The global population of Snow Leopards is estimated to be between about 4000 and 7000, but sharp declines in populations have been reported over the past decade from parts of the species's range. High levels of hunting for the animals' skins and for live animals, for zoos, during the last century contributed to the species's endangered status and, from the 1970s, legal measures were taken for its protection. In 1975, the species was listed in Appendix I of CITES (the Convention on International Trade in Endangered Species of Fauna and Flora) and in 1985 it became an Appendix-I species of the Convention of Migratory Species. It has been accorded nation-wide legal protection in almost every range State, in some cases since the 1970s. In spite of such provision, Snow Leopards have been hunted during the 1990s in numbers as high as at any time in the past and this killing continues in the present century.

Several factors are adversely affecting Snow Leopards throughout their range. These factors show regional variation and are sometimes inter-connected. The picture that emerges shows that the species is menaced primarily by direct, intentional killing and loss of wild prey, with habitat fragmentation and accidental trapping or poisoning as secondary threats. Direct killing of Snow Leopards is driven by two main objectives: the desire to protect domestic livestock from predating cats and the desire to trade in the animal or its parts, but the two objectives cannot always be separated entirely. The cost of livestock loss can be very great and herders are often driven to kill Snow Leopards, either following an attack on livestock, or to prevent future attacks. However, herders are likely to try and sell Snow Leopard parts whenever the opportunity arises, so that, even where trade was not the primary incentive for killing, it is usually the end result. Generally speaking, conflict with herders is seen as the main threat to Snow Leopards in the Himalayan region of their range and in the Karakorum and Hindu Kush mountains, while killing for trade is the prominent threat in the central Asian region and northern part of the species's range - in the Chinese Altai and Tien Shan mountains, Mongolia and the Russian Federation. There are indications that both types of threat - that resulting from conflict with herders and that arising from the incentive to trade in Snow Leopard body parts - have increased in recent years. Loss of natural prey is a threat to the species throughout its range, sometimes caused by competition for grazing with domestic livestock or by unmanaged hunting by humans. These pressures on wild prey can drive Snow Leopards to seek alternative prey among domestic stock, and so lead to resentment and killing of the cats by herders.

These threats have been the subject of extensive study and this report draws on the findings of such research. Additionally, original surveys of trade in Snow Leopards, were conducted, especially for this project, in Mongolia and Pakistan, and information was collected by consultants in India and the Russian Federation during 2002. The results clearly show that Snow Leopards and their parts are traded in all range States, with the possible exception of Bhutan. In the large majority of cases, this trade is illegal.

Although it is difficult to assess the present-day scale of trade, a growth in Snow Leopard hunting specifically for trade is reported from central Asian range States and the Russian Federation, in particular, since political and economic instability was ushered in by the dissolution of the Soviet Union at the beginning of the 1990s.

Pelts appear to be the main Snow Leopard product in demand, but there is also evidence of demand for live animals for zoos and circuses. Other body parts found in trade include bones, nails, meat and the sexual organs of male cats. Snow Leopard bones are known to be valued for traditional Asian medicine and have medicinal properties similar to those of Tiger bones. Evidence of trade in Snow Leopard bones has been reported from China and Nepal and in some other range States concern was expressed that awareness of a demand for the bones could increase hunting pressure on Snow Leopards. Nevertheless, it is not clear if bones are sometimes the primary incentive for killing Snow Leopards or, rather, a by-product of the skin trade. It is similarly unclear whether demand for Snow Leopard bones has increased in the past 10 years, in response to more stringent controls on the use and trade in Tiger bones and more in-depth investigation is required to better understand this aspect of the trade.

As with other wildlife products, prices for Snow Leopard products vary widely according to sales context. Pelts were found on offer for USD50 when sold to middlemen and for around USD350-500 at markets in Mongolia and Pakistan, in 2002, but significantly higher prices have been reported from other regions. Prices are, in any case, sufficiently high to act as an added incentive to herders to kill Snow Leopards that may harm their livestock.

Demand for Snow Leopard products is at national and international level and consumers are reported to have included the powerful and privileged in the central Asian range States, Mongolia, Pakistan and the Russian Federation, while the Middle East and Europe were cited as destinations for skins outside the Snow Leopard's range. Foreign visitors to range States were reported as a conspicuous category of customer for Snow Leopard products, helping to keep this illegal and damaging trade alive.

Different actions are needed in different parts of the Snow Leopard's range in order to try and reduce the level of threat to the species. Some recommendations of this report will have greater importance in certain parts of the species's range than in others and, in short, applicability is not range-wide. The order of listing the following recommendations does not denote any order of priority for action.

Recommendations of this report, for the conservation of Snow Leopards are to:

Strengthen national legislation and conservation policies for the benefit of Snow Leopards,
by:

- filling gaps in range State legislation to prohibit the hunting, killing, possession, sale and trade of Snow Leopards, including all body parts and derivatives, at local, regional and national levels;
- offering legal assistance and advice to range States;
- meting out sufficient penalties to those who break laws to protect Snow Leopards;
- considering the benefits of "whistle-blower" policies that provide incentives to report illegal activities involving Snow Leopards;

- applying the CITES Resolution and Decisions relevant to Asian big cats; and
- the adherence of Kyrgyzstan and Tajikistan to CITES.

Strengthen law enforcement capacity, by:

- tightening controls along known trade routes, and at markets and border crossing points;
- improving co-operation among enforcement personnel and the exchange of intelligence at local, national and international levels;
- establishing anti-poaching teams;
- carrying out regular monitoring of major markets and trade centres;
- providing technical enforcement assistance and training;
- ensuring the proper disposal of seized Snow Leopard items; and
- providing identification material to aid enforcement.

Protect livestock from Snow Leopard predation, through:

- better herding and guarding practices and
- the provision of predator-proof corrals.

Protect and/or recover the natural prey base of Snow Leopards, by:

- improved grazing management and animal husbandry;
- investigating unregulated/illegal hunting of prey species;
- monitoring the impacts of “pest” control programmes for smaller mammals which constitute Snow Leopard prey; and
- supporting studies to evaluate the biology, population trends and habitat needs of wild ungulates.

Provide human communities living locally to Snow Leopards with economic incentives for their conservation, by:

- the creation of schemes that generate sufficient income to allow toleration of Snow Leopards and protection of wild ungulates and their habitat;
- the development of livestock insurance schemes, where appropriate;
- assessing the feasibility of community-based trophy-hunting of wild ungulates and other mammals, as a tool to provide economic incentives for local communities to conserve wildlife and habitats; and
- promoting the establishment of conservation-based tourism programmes, to bring additional income to local communities.

Minimize “non-targeted” killings of Snow Leopards, by:

- considering the use of non-selective trapping and poisoning methods, with a view to minimizing the risk of capturing the “wrong” animal.

Raise awareness of the threats posed to Snow Leopards, by:

- developing programmes to educate communities living locally to Snow Leopards on this subject, while paying careful attention to local concerns and involving stakeholders;
- educating potential consumers of Snow Leopard products; and
- encouraging range State governments to initiate education programmes aimed at increasing public awareness of the problems besetting Snow Leopard conservation, including illegal trade involving government officials, especially those responsible for law enforcement in Snow Leopard range States.

BACKGROUND AND INTRODUCTION

The Snow Leopard *Uncia uncia* is an endangered “big cat”¹, inhabiting the mountains of central Asia and the Himalayan region. For centuries, Snow Leopards have been valued for their long, thick fur and admired for their strength, elusiveness and ability to survive in harsh, high-altitude environments.

Besides inspiring the myths and cultures of mountain communities, the Snow Leopard has also been exploited by humans. Historically, the demand for pelts and live animals for zoos may have had most impact on the species. A review of Snow Leopard skin exports from central Asia and Russia in the first two decades of the twentieth century put the annual world trade in Snow Leopard skins at 1000 a year (Heptner and Sludskii, 1972). Following concerns about the high numbers of skins in trade, especially during the 1960s, and lobbying by conservation groups, the International Fur Trade Federation (IFTF) recommended in 1971 that its members enter a moratorium on trade in Tiger *Panthera tigris*, Clouded Leopard *Neofelis nebulosa* and Snow Leopard skins and subscribe to a three-year ban on trade in Leopard *Panthera pardus* and Cheetah *Acinonyx jubatus* skins (Nowell and Jackson, 1996). Four years later, CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, entered into force and commercial trade in Snow Leopards and their body parts and derivatives has been prohibited since 1975, as a result of the species’s categorization in CITES Appendix I. World trade in spotted cat skins has decreased steadily since the mid-1970s: many consumers in the Western world no longer favours such furs, largely influenced by the ‘anti-fur campaigns’ by conservation groups in the 1980s.

These initiatives and trends in the latter half of the twentieth century were to the benefit of Snow Leopard conservation but the killing of Snow Leopards in most parts of their range continued. In recent years, there have been reports of increased levels of Snow Leopard killings, especially in the Russian Federation and central Asia² (Koshkarev, 1994; Anon., 2002a; Dixel, 2002). In Kyrgyzstan, killings of Snow Leopards are said to have increased three- to four-fold since the early 1990s (Koshkarev, 1994), giving rise to concerns about how much longer local Snow Leopard populations can sustain such pressure. Motives for such killings vary. In some cases, trade and associated profit are the incentive; in other cases, Snow Leopards are killed because they are a nuisance to livestock herders but, whatever the reason, it is likely that the animal or its parts will ultimately enter trade. High prices are often paid for Snow Leopard skins and the bones, like those of other big cats, are used in traditional Asian medicines. While increased awareness of the threats facing Tigers has undoubtedly benefited that species, emphasis on the Tiger alone may have shifted the trade to other big cats of equal conservation concern, such as the Snow Leopard.

The following report was compiled with the aims of:

- providing a better insight into motives for killing Snow Leopards and subsequent trade in their body parts and
- assessing the scope and scale of this trade and its recent trends.

The distribution, population and regulatory status of Snow Leopards in each range State are described and the different types of threat affecting the animals throughout their range are set

out in the preliminary chapters. The range State accounts, which contain findings based on original research, notably in Mongolia and Pakistan, focus on the threat to Snow Leopards from trade. Other threats in each range State are referred to, however, to provide general contextual information, especially since the incentive to trade in Snow Leopards is often interwoven with other types of threat, notably confrontation with herders of domestic animals.

It is hoped that the findings of this report will help to address the root causes for killing Snow Leopards and support the long-term survival of the species, as well as the livelihoods and future of those people sharing mountain areas with this cat.

METHODOLOGY

A large part of this report is based on literature, both published and unpublished, and correspondence. Much of the information derives from unofficial or anecdotal reports and “grey literature”, owing to the unavailability of comprehensive government-held data on Snow Leopard killings, trade, or seizures of products in most range States. The web-based bibliography generated by the International Snow Leopard Trust, as part of the Snow Leopard Survival Strategy, holds more than 450 references and over 200 full text documents and this source was widely consulted (see www.snowleopard.org/sln/Bibliography.htm). Additional information was gathered as part of the Snow Leopard Survival Strategy, through interviews and questionnaires, which were distributed to more than 60 scientists, conservationists and government personnel in Snow Leopard range States and elsewhere. (The Snow Leopard Survival Strategy is an initiative of the International Snow Leopard Trust and partner organizations, designed to co-ordinate efforts to conserve the species throughout its range).

First-hand surveys were undertaken for this project in Mongolia and Pakistan, with the aim of gaining a better understanding of Snow Leopard trade in these countries. The survey in Mongolia was conducted between mid-June and July 2002, in co-operation with Irbis Mongolia Centre, the Mammalian Ecology Laboratory of the Institute of Biology of the Mongolian Academy of Sciences in Ulaanbaatar, and WWF Mongolia. Market and field surveys were undertaken in south, south-west and western Mongolia. Among the markets visited were two markets in Ulaanbaatar (Tsaiz market and Tavan Erdene market) and several smaller markets located in the towns of Altay, in Govi-Altay province, Hovd in Hovd province, Ölgii in Bayan-Ölgii province, Ulaangom in Uvs province and Dalanzadgad in Ömnögovi province. In addition, interviews were conducted with a variety of local stakeholders, such as local government authorities, wildlife rangers and herders in the areas of Mongolia where Snow Leopards occur, including the Altai, Hangayn Nuruu, Harkhyra and Haanhöhiy Uul mountain ranges, and with traders of wildlife products at local markets. Available information on Snow Leopard poaching and trade in Mongolia was collected from the Ministry of Nature and Environmental Protection Agency, the General Customs Department, the Railroad Customs Office and the Border Control Agency. In Pakistan, surveying was carried out in July and August 2002, in collaboration with WWF Pakistan (Peshawar Regional Office). The availability of Snow Leopard products in different cities in Pakistan was investigated. Similar surveys had already been undertaken in January 2002, in Lahore, Peshawar and Skardu. In July 2002, investigators revisited the markets in Lahore and Peshawar and additionally surveyed markets in the cities of Islamabad, Rawalpindi and Karachi, reported to be important trading centres for wildlife products, especially skins. At least 12 market areas and more than 100 shops were surveyed.

Additional first-hand information was received, on Russia, from Andrey Poyarkov of the Russian Academy of Science; on India, from Manoj Misra, TRAFFIC consultant; and from TRAFFIC’s own questionnaire survey of experts and government personnel in Snow Leopard range States and other countries (see **Annex**).

Local currencies have been converted into US dollars (USD), at rates for September to March 2002, using an internet-based currency converter.

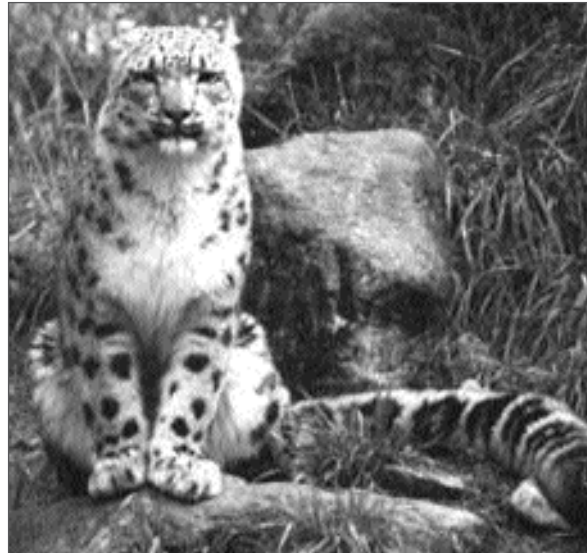
SPECIES INFORMATION

Biology and habitat

The Snow Leopard is the only member of the genus *Uncia*. Its classification in a separate genus from the other big cats is justified by its unique hyoid apparatus (a series of skeletal elements which support the base of the tongue) (Hast, 1989). The distinction between “big cats” and “small cats” is not based on size, as the terms suggest, but on the type of hyoid. In big cats this has cartilaginous portions, whereas in the small cats, the hyoid is completely ossified or bony. The hyoid and a series of thick fibrous pads on the vocal cords of big cats

enable them to roar, but they are unable to purr continuously. The hyoid of the Snow Leopard is only partly ossified and the vocal folds only slightly thickened, so that Snow Leopards are unable to roar, or to purr, continuously.

Credit: Peter Graham, International Snow Leopard Trust



Snow Leopard cub

Snow Leopards live in rugged mountainous terrain and are associated through most of their range with arid and semi-arid shrubland, grassland or steppe (Fox 1989; Jackson 1992). They are generally found at elevations between 3000 to 4500m, although they occasionally go above 5500m in the Himalayas, and can be found between 600 to 1500m at the northern limit of their range. They are extremely well-adapted for life in steep, high and rocky terrain, with short fore limbs, long hind limbs and large paws for walking on snow. Their tails are extremely long (up to 75-95% of the length of the rest of the body) and this adaptation not only assists balancing, but the thick tail can be wrapped around the body to protect the animal from the cold. An enlarged nasal cavity and well-developed chest allow Snow Leopards to cope with the cold, thin, high-mountain air and long body hair, with dense, woolly under-fur, traps warmth (Fox, 1989; Jackson, 1992; Nowell and Jackson, 1996).

Snow Leopards are known to live up to 21 years in captivity (Blomquist and Sten, 1982), but are unlikely to reach half of this age in the wild. Adult cats usually weigh between 35 and 55kg. They reach sexual maturity between two and three years old and mate in late winter. Litters, usually of to 2-3 young, are born in late spring.

Snow Leopards are opportunistic predators, capable of killing animals up to three times their own body weight (Schaller, 1977; Fox, 1989). There are regional differences in prey taken, but Snow Leopards most commonly hunt wild sheep and goats, such as Blue Sheep *Pseudois nayaur*, Argali *Ovis ammon*, Urials *Ovis vignei* and Siberian Ibex *Capra ibex*. Smaller animals, such as pikas *Ochotona* spp., zokors *Myospalax* spp. (also known as *sailongs*), and marmots



Argali skull - Argali sheep constitute important Snow Leopard prey

Marmota spp. also constitute important prey species, especially during the summer months (Schaller *et al.*, 1988). Predation on domestic livestock can be significant and, in several regions, this has been directly attributed to a decreased availability of wild prey and increased human and livestock encroachment into Snow Leopard habitat (Nowell and Jackson, 1996).

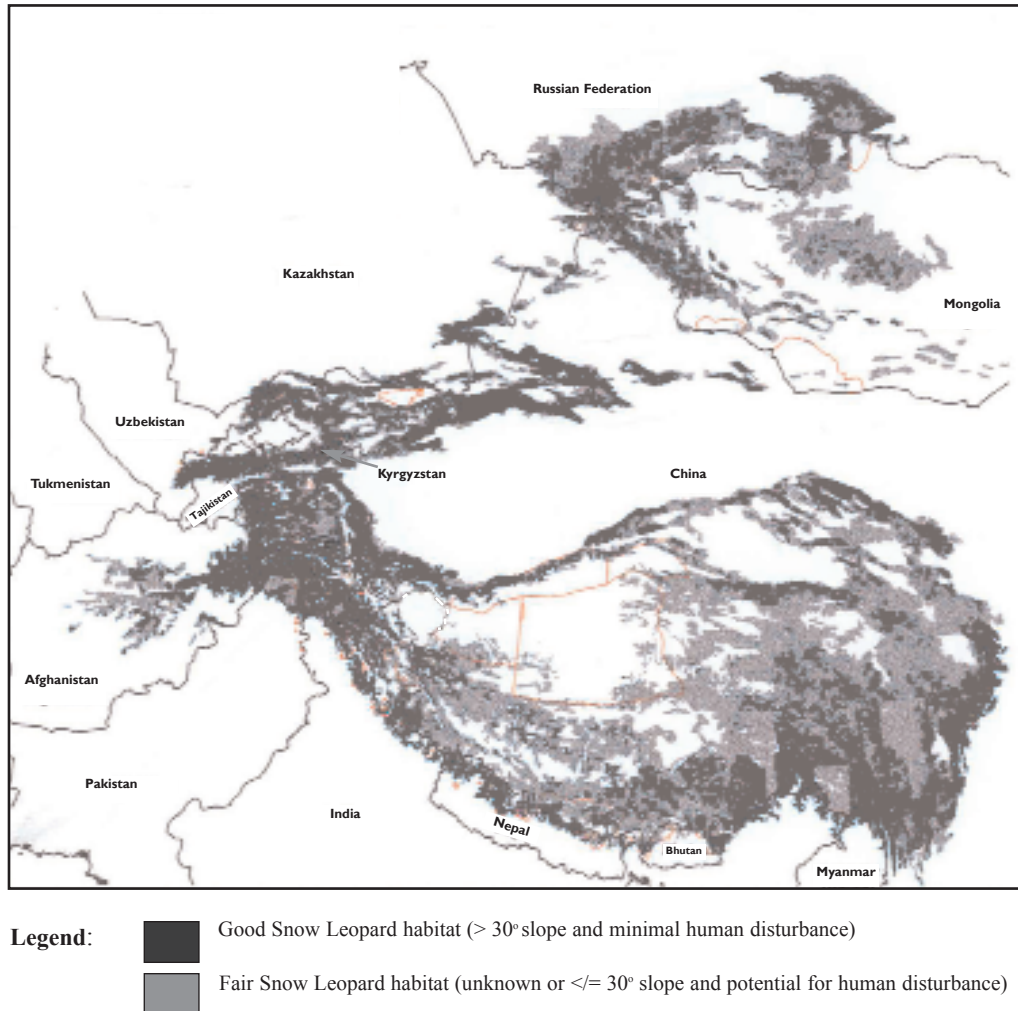
Distribution and population

Snow Leopards are distributed in relatively low numbers in the high mountain ranges of central Asia and the Himalayan region. They are most numerous in the Tibet (Xizang) Autonomous Region and other parts of China, but their range includes territories in eleven other countries: Afghanistan, Bhutan, Kazakhstan, Kyrgyzstan, India, Mongolia, Nepal, Pakistan, the Russian Federation, Tajikistan and Uzbekistan (see **Figure 1** and **Table 1**). The species is extinct in several areas of its former distribution. Snow Leopards have extremely patchy distribution and, although their range extends over a large area (more than 2.3 million km²), their fragmented populations occupy an area of no more than 1.6 million km² (Jackson and Hunter, 1996).

Worldwide population estimates for the species range between about 4000 and about 7000 animals. Country estimates are shown in **Table 1**, but it is important to note that these estimates were based on data collected several years ago and that some populations could be at lower levels than those shown in the table. There have been numerous reports of population declines in most parts of the species's range over the last decade. Snow Leopard numbers in Kyrgyzstan, for example, are reported to have decreased significantly since the early 1990s (Koshkarev and Vyrypaev, 2000). Any such declines would be of conservation concern: as long ago as 1975, the Snow Leopard was included in Appendix I of CITES, recognition that it was "threatened with extinction" (Anon., 1979). The species is also classified as Endangered in the 2002 *IUCN Red List of Threatened Species* (Anon., 2002b; Nowell, 2002) and has been so classified in IUCN Red Lists since 1988. According to the 2002 Red List, its predicted population trend is downward.

Figure 1

Map showing estimated global distribution of Snow Leopards *Uncia uncia*



Source: Nowell and Jackson 1996, based on Fox, 1994.

The following country sections provide more detailed distribution and population information for each of the 12 range States.

Afghanistan

Snow Leopards inhabit areas of the Hindu Kush range (in north-east Afghanistan). They are to be found in north-western and central parts of the mountain range, as well as easternmost parts, which extend into Wakhan, Badakhshan Province (Adil, 1997; Anon., 2003a). It is not known how many Snow Leopards are in Afghanistan, but based on an estimate of the available habitat, it has been calculated that there are around 100-200 of the animals (see **Table 1**). Snow Leopard tracks were recently observed during UNEP (United Nations Environment Programme) field missions in the Wakhan Corridor, an arm of land stretching eastwards between the borders of Tajikistan, Pakistan and China, forming the south-easternmost part of the greater Pamir

Table 1**Distribution and population estimates for Snow Leopards, by range State**

Range State	Area of habitat (km ²)	Estimated population	Source
Afghanistan	50 000	? (100-200)	figure derives from map-based estimate (Nowell and Jackson, 1996)
Bhutan	15 000	? (100-200)	figure derives from map-based estimate (Nowell and Jackson, 1996)
China	1 100 000	2000-2500	Schaller, 1990; Jackson, 1992
India	75 000	200-600	Chundawat <i>et al.</i> , 1988; Fox <i>et al.</i> , 1991
Kazakhstan	50 000	180-200	Annenkov, 1990; Zhirjakov, 1990
Kyrgyzstan	105 000	150-500	Koshkarev 1989, Koshkarev and Vyrypaev, 2000
Mongolia	100 000	800-1700	McCarthy, 2000
Nepal	30 000	300-500	Jackson and Ahlborn, 1990
Pakistan	80 000	200-420	Schaller, 1976 and 1977; Hussain, 2003
Russian Fed.	130 000	150-200	Poyarkov and Subbotin, 2002
Tajikistan	100 000	180-220	E. Bykova, B. Grebot, E. Kreuzberg-Mukhina, Institute of Zoology, Uzbekistan and London Imperial College, UK, <i>in litt.</i> , 2002
Uzbekistan	10 000	20-50	Kreuzberg-Mukhina <i>et al.</i> , 2002
TOTAL	1 846 000	4360-7240	

mountain range (Anon., 2003a). Wildlife in general is considered to have been affected by long-term environmental degradation in Afghanistan, exacerbated by two decades of conflict and a corresponding collapse of local and national forms of governance (Anon., 2003a).

Bhutan

Although no population surveys for Snow Leopards have been undertaken in Bhutan, anecdotal reports indicate that the species occurs at elevations of 4000-5000m in the northern parts of the country bordering the Tibet Autonomous Region of China. The Jigme and Dorji National Park

and the Kulongcchu Wildlife Sanctuary are the most important protected areas for Snow Leopards in Bhutan (Norbu, 1997). According to map-based estimates, 100-200 of the animals may inhabit Bhutan (see **Table 1**).

China

In China, Snow Leopards are found in the western mountain ranges of the Inner Mongolia, Tibet and Xinjiang Autonomous Regions and in the provinces of Qinghai, Gansu, Sichuan, Yunnan and Shanxi (Schaller *et al.*, 1988). Although Snow Leopards are more numerous in China than in other range States, recent field surveys conducted between 1996 and 2000 revealed that the historical distribution range of Snow Leopards had decreased, in particular in the provinces of Qinghai, Gansu and Sichuan (Ma *et al.*, 2002). It has been suggested that the species is likely to be on the brink of extinction in Inner Mongolia (McCarthy and Chaperon, 2003).

India

The Snow Leopard is known to occur above about 3200m across the Himalayan regions of India. Its range extends from Jammu and Kashmir, to Himachal Pradesh and Uttaranchal in the central Himalayas, to the eastern states of Sikkim and Arunachal Pradesh (Fox *et al.*, 1991). In the late 1980s, the total population of Snow Leopards in India was estimated at 200-600 animals, with the largest number inhabiting central Ladakh, in Jammu and Kashmir (Chundawat *et al.*, 1988). Fox *et al.*, (1991) estimated a nation-wide population of some 500 animals, based on mean density figures of one animal/110 km² for good habitat and one animal/190 km² for lower quality habitat.

Kazakhstan

In Kazakhstan, Snow Leopards occur on the edge of the high mountain ranges to the north and east of the country, in the Tien Shan mountains in the south-east, and possibly in a few isolated populations between these places and along the border with China (E. Bykova, B. Grebot and E. Kreuzberg-Mukhina, Institute of Zoology, Uzbekistan and London Imperial College, UK, *in litt.*, 2002). The most recent population estimate of 180-200 animals dates from 1990 (see **Table 1**). However, the population is thought to be in decline, according to the country's Red Data Book (Anon., 1996a).

Kyrgyzstan

Kyrgyzstan used to have one of the largest Snow Leopard populations. In the late 1980s, what is now Kyrgyzstan and neighbouring Tajikistan were estimated to have 1200-1400 of the animals. At the time, this represented around 75% of all Snow Leopards in the Soviet Union (Koshkarev, 1989), but dramatic declines in numbers in the region have been reported since then. Koshkarev (1994) estimated that populations in Kyrgyzstan and Tajikistan were reduced by 50-80% in the 1990s and estimated that up to 120 animals were killed a year in the mid-1990s. In Kyrgyzstan, as few as 150-200 mature individuals may remain, but no recent population figures are available and, since the independence of Kyrgyzstan, no systematic population surveys have been undertaken (Anon., 2001a).

Mongolia

The Snow Leopard is distributed in mountainous areas in the west of Mongolia. These include the Altai Mountains and some isolated mountainous sections in the south-west of Mongolia, close to the border with China (Schaller *et al.*, 1994; McCarthy, 2000). Additionally, remnant populations occur in the Hangayn Nuruu, mountains trending north-west to south-east, occupying much of central-west Mongolia, and possibly in the mountains of Hovsgol Province, in northern Mongolia, although, according to Schaller *et al.* (1994), no Snow Leopards have been sighted there since the 1960s. The total range of the species in Mongolia is around 80 000 to 100 000 km² (McCarthy, 2000), but the Snow Leopard populations in Mongolia have an extremely patchy and fragmented distribution, which may reduce genetic interchange and thus diminish their long-term viability. Estimates of the number of Snow Leopards in Mongolia from the 1970s and 80s ranged between 500 to 900 (Bold and Dorzhzunduy, 1976) and 2000 to 4000 (Marechal, 1986). McCarthy (2000) reports that population estimates vary between 800 and 1700 animals, with a density of around 1-1.5 Snow Leopards per 100 km².

Nepal

Snow Leopards are found in the Nepalese Himalayas, along the border with the Tibet Autonomous Region of China. Their distribution seems to be localized in the western half of this area: the species is reported to occur in



Credit: Rodney Jackson, Snow Leopard Conservancy

Manang District, in western Nepal, and in Mugu and Dolpa Districts, in the far west. There are also unverified reports of Snow Leopards elsewhere in Nepal, including in Mustang District, some 70km north of Annapurna (Dhungel, 1994). Snow Leopards occur in eight protected areas in Nepal, but the number in each is unknown. The largest population is thought to exist in Nepal's largest national park, the Shey-Phoksundo National Park (covering parts of Mugu and Dolpa Districts) and in the Annapurna Conservation Area (Bajimaya, 2000). Nepal's total Snow Leopard population was estimated by Jackson and Ahlborn (1990) to number 300-500 animals, but no recent national surveys have been undertaken.

The Langu River valley, a remote and rugged part of the Himalaya in the western part of the Shey-Phoksundo National Park, in far west Nepal. This area is virtually unpopulated by humans and ungrazed by livestock and provides pristine Snow Leopard habitat.

Pakistan

Snow Leopard habitat in Pakistan is spread over an area of 81 000 km², in the Hindu Kush mountains (close to the Afghani border) and in the Himalaya and Karakoram mountain ranges - all in the far north of the country. In terms of administrative areas, the species occurs in all five districts of the Northern Areas, in the Chitral, Dir, Swat and Kohistan Districts of the North West Frontier Province, and in Muzaffarabad District, in Azad Jammu and Kashmir (Ahmad, 1994; Hussain, 2003). Less than seven per cent of this area is protected for wildlife. Recent information on the numbers of Snow Leopards in Pakistan is lacking. Based on surveys undertaken in the early 1970s, Schaller (1976) estimated the total population of Snow Leopards in Pakistan to be around 150 to 200 animals. Malik (1997) reported that the number could be around 400 animals. Recent surveys undertaken in the Balistan District of the Northern Areas resulted in an estimate of 90-120 animals in that District and 300-420 animals throughout Pakistan (Hussain, 2003).

Russian Federation

The historic range of the species was considerably larger than now and ranged from the Altay mountain range, in the central south of the country, to the Lena River, in eastern Siberia. However, since the early twentieth century, the species has been absent from several areas of this range, especially in the south-western parts and most probably in the Baykal and Transbaykal regions (Koshkarev, 1998). The Snow Leopard's range now spans mountain groups in the central south of the Russian Federation, from the Altay mountains, east through the Sayan mountains and the Republic of Tyva, to the Tunkinskiye and Kitoiskiye mountains, just west of the southern tip of Lake Baykal. This area now forms the northernmost limit of the Snow Leopard's global range. Certain areas of this range are heavily impacted by deforestation



Credit: © WWF Russia / Victor Lukarevski

Snow Leopard habitat in the mountains in the Altay-Sayan region, which form the western part of the Snow Leopard's range in the Russian Federation

and human encroachment, which have led to increased fragmentation of populations, and possibly to isolation of western populations from those in the east.

Between 150 and 200 Snow Leopards are estimated to live in the Russian Federation, according to comprehensive surveys undertaken in 2000 and 2001 (Poyarkov and Subbotin, 2002).

Tajikistan

In Tajikistan, Snow Leopards are found in the mountains in the east of the country, the main population occurring in the Pamir region, in isolated patches of relatively good habitat (Buzurukov and Muratov, 1994). Snow Leopards in Tajikistan are listed in the Red Data Book³, as 'rare' (Abdusaliamov, 1988). Little is known about the current status of the Snow Leopard in Tajikistan, but populations are thought to be in decline. In 1990, Sokov estimated the total population of Snow Leopards in Tajikistan at around 200-300 animals, but this figure has been considered an over-estimate and others put the total population at 80-100 or 120-300 animals (Buzurukov and Muratov, 1994). A more recent population estimate for Tajikistan suggests that the total population is around 180-220 animals (E. Bykova, B. Grebot and E. Kreuzberg-Mukhina, Institute of Zoology, Uzbekistan and London Imperial College, UK, *in litt.*, 2002.).

Uzbekistan

Snow Leopards are known to occur in the eastern parts of Uzbekistan, in the mountains bordering Kyrgyzstan and Tajikistan, where they have been reported from the Turkestanskiy, Chatkalskiy and Gissarskiy ranges. The number of Snow Leopards in Uzbekistan is estimated to be no more than 20-50 (Kreuzberg-Mukhina *et al.*, 2002).

LEGAL STATUS AND REGULATION

At international level

CITES

Snow Leopards have been included in Appendix I of CITES since 1975 and hence all international commercial trade in the species, its parts and derivatives is prohibited in those countries which are Parties to this Convention. This includes all Snow Leopard range States apart from Kyrgyzstan and Tajikistan, although some range States joined the Convention only recently and in others CITES is not fully implemented (see **Table 2**). Afghanistan, for example, which joined CITES in 1986, has yet to submit an annual report.

Other provisions of CITES relate to Snow Leopards, notably the following, adopted at the twelfth meeting of the Conference of the Parties to CITES, in November 2002:

- *Resolution Conf. Res. 12.5 on the Conservation of and trade in Tigers and other Appendix-I Asian big cat species.* This Resolution of the CITES Parties formally recognizes that all Asian big cats are threatened by illegal use and trade. It calls upon CITES Parties to improve efforts to combat the illegal killing of, and trade in, Asian big cats, at national, regional and international levels.

- *Decision 12.29*, which requests Parties to communicate details of any “significant illegal shipment of Asian big cat parts or derivatives” and to conduct appropriate investigations.
- *Decision 12.30*, which requests that Asian big cat range State Parties consider ways in which local communities might be encouraged to play a part in, and benefit from, the conservation of Asian big cats and their habitats, for example through eco-tourism.

Table 2

Multi-lateral environmental agreements applying to Snow Leopard range States

Country	Party to CITES	Date of entry into force	Category under NLP ¹	Party to CMS ²	Date of entry into force
Afghanistan	Yes	Jan. 1986	3	No	-
Bhutan	Yes	Nov. 2002		No	-
China	Yes	April 1981	2	No	-
India	Yes	Oct. 1976	2	Yes	Nov. 1983
Kazakhstan	Yes	Jan. 2000	Under review	No	-
Kyrgyzstan	No	-		No	-
Mongolia	Yes	April 1996	3	Yes	Nov. 1999
Nepal	Yes	Sept 1975	3	No	-
Pakistan	Yes	July 1976	3	Yes	Dec. 1987
Russian Federation	Yes	Jan. 1992	2	No	-
Tajikistan	No	-		Yes	Feb. 2001
Uzbekistan	Yes	Oct. 1997	3	Yes	Sept. 1998

Notes: ¹ = National Legislation Project of CITES. Category 1 legislation is believed to meet the requirements for the implementation of CITES; Category 2 legislation is believed not to meet all requirements; Category 3 legislation is believed not to meet the requirements. ² CMS = the Convention on Migratory Species of Wild Animals.

Sources: Document *Doc. 28*, presented at the twelfth meeting of the Conference of the Parties to CITES, November 2002; www.cites.org; and <http://www.wcmc.org.uk/cms/>

The Convention on Migratory Species of Wild Animals

The Snow Leopard has been listed in Appendix I of the Convention on Migratory Species of Wild Animals (CMS) since 1985. Five of the twelve Snow Leopard range States are Parties to CMS (see **Table 2**). For Appendix I species, CMS Parties are requested to:

- conserve and restore habitat;
- prevent, remove, compensate or minimize adverse effects of activities or obstacles that seriously impede migration; and
- prohibit the taking of animals and prevent, reduce or control factors that are endangering or are likely to further endanger the species.

At the seventh Conference of the Parties to CMS (September 2002), the Snow Leopard attained the status of a species designated for “concerted and co-operative actions” for its conservation (Anon. 2002c; d).

BOX I

CITES-REPORTED TRADE IN SNOW LEOPARDS

Although the Snow Leopard is an Appendix I species under CITES, and therefore international commercial trade of wild specimens is not permitted, transfer between countries is allowed for specific purposes, such as exchange between scientific institutions (including zoos), non-commercial loan and donation. Further, commercial trade in captive-bred specimens of Appendix I species is allowed under CITES, providing the relevant breeding facilities have been inspected, and their operations approved, by a country's CITES Management Authority. In all instances of trade in Appendix I species, the relevant authorities in the countries of export (or re-export) and import have to issue CITES permits before trade can take place and, in this way, it is possible to track the movement of specimens.

Table I shows the numbers of Snow Leopard specimens reported in international trade between 1975 and 2000, based on CITES trade data. These data are based on imports, exports and re-exports reported by CITES Parties to the CITES Secretariat. Reporting inaccuracies and omissions mean that these data are likely to be far from complete and should rather be considered as an indication of trade levels.

Table A

International net trade in Snow Leopards between 1975 and 2000, as reported by CITES Parties

Year	Live	Skins	Garments	Trophies	Specimen	Bodies	Skeletons
1975	1						
1976	1					1	
1977	3						
1978	14	1					
1979	4	45***	2				
1980	11						
1981	17			3			
1982	12				1		
1983	14		1				
1984	25						
1985	15						
1986	15	1					
1987	15						
1988	18	2				4	
1989	31				12		
1990	36						
1991	16				345*		
1992	27	1			170**		
1993	23					1	
1994	23				34	1	
1995	9				1		
1996	8						
1997	22					2	
1998	23	1			1		
1999	5	2			6		2
2000	15						
Total	402	53	3	3	570	9	2

Notes: * refers to Snow Leopard scat samples; ** refers to semen samples in ml; *** refers to pre-Convention specimens. Blanks denote no trade reported.

Source (for Tables A, B and C): CITES trade data, compiled by the UNEP World Conservation Monitoring Centre (UNEP-WCMC) in 2002.

Twenty-five of the 402 live Snow Leopards reported in international trade between 1975 and 2000 (**Table A**) were declared to be exports from range States. Of these, only two were declared as taken from the wild, one exported from Kazakhstan to Japan, in 2000, for captive breeding purposes, and the other exported from the Russian Federation, via Kyrgyzstan, to Germany, for scientific purposes, also in 2000. Most (339) of the 402 Snow Leopards were declared as captive-bred. Snow Leopards are being successfully bred in captivity and, according to the Snow Leopard Species Survival Plan (SSP) programme of the American Zoo and Aquarium Association (AZA), there were over 600 captive-bred Snow Leopards in zoos worldwide, in 2002. About 275 of these are in captivity in the USA (Anon., 2003b). Of the 339 live animals traded as captive-bred specimens, six were declared as F1-generation and for 54 specimens no source was reported.

Table B shows the reported purpose of transaction for live Snow Leopards between 1975 and 2000 and **Table C** the ten most important importing and exporting Parties for the same. CITES data show that 31 of the 33 specimens traded for commercial purposes were captive-bred: one of the remaining two was declared as a 'pre-Convention specimen' and no source was reported for the other.

Table B

Reported purpose of transaction for live Snow Leopards traded between 1975 and 2000

Purpose	No. of specimens
Zoos	270
None declared	68
Commercial trade	33
Breeding in captivity	20
Scientific	6
Circus and travelling exhibition	5
Total	402

Table C

The ten most important importers and (re-)exporters of live Snow Leopards between 1975 and 2000

Importers	Quantity	Exporter (or re-exporter)	Quantity
UK	48	Switzerland	83
France	33	USA	69
USA	32	Finland	48
Germany	29	Germany	44
Poland	25	UK	29
Japan	23	Soviet Union	23
Canada	23	Canada	17
Russia	16	Netherlands	13
East Germany	14	Sweden	9
China	13	Japan	8
Other States	146	Other States	59
Total	402	Total	402

Note: East Germany has been part of Germany since 1990.

Reported seizures in CITES data

The following seizures were reported in CITES data, compiled by UNEP-WCMC in 2002.

- one garment, seized in Canada, 1983, country of export not known.
- one garment, seized in the USA, exported from France in 1985.
- one garment, seized in 1986, exported from China.
- one Snow Leopard skin, exported from the UK, seized in 1990.

At national level

Snow Leopards are protected by law in each of the 12 range States, with the possible exception of Afghanistan (see below). However, in some countries the relevant legislation may not always be effective. For example, in Pakistan, protective legislation for Snow Leopards is not applied at the national level and, according to the CITES National Legislation Project, the legislation of Afghanistan, Mongolia, Nepal, Pakistan and Uzbekistan was “believed to generally not meet the requirements for the implementation of CITES” (Anon., 2002e).

Afghanistan

No up-to-date information is available on the legal status of Snow Leopards in Afghanistan. After the military intervention in Afghanistan, launched after 11 September 2001, the Agreement on Provisional Arrangements in Afghanistan Pending the Re-establishment of Permanent Government Institutions, signed in Bonn, December 2001, (the “Bonn Agreement”) established the Afghan Interim Authority (Anon., 2003a). Under this authority, the country’s legal system still operates within the context of the constitution enacted by the monarchy in 1964. Existing laws stand, provided that they are not inconsistent with the Bonn Agreement. In this regard, the *Nature Protection Law* of 1986 (amended in 2000) and the *Hunting and Wildlife Protection Law* of 2000 provide an important framework for governance, but a post-conflict environmental assessment undertaken by UNEP in 2002 concluded that, “the legal status of all protected animals in Afghanistan is currently in question and no management is taking place to protect and conserve their ecological integrity” (Anon., 2003a). A project has been initiated with the participation of UNEP to draft legislation for environmental protection (Baker, 2002), but this legislation has not yet been developed. In the absence of new environmental laws, the transitional authority in Afghanistan has issued various decrees banning hunting and timber harvesting, but difficulties have been reported in the enforcement of these decrees (Anon., 2003a).

Bhutan

The hunting of Snow Leopards is prohibited in Bhutan through the *Forest and Nature Conservation Act, 1995*. Killing of a Snow Leopard can result in a fine of BTN15 000 (approximately USD309), which is among the highest fines for killing an animal in Bhutan and equal to about twice the annual cash income of a wildlife warden (around BTN7000 or USD150) (D. Yonten, Nature Conservation Division, Department of Forestry of Bhutan, *in litt.*, May 2003).

China

The *Wildlife Animal Protection Law (WAPL) of the People’s Republic of China (1989)* and the *Enforcement Regulations for the Protection of Terrestrial Wildlife of the People’s Republic of China (1992)* are the two principal laws providing full protection to Snow Leopards in China. The species is listed as a Class I protected animal under the *WAPL*, which means that:

- hunting of Snow Leopards constitutes a criminal offence and
- sale and purchase of Snow Leopards or their products is strictly prohibited (although scientific research, domestication, breeding, or exhibition is allowed with a permit (O’Connell-Rodwell and Parry-Jones, 2002).

The *Criminal Law of the People's Republic of China*, last amended in 1997, provides severe penalties for unlawful taking, killing, transporting, purchase or selling of State-protected animal species, such as the Snow Leopard. Depending on the severity of the crime this can result in a prison sentence of more than 10 years, a fine and the confiscation of property (H. Xu, *TRAFFIC East Asia, in litt.*, 2003).

Provinces may also adopt their own wildlife protection regulations, which may be more, but not less, stringent than the national legislation.

India

The Snow Leopard is protected in India under the national *Wild Life (Protection) Act, 1972* as well as under the *Jammu and Kashmir Wildlife (Protection) Act, 1978*. The species is listed on Schedule I of both laws, with the effect that hunting is generally forbidden. In 1986, the former act was amended through the inclusion of a new chapter that prohibited trade in all its scheduled species. The maximum penalty for offences concerning animals listed in Schedule I of the Act is seven years' imprisonment and a fine of INR25 000 (USD516). The *Jammu and Kashmir Wildlife (Protection) Act* was amended in 2002, so that all trade in scheduled animals or their parts became illegal and carried the same penalties as under the national *Wildlife Protection Act* (M. Misra, *TRAFFIC consultant, in litt.*, 2002). Until the amendment of 2002, punishment for such trade under the Jammu and Kashmir law had been at a lower level (a maximum of six years' imprisonment and a fine of INR2000). Trade in Snow Leopard skins continued in Jammu and Kashmir until the end of the 1990s, because of loopholes in the legislation and a long-pending court case in the Supreme Court of India against the general ban on trade in any part derived from protected scheduled species (Panjwani, 1997).

Kazakhstan

The Snow Leopard is protected in Kazakhstan under the *Law on Wildlife Protection* of January 1993 and this prohibits hunting, possession and sale of the species. The maximum fine for the illegal hunting of Snow Leopards in Kazakhstan is KZT150 000 (USD1000) (Y. Yuchenkov, *Katon-Karagay State National Park, in litt.*, 2002).

Kyrgyzstan

Hunting, possession and trade of Snow Leopards is prohibited in Kyrgyzstan through the *Law on the Animal World (1999)*. The maximum fine for the illegal killing of Snow Leopards is KYS63 000 (USD1300), coupled with up to three years' imprisonment. In addition, the authorities may confiscate the specimen (Anon., 2001b). The species is listed in the Red Data Book of Kyrgyzstan (Anon., 1985)³, which has formed the legal basis for the development of protection measures in the country.

Mongolia

Hunting Snow Leopards has been prohibited since 1972, when the species was listed in the Mongolian Red Data Book as 'very rare'. Limited sport hunting of Snow Leopards under an annual quota was allowed until 1995 (O'Gara, 1988), but was prohibited following the growing

protest of conservation groups (Tserendeleg, 1997). The *Hunting Law* of 1995 now prohibits the hunting or trapping of Snow Leopards and the selling of any Snow Leopard part. Until April 2000 there was no legal restriction on purchasing, owning, or possessing Snow Leopard parts, but after strong lobbying activities by several conservation non-governmental organizations (NGOs), the *Hunting Law* was revised and the *Law of Fauna (2000)* was enacted. This law specifically prohibits the sale or purchase of any Snow Leopard part. In addition, the law includes provisions to provide “whistle-blowers” with 15% of fines paid by offenders. The penalty for killing an endangered animal is twice the economic value of the species. Following a governmental decision, the Snow Leopard’s economic value has been set at MNT500 000 (USD450), according to a “List of Rare Animals and Wild Animal Ecology-Economic Valuation”. By contrast, however, the value of the Argali is fixed at many times this amount, at MNT9 000 000 (USD8060) and the values of ibex and deer are on a par with that of the Snow Leopard, at MNT500 000 (USD450).

In 1999, the *Mongolian Snow Leopard Conservation Management Plan* was developed by WWF Mongolia, the International Snow Leopard Trust and other stakeholders, in co-operation with the relevant governmental agencies. However, the Plan is not yet fully recognized as an official policy document by the Mongolian Government (McCarthy and Chapron, 2003).

Nepal

The Snow Leopard has been fully protected in Nepal under the *National Parks and Wildlife Conservation (NPWC) Act 2029* since 1973. Under the Fourth Amendment of the Act it is illegal to hunt, acquire, buy or sell Snow Leopard parts and the penalties for persons convicted of such offences range from NRS50 to NRS100 000 (<USD1-USD1300) or from five to fifteen years in prison. Nepal has also established incentives for “whistle-blowers” and there is a provision for NRS50 000 to be paid for information that leads to the conviction of an offender (Kattel and Bajimaya, 1997).

Pakistan

There is no law applied for the protection of Snow Leopards nationally in Pakistan. However, provinces have their own wildlife laws (J. Khan, *in litt.*, 2002) and the Snow Leopard is legally protected in the three States of Pakistan where it occurs - North West Frontier Province, the Northern Areas and Azad Jammu and Kashmir.

The *NWFP Wildlife Act* of 1975, (pertaining to North West Frontier Province) prohibits the hunting, capturing and killing of any ‘protected animal’. Section 14 of the Act, specifically refers to trade and prohibits the trade and/or sale of Snow Leopards, their trophies and meat (Khan, 2002a). The maximum penalty for violations of this Act is two years’ imprisonment and/or a fine of PKR1000 (approximately USD17).

In the Northern Areas, Snow Leopards are protected through the *Wildlife Conservation Act of the Northern Areas* and hunting of Snow Leopards is prohibited. However, there is a provision under section 22 of the Act that sanctions the eradication of so-called “problem animals”. Under this provision, a designated official of the wildlife department or a private individual can eradicate an animal that threatens private property or human life. In cases where an animal

inflicts damage to property, however, such as livestock, there is no mechanism for compensation to the affected individual (Hussain, 2003).

In 2001, government agencies, conservation NGOs and other stakeholders met to develop a strategic plan for the conservation of Snow Leopards in Pakistan that would serve as a guiding tool for agencies and organizations participating in the conservation of Snow Leopards. It was expected to gain full acceptance as an official policy of the Government of Pakistan in 2002.

Russian Federation

At federal level there are three main laws that apply to Snow Leopard protection: the *Law of Environment Conservation*, the *Law of the Animal World (fauna)*, No 52, of March 1995 and the *Law of Strictly Protected Natural Areas*, No 33, of 15 February 1995. The Snow Leopard is also included in the Red List of the Russian Federation and the *Law of the Animal World* makes special reference to this. The maximum fine that can be imposed for the killing, illegal possession and trade of Snow Leopards, under paragraph 258 of the Criminal Code, is up to two years' imprisonment. From the mid-1990s, WWF Russia facilitated the development of a Snow Leopard conservation and management plan, in co-operation with several governmental and non-governmental agencies and, in 2002, the *Strategy for the Conservation of the Snow Leopard in the Russian Federation* was officially approved by the Head of the State Service for Environment Protection (Anon., 2002a).

Tajikistan

The species is protected under the *Law on Nature Protection* (1993) and the *Law on Preservation and Use of Fauna* (1994) (Safarov and Novikov, 2000). The maximum fine for the illegal killing of a Snow Leopard is the equivalent of ten times the minimum monthly wage of the offender (M. Kadamshoev, Pamir Institute of Biology, *in litt.*, 2002).

Uzbekistan

The Snow Leopard is protected in Uzbekistan under the *Law on Nature Protection* of January 1993 and hunting, possession and sale is prohibited. The maximum fine for violations of this law is 50 times the minimum wage of the offender or two years' imprisonment (E. Kreuzberg-Mukhina, Institute of Zoology, Uzbekistan, *in litt.*, 2002). The species is included in the Red Data Book³ for Uzbekistan (Kreuzberg-Mukhina *et al.*, 2002).

Enforcement problems

Legislation to protect Snow Leopards exists in every range State, as described. In some cases, the legislation itself is inadequate, but in many cases, it is enforcement of legislation that is obstructing Snow Leopard conservation. Enforcement of legal measures to protect Snow Leopards remains a major challenge for most range States.

Snow Leopard habitat is characterized by its remoteness and rugged nature. This presents a particular obstacle to law enforcement for protection of the Snow Leopard. Even within established national parks, effective patrolling is obstructed by the physical nature of the terrain.

Law enforcement is also often impeded by a lack of awareness and/or a lack of the political will necessary to carry out prosecutions. In many of the Snow Leopard range States, environmental conservation comes especially low on the list of national priorities, in the wake of economic and political upheaval, for example in the case of Afghanistan and those countries formerly part of the Soviet Union. In Tajikistan, for instance, laws are reportedly not obeyed and effective enforcement has been described as generally non-existent (M. Kadamshoev, Pamir Institute of Biology, *in litt.*, 2002), while in Uzbekistan, law enforcement, especially in the field of nature protection, is said to be low (E. Kreuzberg-Mukhina, IUCN National Committee/Academy of Science, Uzbekistan, *in litt.*, 2002). Low rank accorded to species conservation at governmental level means that wildlife rangers and enforcement personnel will often be poorly equipped and live on low wages. This in turn can give rise to a fertile breeding ground for corruption, which plays a considerable role in confounding the efforts of some range States to tackle wildlife crime effectively, as remuneration for enforcement officials may seem especially paltry compared with the earnings to be made from trading in Snow Leopard skins and other parts (see **Table 3**) (Anon., 1999).

TYPES OF THREAT POSED TO SNOW LEOPARDS

According to the survey of more than 60 Snow Leopard specialists, undertaken by the Snow Leopard Survival Strategy (see **Methods**), direct killings of Snow Leopards and loss of their natural prey base are considered to be the most significant threats to the long-term survival of the species (McCarthy and Chapron, 2003). The survey results testified to considerable differences in the type of threat posed between geographic regions. Most notably, a divide exists between the Himalayan region - Bhutan, India, Nepal and the Tibetan and other parts of southern China, and the central Asian region - Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan and the Xinjiang Autonomous Region of China. Killings of Snow Leopards in retribution for livestock depredation were identified as a significant threat in the Himalayan region and in the Karakoram and Hindu Kush mountains. By contrast, poaching of Snow Leopards for trade was considered the main threat to the species in the central Asian region and northern range of the species - in the Chinese Altai mountains and Tien Shan mountains (Xinjiang Autonomous Province), Mongolia and the Russian Federation (McCarthy and Chapron, 2003).

In many cases, the different types of threat are related and sometimes closely interwoven, which makes it difficult to identify baseline causes and effects. For example, over-grazing by domestic livestock may lead to competition with, and eventually loss of, wild ungulates, a major prey source for Snow Leopards. In turn, such reduction of wild prey often leads Snow Leopards to prey on domestic livestock, which sets up a negative perception of the cat among herders, who then become motivated to kill Snow Leopards in retaliation for, or prevention of, attacks on livestock.

Despite this complexity, it is important that the separate factors influencing threats to Snow Leopards are identified and carefully assessed to ensure that remedial approaches for reducing such threats are appropriate.

Loss of natural prey base

Wild ungulates, such as Argali, ibex or Blue Sheep, are adversely affected by over-grazing of land through increased competition with domestic livestock in parts of the Snow Leopard's

range. In Nepal, for example, wild ungulates are sometimes seen as direct competitors with livestock as they may graze in the same areas (Oli *et al.*, 1994).

Hunting of Snow Leopard prey species, for subsistence or for financial gain, also affects their number and poaching of wild ungulates for subsistence is particularly problematic in some of the central Asian republics, where the livestock population has decreased several-fold since the break up of the Soviet Union (Koshkarev and Vyrypaev, 2000). Unmanaged - though legal - hunting of marmots to supply national and international fur markets has led to local declines in populations of this Snow Leopard prey species in Pakistan, Kyrgyzstan and Mongolia (Koshkarev, 1994; Khan, 2002a). In the Tibet Autonomous Region, the increased hunting of pikas and *sailongs* has also led to a reduction of these important Snow Leopard prey species. The Plateau Pika *Ochotona curzoniae* and *sailongs* are considered “keystone species” on the Qinghai-Tibet (Tibetan) Plateau (Smith and Foggin, 1996; Wang *et al.*, 1993), but they are seen as vermin among local people and poisoned (Miller and Jackson, 1994). The alleged reasons for these control measures are that populations of the rodents may reach high densities and damage crops and reduce forage for domestic livestock (yaks, sheep or horses) correspondingly, and because they may be responsible for habitat degradation (Smith and Foggin, 1996; Nowak, 1997). The demand for *sailong* bones for use in traditional Chinese medicines has increased since this alternative was promoted by the Government of China after the manufacture of Tiger-bone medicines was prohibited in that country in the mid-1990s (Nowell, 2000; Chang and But, 2001).



Credit: Tom McCarthy, International Snow Leopard Trust

Poached ibex horns in the Altai Mountains of Mongolia. Ibex are amongst the ungulates which make up the Snow Leopard's wild prey.

Whatever the reasons for a reduction in Snow Leopard prey, the effects may be indirect as well as direct, as a shortage of natural prey can lead to increased predation on domestic livestock, which in turn may provoke herders to kill Snow Leopards (McCarthy and Chapron, 2003). For this reason, destruction of the habitat of Snow Leopard prey species may affect the predator more seriously than direct impacts on its own habitat.

Conflict with herders

Killings of Snow Leopards in response to, or in prevention of, livestock losses were reported as the other prime danger to the species (besides loss of prey). Numbers of Snow Leopards affected can be considerable and resentment among herders high. As an indication, at least 16 Snow Leopards were reported killed in Zaskar (Zanskar), in northern India, between 1996 and 2002, eight in one village alone, (Spearing, 2002). The killings either followed actual attacks on livestock or were the result of general hostility towards Snow Leopards borne of previous or expected attacks. Most herders interviewed in Zaskar felt that Snow Leopards should be eradicated, because they were nuisance animals (Spearing, 2002). Similar numbers of Snow Leopards are killed each year in Pakistan's Northern Areas (especially in Baltistan and Hunza), in parts of Nepal's remote west and in certain areas on the Tibetan Plateau (R. Jackson, Snow Leopard Conservancy, *in litt.*, 12 July 2003).

The tendency of Snow Leopards to remain at the killing site to consume their prey increases their vulnerability to retaliatory killings by herders. Moreover, in some areas, for example in Ladakh, in India, livestock herders are known to have acted pre-emptively by removing Snow Leopard cubs from their dens, to try and limit future damage to their livestock (Fox, 1997). Although the cubs are often delivered to local wildlife protection personnel, most of them die after failed attempts to return them to their mother.

Although reported losses of domestic stock to wolves are sometimes higher than those attributed to Snow Leopards, wolves are not necessarily as keenly hunted by herders, as they more frequently take smaller livestock, such as sheep and goats, whereas Snow Leopards also take larger domestic animals, such as horses (McCarthy, 1999; R. Jackson, *in litt.*, 12 July 2003). Moreover, herders in Afghanistan reported that Snow Leopards were more likely than wolves to enter a corral and, therefore, to do more damage to livestock (Anon., 2003a).

Costs of depredation

Snow Leopard attacks on domestic livestock can amount to a considerable economic loss for herding communities (Jackson, 1991; Oli *et al.*, 1994; Jackson, 1999, Spearing 2002). A survey in the Tsarap valley, in Zaskar, calculated that the average loss to Snow Leopards, per household, in 2000-01 was 1.42 domestic animals, or INR2537 (USD54). Considering that the average household income in that area is calculated at approximately INR17 784 (USD378), the cost of Snow Leopard predation is clearly burdensome and threatens the livelihood of the herding families. It should be borne in mind that only one-third of these families have any permanent source of income and that the average family in the area needs to spend about INR6000 (approx. USD130) each year on essential commodities (Spearing, 2002). Similarly high costs in relation to family income are reported from other areas of the Snow Leopard's range. Interview surveys conducted by McCarthy (1999) among 105 herders in four provinces in Mongolia (Govĭ-Altay, Hovd, Bayan-Ölgiy and Uvs) concluded that, on average, 57 head of livestock a year were lost in Snow Leopard attacks. Overall, 70% of the losses were large animals - horses or yaks - and it was calculated that the damage amounted to a monetary value of around USD47 per household affected. This was equivalent to between six and 10 per cent of the annual income of a herder family (USD470-783), or the cash value of a horse (see **Table 3**). In Nepal, interviews in the Annapurna Conservation Area revealed that 72 animals were lost to

Table 3

Overview of the average cash income of people living in areas of Snow Leopard habitat, the value of livestock and the maximum penalty for illegal killing of a Snow Leopard in each range State

Country	GNI* in USD (2001)	Average annual cash income of wildlife ranger/herder (in USD)	Approximate cost of typical livestock (in USD)	Maximum penalty for killing a Snow Leopard
Afghanistan	n/a.	414-624 (herder)		
Bhutan	640	150 (ranger)	Horse: 158; Yak: 252 Cattle: 105-210 Sheep: 53	BTN15 000 (USD309)
China	890	Xinjiang: 227 (herder) Xizang 172 (herder)	Yak: 122-244 Camel: 183-244 Cattle: 183-305 Sheep/goat: 24-60	Imprisonment of up to 10 years or more and a fine
India	460	378-638 (herder)	Sheep/goat: 21 Horse: 170 Yak: 213	INR25 000 (USD516) and up to seven years' imprisonment
Kazakhstan	1350	360-480 (ranger)	Sheep: 15-35 Horse: 200-300	KZT150 000 (USD1000)
Kyrgyzstan	280	120 (ranger)		KYS63 000 (USD1300) and up to three years' imprisonment
Mongolia	400	600 (herder)	Camel: 100-130 Cattle: 88; Goat: 8-12 Yak: 60-70 Horse: 40-50 Sheep: 10-18	MNT1 000 00 (USD900)
Nepal	250	252 (herder)	Sheep/goat: 3-5	Up to NRS100 000 (USD1300) or five to fifteen years in prison
Pakistan	420	In Chitral: 200-430 (herder) (average herding size 300-500 goats)	Yak: 138-242 Cattle: 121 156 Goat: 26-78 Sheep: 9-26	PKR1000 (USD17) or two years' imprisonment
Russian Fed.	1750	366-720 (wildlife ranger)	Sheep/goat 50 Horse: 264-325 Yak: 325-494 Camel: >494	Seven times the monthly salary of the offender or up to two years' imprisonment
Tajikistan	180	120 (herder)	Cattle: 100 Sheep: 30; Goat: 25	Ten times the min. monthly wage of the offender
Uzbekistan	550			50 times the minimum wage of the offender or two years' imprisonment

Note: * GNI is gross national income. Blanks in the columns denote "no information".

Sources: World Development Indicators Database, April 2003 and (for columns three and four) Afghanistan: Ghulam Ahmad Malakyar, Executive Director, Save the Environment Afghanistan, *in litt.*, 2003; Bhutan: D. Yonten, Nature Conservation Division, Department of Forestry of Bhutan, *in litt.*, 2003; China: Xu Hongfa, TRAFFIC East Asia, *in litt.*, 2003; Kazakhstan: Yevgeniy Yurchenkov, UNDP-GEF programme Altai-Sayan, *in litt.*, 2003; Kyrgyzstan: E. Koshkarev, Altai State University, *in litt.*, 2003; India and Nepal: M. Misra, TRAFFIC consultant, *in litt.*, 2003; Mongolia: B. Munkhtsog, International Snow Leopard Trust-Mongolia, *in litt.*, 2003; Russian Federation: A. Shestakov, TRAFFIC Europe-Russia and E. Koshkarev, Altai State University, *in litt.*, 2003; Tajikistan: M. Kadamsharev, Pamir Institute of Biology, *in litt.*, 2003; Uzbekistan, n/a. For sources for last column, see text.

Snow Leopards in 1989-90, which represented 2.6 % of all animal stock held by 102 households. This was estimated to be equivalent to USD3866, roughly equal to the cash value of about 10 goats for each family, or around 20% of the average annual income for a herder family (USD252) (see **Table 3**) (Oli *et al.*, 1994). Over half the households interviewed in Hemis National Park (in Jammu and Kashmir, northern India) estimated losing 1-15 % or more of their domestic stock to predators, or 492 animals valued at USD23 500, over a 14-month period (Jackson and Wangchuk, 2001). Snow Leopards were associated with 55% of the incidents (and wolves with 31%). Sheep and goats constituted 75% of the stock lost, yaks/cattle (13%) and horses (8%) and three settlements incurred 54% of the losses (Jackson and Wangchuk, 2001).

The cost of livestock losses is especially high where so-called “surplus killings” occur, when Snow Leopards rampage through a corral, killing more than they need to eat. Jackson (1991) reports an event related by Tibetan herdsman, where a Snow Leopard had killed 107 sheep in just one night, in October 1998.

Factors affecting depredation

Although stock losses are often greatest in areas where the natural prey base of Snow Leopards has been reduced, there are other factors affecting patterns of depredation by the animals and hence their perception as a nuisance by herders.

Poor security is a factor in livestock depredation (Jackson, 1999). For example, in most cases of “surplus killings”, Snow Leopards were reported to have broken into night-time enclosures that were not properly constructed. Nearly 50% of all livestock reported lost in Hemis National Park, was taken by Snow Leopards entering poorly constructed corrals (Jackson and Wangchuk, 2001). Interviews in the Tibet Autonomous Region of China have shown that livestock losses to predators are higher when children act as guards, when a herd is too large for the number of guards and when no night-time enclosures are used (Jackson, 1991). A study in Mongolia found that Snow Leopards were more likely to kill large livestock, such as horses, yaks or camels, than smaller domestic animals, because these larger animals are often allowed to roam freely and generally are less well-tended than smaller stock (Sumiya and Buyantsog, 2002). Interviews



Credit: Rodney Jackson, Snow Leopard Conservancy

Herder with a dead goat. Retributive killing of Snow Leopards often results if livestock depredation is deemed unacceptable by herders

conducted by McCarthy (1999) among 105 herders in four provinces in Mongolia (Gobi-Altay, Hovd, Uvs and Bayan-Ölgiy) concluded that, on average, 57 head of livestock a year were lost to Snow Leopards and 70% of the losses comprised large animals, such as horses or yaks.

Seasonal factors can affect strikes on livestock by Snow Leopards. Sumiya and Buyantsog (2002), found that livestock losses in Uvs province, Mongolia, were more likely in winter, when grazing areas for domestic stock overlap more with habitat for Snow Leopards and their wild prey. During their survey, 76% of all livestock depredation cases happened in winter (December to February). Oli (1991) reported that Snow Leopard predation in the Annapurna Conservation Area of Nepal was higher in winter and that this was probably partly owing to the unavailability of marmots during their winter hibernation. Moreover, in winter and early spring Snow Leopards come down to lower elevations, so are closer to settlements and at a time when livestock is in poor condition owing to lack of forage and exposure to the elements (R. Jackson, *in litt.*, 12 July 2003).

Non-selective killing: traps and poison

Snow Leopards are killed accidentally in traps that target other animals or through poisoned bait. For example, in Krasnoyarsk Krai in the Russian Federation, it is estimated that up to six Snow Leopards die in musk deer traps each year and scientists of the Sayan-Syushinski Nature Reserve in the Altai Republic of the Russian Federation estimate that up to three Snow Leopards a year are accidentally caught in traps set out for musk deer and lynx (Poyarkov, 2002). In the Russian Federation and Kyrgyzstan, the wide and unregulated use of poison to control predators, for example, wolves, also threatens Snow Leopards (Poyarkov, 2002).

Habitat loss and fragmentation

Habitat loss, fragmentation and degradation affect Snow Leopards, but owing to the remoteness and inaccessibility of the preferred habitat, such impacts on Snow Leopards have been relatively limited until recently. Habitat alterations occur as a result of human encroachment into the species's range, for example for living space, resource extraction, road building, or new grazing grounds. Human conflicts may also contribute to habitat degradation or loss. Air strikes targeted guerrilla encampments in Snow Leopard habitat in Afghanistan during the recent conflict (Zahler and Graham, 2001) and hostilities continue in northern India and Pakistan, within the Snow Leopard's range area.

Trapping and killing for trade

Even where the primary motive for killing a Snow Leopard has not been trade, its body parts may still be sold. It is therefore important to understand the circumstances leading to killings where commercial gain is not the prime motive, as have been described in preceding sections, as sometimes being significant contextual and contributory factors linked to trade in Snow Leopards and their body parts.

Outline of the history of, and reasons for, trade in Snow Leopards

Sparse data on Snow Leopard trade are available for years prior to 1975, (when trade in the species was first recorded according to CITES requirements). Trade in Snow Leopard skins

from Russia in the 1920s has been estimated to have amounted to about 1000 pelts a year (Heptner and Sludskii, 1972; Fox, 1989). Certainly, hunting levels have been high in places during the twentieth century. Bannikov (1954) estimated that up to 80 Snow Leopards a year were hunted in the first decade of the twentieth century in Mongolia, though this number had dropped to 15-50 animals in the middle of the century (Hibbert, 1967). In the Kirghiz Soviet Socialist Republic (now Kyrgyzstan) almost 40 Snow Leopards a year were trapped between 1953 and 1963 and about 30 a year from the 1960s to the 1980s, after which the number soared during the 1990s (see **Kyrgyzstan** in following chapter).

Pelts from Snow Leopards were in demand during much of the twentieth century, for decorative reasons, for garments and as a sign of wealth and status in general. Snow Leopard skins have been presented as 'State gifts' among world leaders (Chestin, 1998; Dexel, 2002). The fur has also been used in traditional religious dresses in the Tibet Autonomous Region. The skins appear to be the primary reason for killing Snow Leopards for trade in the present day. The recent TRAFFIC report *Far From A Cure: the Tiger Trade Revisited* noted a rise in the trade of Asian big cat skins, including those of Snow Leopards, although this phenomenon is not adequately understood (Nowell, 2000).

Leopard bones, including Snow Leopard bones, have been used in traditional Asian medicines for centuries for a variety of treatments, including rheumatism, tendonitis and bone fractures (Bensky and Gamble, 1993). They are considered to have acrid and warm properties and to have anti-inflammatory and pain-relieving effects (Anon., 1994). In the Chinese *materia medica* they are referred to as *Bao Gu* or *Os leopardi* and their properties are distinguished from those of Tiger bones, although they can be used as a substitute for the latter (Bensky and Gamble, 1993). The skulls of Snow Leopards have also been used in ritual ceremonies in parts of China and in Nepal (G. Gurung, WWF Nepal, *in litt.*, 2002) and body parts other than bones, including the sexual organs, teeth, claws and meat appear in trade, for medicine and shamanistic practices (Khan, 2002a). In recent years, anecdotal reports from a number of range States have indicated an increase in the demand for Snow Leopard bones (McCarthy and Chapron, 2003). This increase is likely to be related to the stricter enactment and enforcement of wildlife trade controls for Tigers in a number of range and consumer States in the mid-1990s, which may have shifted trade to other big cat species (Nowell, 2000).

Hundreds of live Snow Leopards were traded during the twentieth century. The majority of these animals, exported to supply zoos, originated from what is now Kyrgyzstan and Tajikistan. Reports suggest that an average of 12 live Snow Leopards a year were exported by the former until the early 1970s, and up to 425 live specimens by the latter, between 1937 and 1969 (Heptner and Sludskii, 1972).

Occasional advertisements testify to present-day, international, illegal trade in Snow Leopards (in addition to the seizures reported in **Box 1**). A Snow Leopard skin rug was offered for sale in the *Jakarta Post*, an Indonesian daily newspaper in English, in September 2001 (C. Shepherd, TRAFFIC Southeast Asia, *in litt.*, 2002) and the German Society for Nature Conservation (NABU) reported a Snow Leopard skin coat (priced at USD100) and stuffed Snow Leopard advertised on *e-bay*, an internet-based trading site, in November 2002 and March 2003, respectively. The range State accounts following provide ample evidence of the illegal hunting and trade at the source of such international trafficking in Snow Leopard products.

THREATS TO SNOW LEOPARDS, WITH A SPECIAL FOCUS ON TRADE: RANGE STATE ACCOUNTS

This chapter presents country-specific accounts of the present-day threat to Snow Leopards from trade. Other threats in each range State are outlined briefly, or described at greater length where there may be a close link with trade in Snow Leopard parts (for example, where killing by herders may lead to body parts entering trade).

Afghanistan

While there is reported to be a longstanding conflict between herders and Snow Leopards in Afghanistan (Anon., 2003a), the recent years of conflict have exacerbated this and other threats to Snow Leopards in the country. Diversion of government attention from environmental protection and management, an influx of potential ready-customers for Snow Leopard products in the form of outsiders and increased hunting pressure on wild animals for meat, for example, are all cited as consequences of unrest and war since the end of Soviet governance of Afghanistan (Anon., 2003a).

Results of interviews undertaken in 2002, in the Wakhan Corridor, in Badakhshan province, north-east Afghanistan, suggest that most Snow Leopards are killed in retaliation for livestock predation (Anon., 2003a). Important differences between Snow Leopards and wolves in patterns of livestock predation were reported. While wolves took livestock throughout the year and made their kills in relatively expansive grazing areas, most Snow Leopard kills were reported in winter and were made by the animal entering a corral. These attacks consequently resulted frequently in “surplus killing” of livestock (see *Conflict with herders*). Snow Leopards are seen as particularly injurious to herders in this way and there have been numerous cases of Snow Leopards being shot in the Wakhan region (Anon., 2003a).

According to UNEP’s Post-Conflict Assessment in Afghanistan, the inhabitants of the Wakhan Corridor have responded positively to a call to hand in arms and to stop hunting, issued by the country’s Transitional Authority (Anon., 2003a). No wildlife parts were observed by UNEP personnel at the Ishkeshem and Faizabad markets during their field missions in Wakhan (Anon., 2003a). Although most Snow Leopards in this area are reportedly killed after attacks on livestock, the skins of such animals are said to be sold to passing traders.

The situation is said to be different in more westerly parts of Badakhshan province, where active hunting of Snow Leopards takes place. UNEP staff observed that Snow Leopard pelts from Badakhshan were being offered for sale in fur markets in Kabul, primarily to foreign aid workers and military personnel (Anon., 2003a). Kabul has allegedly turned into a lucrative market for Snow Leopard skins, since foreign aid workers and military personnel arrived in the city following the collapse of the Taliban regime. Consequently hunting of Snow Leopards for pelts has increased sharply (J. Khan, *in litt.*, 2002). Snow Leopard skins are reported to be sold in Kabul and in Faizabad for around USD1000 (Harrison, 2003). The skins are reported to originate from Afghanistan and Pakistan (J. Khan, *in litt.*, 2002). Pakistani traders reported that Snow Leopard skins fetched considerably higher prices in Kabul than in Pakistan and were popular among foreign visitors to Afghanistan (Khan, 2002a). In January 2002, a journalist reported the presence of a Snow Leopard skull in a shop in Jalalabad (about 100km east of

Kabul) (Chivers, 2002) and, in July 2002, an anonymous source informed TRAFFIC of a Snow Leopard skin on sale at a furrier's shop in Kabul.

Bhutan

The main threats to Snow Leopards in Bhutan are considered to be retaliatory killings of Snow Leopards in response to livestock losses, and grazing competition between domestic livestock and Snow Leopard prey (mostly Blue Sheep). The loss of livestock represents a significant blow economically to local herders, as one adult yak is valued at around BTN12000 (USD252), the equivalent of 1.7 times the annual income of a wildlife ranger (D. Yonten, Nature Conservation Division, Department of Forestry of Bhutan, *in litt.*, May 2003) (see **Table 3**).

China

The poaching of Snow Leopard prey species and habitat destruction, caused by over-grazing and human encroachment, are considered primary threats to Snow Leopards in western China (Ma *et al.*, 2002). Conflicts between herders and Snow Leopards are reported to have occurred occasionally in China, sometimes resulting in the poisoning of the animal (R. Jackson, *in litt.*, 12 July 2003). This type of conflict is widespread along the Tibetan border with Nepal, India and Bhutan, in the southern Xinjiang Autonomous Region, in Taxkoprgan Nature Reserve (along the Pakistani border), and in the Tien Shan mountains (R. Jackson, *in litt.*, 12 July 2003). Trading of Snow Leopard parts obtained following the killing of an animal for livestock predation is not infrequent in the Tibet Autonomous Region (R. Jackson, *in litt.*, 12 July 2003) and is said to be increasing in Xinjiang Autonomous Region (Wen, 2002).

Trapping and killing for trade

The poaching of Snow Leopards is considered to be one of the foremost threats to the cats in western China (Ma *et al.*, 2002). According to official statistics, 60 of the animals were killed in Qinghai Province, in western China, between 1988 and 1995 and it is estimated that over 100 have been poached in the province since 1990. It is assumed that the majority were killed by poachers that normally target Tibetan Antelopes *Pantholops hodgsonii*, but shoot Snow Leopards when an opportunity arises (Wen, 2002). In the neighbouring Xinjiang Autonomous Region, it is estimated that between 20 and 30 Snow Leopards are poached each year (Dai, 2002).

No comprehensive market surveys to assess the level of trade in Snow Leopard products have been undertaken in China but, as mentioned above, the trading of Snow Leopard parts following killings by herders may be on the rise in parts of China and this is reported to be in response to market demand, at least in Xinjiang Autonomous Region (Wen, 2002). One of the explanations for this may be an increased rate of detection, as a result of extra enforcement effort. The enforcement operation leading to the seizure of skins in Sichuan, in November 2001 (see over), involved more than 80 personnel from the Sichuan Forestry Department, the Sichuan Police Department and the Provincial Commerce Department, testimony to determined enforcement in that instance (J. Gong, Wildlife Conservation Division, Sichuan Forestry Department, *in litt.* to TRAFFIC East Asia, 2002). In any case, recent cases of Snow Leopard killings and trafficking in the animal's body parts suggest that China is both source and market for the trade (see examples listed over).

- In 1996, a Snow Leopard skin was reported openly on sale at CNY6000 (USD725), in a fur shop in the centre of Beijing. The shop assistant in attendance claimed to be unaware of the fact that Snow Leopards were protected and that it was hence illegal to offer their skins for sale (Wen, 2002).
- During surveys undertaken in 1998 by a Chinese investigator, 20 Snow Leopard skins were seen for sale in Songpan and five skins in Jiuzhaigou, counties in Sichuan Province (Wen, 2002).
- In 1999, three persons were sentenced in Linjiang County, in the eastern province of Fujian, to between five and eight years' imprisonment after they were found offering 17 Snow Leopard skins for sale. The case was reported in the *Fuzhou Evening News* (Wen, 2002).
- In January 2000, a person was caught trying to smuggle two Snow Leopard bodies through Xining railway station. The person confessed that the two bodies were bought at a local market and that he had intended to smuggle them to the town of Deyang, in Sichuan Province (Anon., 2000a).
- In February 2001, a Snow Leopard skeleton weighing 6.5 kg was bought by Chinese farmers on the black market in north-western China.
- In October 2001, a man was arrested in Tahelahe, in Xinjiang Autonomous Region, for trapping and killing a Snow Leopard in the Tuomur Mountain Nature Reserve, and was sentenced to 10 years' imprisonment (Wen, 2002).
- In November 2001, six Snow Leopard skins were seized in Sichuan, after Snow Leopard pelts were reportedly seen for sale for around CNY2800 (approx. USD280) in Songpan (Sichuan), in September 2001.
- In November 2001, two Snow Leopard skins were reported to have been for sale at Xining railway station building, in Qinghai Province (north-west China) (Xiao, 2001).
- In March 2002, a man was arrested for killing two Snow Leopards in Xinjiang Autonomous Region (Anon., 2002g).



Credit: Rodney Jackson, Snow Leopard Conservancy

Snow Leopard bones and pelt, bought by a hydro-engineer in the Tibet Autonomous Region of China, near Mount Everest.

- The pelt and bones of Snow Leopards exchanged for sheep across the border with Nepal are reported to have been sold on to Chinese government workers for cash (R. Jackson, *in litt.*, 12 July 2003).

Prices for skins cited above compare with prices of CNY4000, for large Snow Leopard skins, and CNY2500 for smaller ones, seen on sale in Kashi (Kashgar), in Xinjiang Autonomous Region, in 1996 (G. De Ferrari, TRAFFIC USA, *in litt.* to R. Parry-Jones, TRAFFIC East Asia, November 1996).

There is some information on prices fetched for Snow Leopard bones in China. The Snow Leopard skeleton bought by farmers in February 2001 (see previous page) was sold for around CNY2500 (approximately USD300) and subsequently sold, in Shanghai, to a businessman from Singapore, for CNY90 000 (approximately USD10 880) (R. Parry-Jones, TRAFFIC East Asia, *in litt.*, 2002). This indicates a market price of USD1670/kg for Snow Leopard bones in China, but based on information received from an anonymous source, the price for Snow Leopard bones on the black market in China is lower than this, at approximately CNY600 (USD72.6)/kg.

The main source areas for Snow Leopards within China are reported to be Xinjiang Autonomous Region, Qinghai, Gansu and the Tibet Autonomous Region, in approximate order of importance (R. Jackson, *in litt.*, 12 July 2003). Songpan and Jiuzhaigou, in Sichuan Province, are both popular tourist destinations and appear to be important markets for the trade in Snow Leopard skins in China (see examples on previous page). The city of Kashi, which is close to the Kyrgyz border, is also reported to be an important market for Snow Leopard skins. Anecdotal reports of dozens of Snow Leopard skins available for sale at the market in the mid-1990s were received from visitors to Kashi (Anon., 1996b; H. Xu, *in litt.* to TRAFFIC East Asia, 2003). In 1996, the presence of “several” Snow Leopard skins and products made from the same was reported at Kashi’s market and in several tourist shops, including the government-run handicraft centre (G. De Ferrari, TRAFFIC USA, *in litt.* to R. Parry-Jones, TRAFFIC East Asia, November 1996). Kashi is also a well-known destination for Snow Leopard skins among the traders in Kyrgyzstan (Wen, 2002; Anon, 2001b). According to a report by China’s Xinhua News Agency, two people arrested attempting to sell skins and bones of two Snow Leopards on Kashi market, in March 2002, stated that the animals had recently been trapped in the county of Tekesi, near Yinning city, in Xinjiang Autonomous Region (Anon., 2002g).

Seizure information from China indicates a demand for Snow Leopard bones and skin, but the meat is also said to be used in Chinese medicine, for sexual potency, and in traditional Tibetan medicine, to cure kidney problems (Wen, 2002). The *Chengdu Business News* reported that dishes made of Snow Leopard meat have been offered in restaurants in Sichuan (Anon., 2000b). Some Snow Leopards are reported to be taken alive, to supply Chinese zoos and private collections (Wen, 2002).

India

Retaliatory killings of Snow Leopards by herders are considered to be the largest threat facing the species in India (Mishra, 1997; Spearing, 2002; M. Misra, TRAFFIC consultant, *in litt.*, 2002). There also seems to be increased evidence of such killings as heavy livestock losses are incurred in remote mountain hamlets (Rinchen Wangchuk, 2002, pers. comm. to M. Misra,

2002). Occasional killing of sheep and goats by Snow Leopards is usually tolerated, especially if some of the carcasses can be retrieved, but if large numbers of livestock are attacked, the Snow Leopards are often killed (Fox *et al.*, 1988). Such incidents are reported, for example, from Zaskar, in northern India, where 75 animals were lost to Snow Leopards entering the same corral on three separate occasions (Spearing, 2002). Spearing's study surveyed 121 households in eight villages and concluded that at least 16 Snow Leopards were killed by aggrieved villagers in the study area between 1996 and 2002. Most of these animals were killed on site, either after they had taken livestock, or entered a village (Spearing, 2002). Reports of at least one Snow Leopard a year killed after livestock predation in Ladakh, during the period 1978-88 (Osborne *et al.*, 1983; Fox, 1989) testify to a similar situation in that region at that time.

Although retaliatory killings of Snow Leopards by herders are considered to be the largest threat to Snow Leopards in India, the country has a recent history of trade in Snow Leopard products. In the early 1980s, Snow Leopard skins were available, valued at about USD250 to 500 in the

Table 4

Seizures in India involving Snow Leopards and their parts, 1994-2002

Date	Location	Specimen	Quantity	Remarks
July 2002	Manali, Himachal Pradesh	Snow Leopard skin	1	Offered for sale in Manali in July 2001
March 2001	Munsiari, Pithoragarh District Uttarakhand	Snow Leopard skin	1	Seized together with five Leopard skins and two kg of cannabis; two persons arrested
May 2000	Manali Himachal Pradesh	Snow Leopard skin	1	Seized together with three Leopard skins, five red fox skins and six kg of cannabis; one person arrested
January 2000	Puh, Uttarakhand	Snow Leopard skin	4	Seized together with one Tiger skin; two persons arrested
July 1997	Darjeeling	Adult live Snow Leopard	1	Sent to Darjeeling Zoo
May 1997	Auli, Uttarakhand	Snow Leopard	1	Accidentally killed
November 1994	Srinagar, Jammu and Kashmir	Snow Leopard skin	18	Seized
December 1994	Ladakh	Adult live Snow Leopard	1	Caught by army officials and sent to Chatbir Zoo

Source: Compiled by TRAFFIC India

north-west Himalayan tourist towns of Srinagar and Manali (Osborne *et al.*, 1983). No Snow Leopard bones have yet been positively identified in trade in India (M. Misra, TRAFFIC consultant, *in litt.*, 2002). No comprehensive market surveys for Snow Leopard products have been undertaken recently in India, but TRAFFIC India compiled information on incidences of poaching and trade involving Snow Leopards over several years (see **Table 4**). Further indication of trade in Snow Leopard products is available as a result of an inventory of fur items with furriers in Jammu and Kashmir, conducted by State authorities, in 1997. This inventory was initiated with the aim of compensating furriers before all furs of protected species were confiscated and the fur trade closed (M. Misra, TRAFFIC consultant, *in litt.*, 2002). **Table 5** shows the number of Snow Leopard skin items reported to the authorities. Although this is not the total number of Snow Leopard products stocked by furriers (as not all reported their stocks), a considerable number of Snow Leopard skins and garments were held. Following the inventory, the compensation scheme ran into difficulties and, instead of being destroyed, the skins and garments remained with the furriers (M. Misra, TRAFFIC consultant, *in litt.*, 2002).

Table 5

Findings of an inventory of furriers in Jammu and Kashmir in 1997.

Fur item	Quantity	Price per item (INR)
Snow Leopard skin	98	10 000 (USD200)
Snow Leopard coat (long)	11	50 000 (USD1030)
Snow Leopard coat (short)	5	30 000 (USD620)
Mounted Snow Leopard skin	6	11 000 (USD230)
Snow Leopard head	1	100 (USD20)
Snow Leopard hats and gloves	8	200 (USD4)

Source: Anon., 1997.

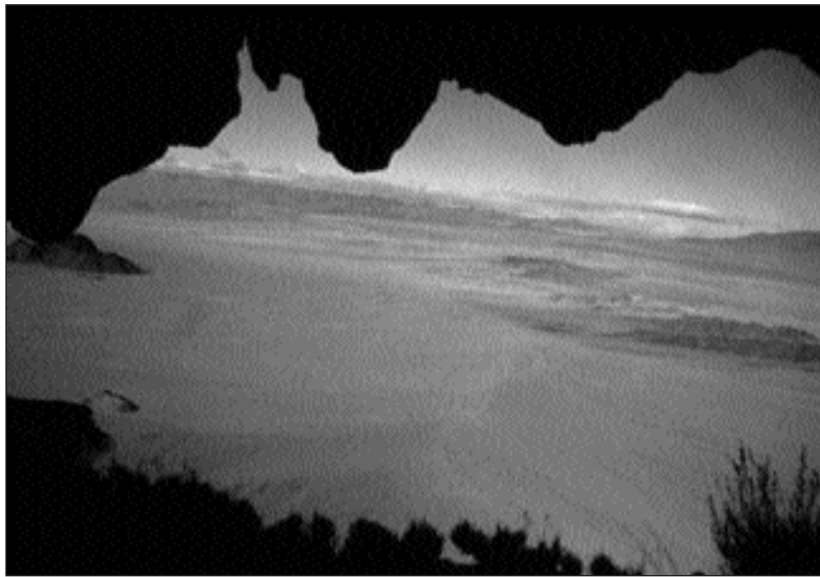
Mongolia

Conflict with herders

Snow Leopard predation of livestock is causing significant problems in most areas of the species's range in Mongolia. Consequently, killings of Snow Leopards by herders, to prevent such attacks, are considered one of the greatest threats posed to the species in Mongolia (Munkhtsog, 2002). It is assumed that most Snow Leopard skins offered for sale in markets local to herders, or in Ulaanbaatar, are from Snow Leopards killed by herders wanting to protect their stock. Snow Leopard killings of livestock can constitute a significant economic loss to local herders, who often are entirely dependent on their herds for subsistence and additional cash income, for example from the sale of wool. In recent years many herder families have suffered dramatic losses in livestock (up to 80% in some areas) after exceptionally harsh winters in 2002 and 2003 (B. Munkhtsog, *in litt.*, 2003; Anon., 2000c). At the same time, the market value for cashmere wool dropped from an average of USD40/kg, in 2001, to USD10 to 15/kg, in 2003 (Munkhtsog, 2002), exacerbating the effect of any predation on domestic stock by Snow Leopards. Authorities in Mongolia recorded the case, in 2000, of a Snow Leopard killed by a herder in retribution for the taking of five sheep and two young cows, in the Bayanzurkh

mountains, inUvs province (Munkhtsog, 2002). The herder was fined USD10, had his gun confiscated and had to pay USD160 in compensation for the Snow Leopard. In February 2003, two Snow Leopard cubs were recorded killed in Govi-Altay province. The two cubs were together with their mother, who had attacked livestock near a herder's winter camp and killed several goats (Munkhtsog, 2002). In such cases, where Snow Leopards are killed primarily to reduce attacks on domestic livestock, most herders are nonetheless aware of the high prices fetched by the animal's body parts. The skins are often hung up in herders' houses, and sold if the opportunity arises. Sometimes the skeleton is also kept and sold to passing traders or at local markets (Munkhtsog, 2002).

Credit: Tom McCarthy, International Snow Leopard Trust



Snow Leopard's cave, in the Mongolian Gobi Desert

Trapping and killing for trade

The results of the trade survey conducted in Mongolia, in June and July 2002, provide only a preliminary picture of the extent and scale of the trade in Snow Leopards in the country and more research will be needed to complement these findings.

Political and economic changes that occurred in the early 1990s in Mongolia, largely in response to the break-up of the Soviet Union, and increased trade liberalization within China and other east Asian countries, affected the use and trade of wildlife in Mongolia. State-controlled collective farms and co-operatives in Mongolia ceased to function, leaving unemployment in their wake. This situation, coupled with emerging market opportunities, led to increased exploitation of wildlife resources and subsequent trade in commodities in demand by Chinese traders (Tsendjav and Batbold, 2002). Although no baseline data from before 1992 exist, concerns have been raised that illegal trade in Snow Leopard skins has increased in the last 10 years (Munkhtsog, 2002). It is also feared that the existing demand for Snow Leopard bones in China may increase poaching of Snow Leopards in Mongolia (Munkhtsog, 2002). Although Snow Leopard bones have not been observed at wildlife markets in Mongolia, traders as well as hunters seem to be increasingly aware of the potential for profit as a result of this

demand from Chinese traders. Traders and middlemen from Ulaanbaatar or Dalanzadgad in Ömnögovı province sometimes visit villages and herder communities in the search for Snow Leopard skins that are being kept in the homes of herder families. The owner of a Snow Leopard skeleton reported in April 2003 that he kept this at his house with the intention of selling it to Chinese traders (B. Munkhtsog, *in litt.*, 2003). In some instances, traders have also placed specific orders for Snow Leopard skins with local hunters, who would then seek to kill a Snow Leopard upon request (Munkhtsog, 2002). Occasionally, Snow Leopard skins are reported to be advertised in local newspapers and, in March 2001, a person made a request via a local radio station, expressing his interest in buying a Snow Leopard skin (Munkhtsog, 2002).

Based on data from the General Customs Department of Mongolia and other data collected by International Snow Leopard Trust-Mongolia, significant numbers of Snow Leopard skins have been confiscated in the 1990s (**Table 6**). However, it should be noted that the information presented in **Table 6** is likely to be incomplete, a result of inconsistent record keeping or irregular reporting, and it can be assumed that more Snow Leopard skins have been seized in last ten years than **Table 6** shows. Fifty-seven of the Snow Leopard skins seized between 1993 and 1995 were intercepted at the Buyant-Ukhaa International Airport in Ulaanbaatar, at the Zamiin Uud check point at the Mongolian-Chinese border, and at Altanbulag, a checkpoint at the Russian-Mongolian border. No information is available about how many were seized at each location. There are also records of illegal killings of Snow Leopards apart from those already mentioned (following conflict with herders). In 1998, a man illegally killed a Snow Leopard in Uvs province. He had his gun confiscated, was fined USD15 and had to pay USD160 in compensation for the killed animal. In 2002, two men were fined for killing a Snow Leopard in Uvs province and had to pay USD880 in compensation for the killed animal (Munkhtsog, 2002). It is not known if trade was the intended purpose of hunting in these cases.

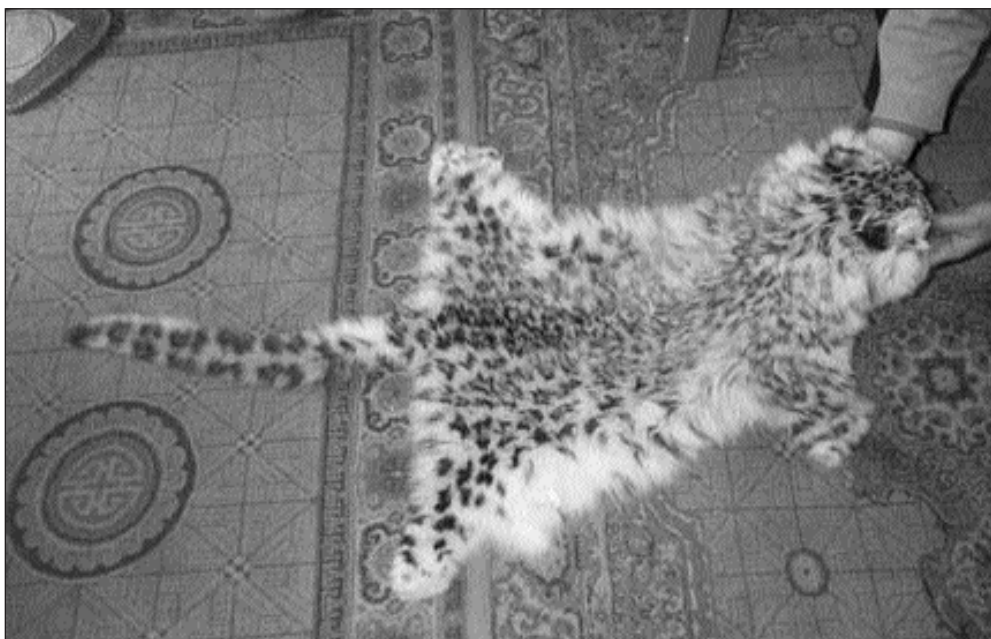
Table 6

Number of Snow Leopard skins confiscated in Mongolia, 1993-2001, excluding 1996, 1997 and 1999, for which no information was available.

Year	No. of confiscated Snow Leopard skins
Until 1992	49
1993	15
1994	19
1995	25
1998	1
2000	3
2001	1
2002	3
Total	116

Source: General Customs Department of Mongolia, 2002

Although records of seizures and penalties for Snow Leopard killing and trade testify to enforcement action by Mongolian authorities, there are reports of Snow Leopard skins, once confiscated, being given to commercial businesses, for display. Confiscated skins were given, for example, to the Chingisiin Urgoo Tourist Camp, situated near Ulaanbaatar, which had more than 60 skins on display. Khand Chin Vangiin Urgoo Restaurant, in Ulaanbaatar, was reported to have more than 10 Snow Leopard skins, allegedly obtained from the government (Munkhtsog, 2002). While this was not necessarily illegal, it demonstrates a certain lack of awareness that this may be a means of stimulating demand for the skins and hence illegal killing of Snow Leopards. Until 2001, hats made of Snow Leopard skin were even openly offered for



Credit: B. Munkhtsog and L. Purevjav

Snow Leopard skin carpet at a tourist camp, in Mongolia. It is reported that confiscated Snow Leopard skins were given to the tourist camp for use as decoration, in the absence of any other known use. Objections were raised by tourists who knew the species to be endangered.

sale at a government department store in Ulaanbaatar. However, following strong lobbying from local NGOs and increased media coverage, the Ministry of Environment investigated the case and seized the Snow Leopard products in 2001, since which time Snow Leopard skin items have not been seen for sale in this store (Munkhtsog, 2002).

Based on the data shown in **Table 7**, more than 10 Snow Leopard skins were sold annually at Altay market in the early 1990s, but by 2000 around four to five skins per year were reported sold. This indicates that the trade in Snow Leopard skins has decreased since the mid-1990s in Altay. This could be owing to increased awareness of the illegality of this trade among traders and customers. Most traders interviewed during the surveys conducted in the summer of 2002 were well aware that the Snow Leopard is a protected species in Mongolia and that trade in its skin is illegal. The traders further explained that they found it increasingly difficult to attract customers and that the value of Snow Leopard skins had fallen since the mid-1990s. Nowadays, most trade was said to be confined to high-ranking officials, for whom it is easier to avoid legal controls, or professional traders who are also involved in the trade of other wildlife products (Munkhtsog, 2002).

Prices for Snow Leopard skins in Mongolia, 1990-2002, are shown in **Table 7**. These ranged from USD55-200 in rural areas, but were considerably higher in Ulaanbaatar, where skins were offered for USD180-800. A skin exported in November 1999 from Ömnögovi province, to China, sold for USD360 (Munkhtsog, 2002) and, in April 2003, the owner of a Snow Leopard skin and skull stated he expected these to fetch USD880 in Ulaanbaatar. The man claimed he had bought the Snow Leopard products for around USD175 in his home province of Hovd (B. Munkhtsog, *in litt.*, 2003). Skins traded across the border to the Russian Federation were reported to be sold at USD50 (four to five times less than the price of the cheapest Snow Leopard skins from the Russian Federation) (Koshkarev, 2002).

Table 7

Snow Leopard products noted at wildlife markets and other places in Mongolia since the early 1990s

Date	Location	Specimen	Quantity	Price (USD)	Remarks
Local market in Altay (Govī-Altay province)					
July 2002		Skin	1	70	
2001		Skin	2	72	
2000		Skin	4-5 skins sold/year	55-72	Information received from traders
1990-1995		Skin	> 10 sold per year		Information received from traders
Local market in Hovd province					
Jan 2002		Skin with skull	2		Offered for sale to researchers
Jan 2002		Frozen body	2		Offered for sale to researchers
April 2002		Skin	6	180	Offered for sale to researchers
Sept 2001		Skin	1		Sold
Ölgiy town market					
Sept 2001		Skin	4		Sold
Market in Ömnögovi province					
2001	Dalanzadgad	Skin	2	180	
1997	Dalanzadgad	Snow Leopard skin	3		
Various locations in Ulaanbaatar					
May 2002	Tsaiz market in Ulaanbaatar	Skin	1		
April 2002	Middleman in Ulaanbaatar	Skin	1		For sale
March 2002	Middleman in Ulaanbaatar	Skin	1		For sale
April 2001	Tourist shop in Ulaanbaatar	Skin	2	800	For sale
April 2001	Tourist shop in Ulaanbaatar	Skin	1	600	For sale
Nov 2000	Shop in Ulaanbaatar	Stuffed cub	1	-	For display
March 2000	Offered by hunter in Ulaanbaatar	Skin with skull	1	120	
2000	Department store in Ulaanbaatar	Hat made of skins	2	40-50	
1999	Ulaanbaatar	Skin with skull	1		For sale
1999	Ulaanbaatar	Skin with skull	2		For sale
1996	Ulaanbaatar	Skin	1	180	Origin of skin: Altay

Sources: The data presented in the table are derived from a range of sources, such as reports from NGOs, scientists and conservationists, and findings of market surveys undertaken by the International Snow Leopard Trust-Mongolia since the early 1990s.

According to the trader found selling a Snow Leopard skin in Altay, during surveys undertaken in June and July 2002 (see **Table 7**), prices for Snow Leopard skins had fallen in recent years and it had become increasingly difficult to sell Snow Leopard skins. He explained that he had offered the Snow Leopard skin for USD70 to an interested customer, who, however, was not prepared to pay more than USD50 and therefore no transaction was made.



Credit: B. Munkhtsog and L. Purevjav

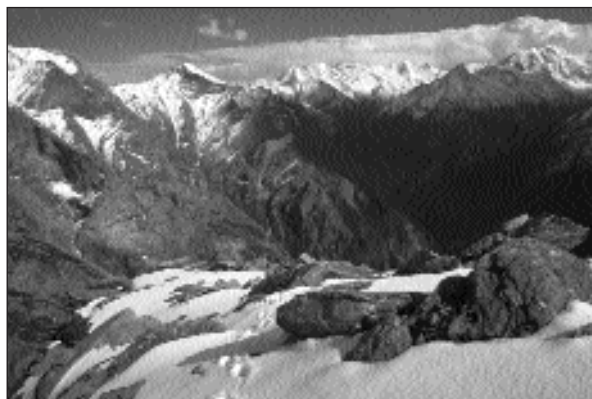
Park staff in Mongolia with a confiscated Snow Leopard skin

The majority of Snow Leopard skins in trade in Mongolia are said to be exported to China and to the Russian Federation, but anecdotal reports also suggest that skins go to western and eastern European countries (Munkhtsog, 2002). The Russian Federation is the preferred destination for skins traded by the Kazakh people who live in Bayan-Ölgiy province in western Mongolia. Since the early 1990s, up to 10 Snow Leopard skins a year have been traded from Mongolia to

the Russian Federation through the frontier crossing point at Tashanta, bordering the northern edge of Bayan-Ölgiy province (Koshkarev, 2002).

Nepal

As in other countries in the region, Snow Leopards in Nepal are faced with a considerable threat from livestock owners, seeking to kill the animals in order to reduce predation on their herds (McCarthy and Chapron, 2003). Several studies have looked into the conflicts between herders and Snow Leopards in Nepal (Bajimaya, 2000; Oli *et al.*, 1994; Kattel and Bajimaya, 1997; Ale and Karky, 2002). According to Oli *et al.*, (1994), more than 50% of herders interviewed in the Annapurna Conservation Area of Nepal felt that Snow Leopards posed a threat to their livestock and should be eradicated in order to prevent further losses. Only three per cent felt that compensation would be a satisfactory solution to the problem. Four herders interviewed by Oli admitted having killed Snow Leopards after livestock losses, but he considered this to be an under-estimate of the actual number of retaliatory killings (Oli *et al.*, 1994). Occasionally Snow Leopard cubs are removed from their natal dens (Bajimaya, 2000). It used to be traditional practice among villagers to reward anyone who killed a Snow Leopard with food, shelter and beer in areas as far apart as Mustang, Manang, and Dolpo. This practice has now largely waned, although anyone trapping a Snow Leopard after a spate of livestock losses is still considered to have done the community a service (R. Jackson, *in litt.*, 12 July 2003).



Credit: Rodney Jackson, Snow Leopard Conservancy

Snow Leopard tracks in typical habitat in the Himalayas

Trade in Snow Leopards skins has been reported to occur primarily in the northern region of Nepal, bordering the Tibet Autonomous Region of China, and India. As this region is relatively inaccessible owing to its remoteness, illegal wildlife trade across the national border is common and difficult to control. Some border villages, such as Chhangaru close to the Tibetan border, are occupied by enforcement officials for only some of the year. Illegal trade in wildlife products such as the wool or hides of Tibetan Antelopes and Tiger skins and bones has been known along the Nepalese border with China for several decades and trade routes between Nepal, China and India are well established (Shakya, 2002). Although enforcement efforts have increased in recent years, especially with the intent of combatting the illegal trade in shahtoosh, the cross-border illegal trade is still considerable (Shakya, 2002). The most important centres for wildlife trade in the northern region of Nepal are Taklakot, Kodari, Gola and Panchthar (Shakya, 2002). Normal trade routes to the Tibet Autonomous Region of China are:

- from Dolpa, via Mustang, in western Nepal,
- from Gorkha, via Manaslu, in the central region of Nepal, and
- from Taplejung, in the east of Nepal, via the border by Kanchenjunga, at the far north-eastern tip of Nepal.

All of these routes have open border passes through which skins can be taken out of Nepal into China (G. Gurung, WWF Nepal, *in litt.*, 2002).

Unlike Tiger and Leopard skins, Snow Leopard skins are usually not traded through middlemen but directly by the hunters in exchange for products such as salt, butter, or livestock (G. Gurung, WWF Nepal, *in litt.*, 2002; R. Jackson, *in litt.*, 12 July 2003). Herders in the Mugu District of western Nepal have been known to exchange the pelt and bones of Snow Leopards for sheep breeding stock with villagers across the Tibetan border (R. Jackson, *in litt.*, 12 July 2003). Bajimaya (2000) reports that herders living along Nepal's northern border have been engaged in this type of exchange for decades. Hunters in the same district are reported to earn around USD10-50 for a Snow Leopard skin, an amount comparable to the yearly income of a herder in the area (Jackson, 1979; Bajimaya, 2000). Trade in Snow Leopard bones from northern Nepal to the Tibet Autonomous Region of China is reported to be increasing and there are concerns that it may be replacing the fur trade as a primary incentive to trade in the species (Bajimaya, 2000).



Poisoned spears used to kill Snow Leopards in western Nepal

Credit: Rodney Jackson, National Geographic Society

Kathmandu is known as an important centre for trade in wild cat skins and other wildlife products (Van Gruisen and Sinclair, 1992). In 1989, an investigator reported the sighting of twelve Snow Leopard skins and a Snow Leopard fur coat offered for USD3000 in a five-star hotel in Kathmandu (Bajimaya, 2000).



Credit: Rodney Jackson, National Geographic Society

Villagers in Dolphu village, Mugu District, western Nepal selling a Snow Leopard pelt

Pakistan

The long-term future of the Snow Leopard in Pakistan is under threat, mainly from retaliatory killings by farmers and poaching for pelts and other body parts (Hussain, 2003). Loss of prey and of natural habitat are also affecting the species. Marmots, important prey species for Snow Leopards, were regularly observed during market surveys in Pakistan, in 2002, and conservationists have raised concerns about the unmanaged exploitation of marmots in Pakistan (Khan, 2002a). According to furriers in Karachi, marmot skins are in great demand in Europe and the Russian Federation and the majority collected in Pakistan are destined for export. One marmot skin is worth around USD10, depending on the quality. Trophy hunting of ungulates may be contributing to a diminution of Snow Leopard prey in northern Pakistan (Hussain, 2003).

A widespread lack of awareness of the Snow Leopard's conservation status and/or a lack of political willingness to act in the interests of this cause among local people and government officials are situations which, in themselves, present threats to the species in Pakistan.

Trapping and killing for trade

The results of the market survey undertaken in Pakistan, in July and August 2002, provides an indication of the present-day trade in Snow Leopards in the country, but further field investigations will be needed to understand the trade in Snow Leopards more thoroughly in Pakistan.

Pakistan has been well known for its trade in fur and animal skins; vendors selling animal skin and fur products are a regular sight in many Pakistani markets (Khan, 2002). The trade in animal skins has a long tradition in this region and skins of Leopards and Snow Leopards were sought-after items in the Silk Route trade (pre-fourteenth century). Peshawar, in north-west Pakistan, has long served as an important trading post for skins brought from the North West Frontier Province, the Northern Areas province and from central Asia and Afghanistan. The tradition of skin trade there has created well-established contacts between hunters, middlemen and traders.

Nowadays, those involved in the legal (and illegal) trade in animal skins in Pakistan are often vendors of carpets and antiques or traders of domesticated Karakul Goat *Ovis aries* skins. According to Khan (2002), poaching of Snow Leopards for their skins is relatively common in Pakistan and considered to be increasing. Although the trade is illegal, at least in most of the species's range in Pakistan (see **Legislation**), the financial returns for poachers are very alluring, considering that USD350-400 (the price of a Snow Leopard skin in Pakistan) is equivalent to the annual cash income of a family in northern Pakistan (Hussain, 2003). Moreover, poaching of Snow Leopards may often take place with the consent of a whole village, because the Snow Leopard's death means a reduced threat to local livelihoods (Hussain, 2003). Therefore, effective conservation programmes will only be successful when they aim at protecting local people's livelihoods and provide strong incentives for local communities not to kill Snow Leopards in retaliation for livestock predation nor to tolerate their killing for trade (Khan, 2002a).

During investigations in January 2002 (see **Methodology**), four Snow Leopard skins and one Snow Leopard head were observed in Peshawar and one trader claimed to be able to provide five additional skins without problem. The price per skin was around PKR20 000 (USD340) (Khan, 2002b). During the surveys undertaken in summer 2002, Snow Leopard skins were available upon request, and in some cases were openly offered. Most Snow Leopard skins were observed in furrier shops or in carpet and antique shops. In Peshawar, the surveys concentrated on the two main market areas, the Namak-Mandi market and the Kissa-Khawani market. These markets have a long tradition in trading in the skin and antiques trades and are nowadays regularly visited by tourists. Each market has around 50 shops dealing in skins. Based on interviews with traders in Peshawar, it was estimated that most such shops in the two markets visited stored at least one Leopard or Snow Leopard skin for sale. Traders in northern Pakistan reported that, although demand for a range of animal skins had increased since late 2001, skins of Snow Leopard, Leopard *Panthera pardus* and Brown Bear *Ursus arctos* fetched the best prices (Khan, 2002a). In several instances, Snow Leopard products were displayed openly for sale, even though the majority of traders seemed to be aware that trade in Snow Leopard skins was illegal. Six Snow Leopard skins were seen in a shop in the Kissa-Khawani market, together with a variety of other wildlife items, including Snow Leopard nails and teeth, said to be used in shamanism (see **Table 8**). A trader informed investigators that leopard meat, bones and male reproductive organs are used in local recipes to increase sexual potency.

Lahore is known as a centre for taxidermy. Stuffed animals, especially cats, are used in the film industry in Lahore, but are also valued as decorative items for display in private homes by wealthy people. A stuffed Snow Leopard head was offered for sale in a taxidermist shop in Lahore, that also offered Tigers and Leopards for sale (Khan, 2002a).

Table 8

Snow Leopard and other wildlife items observed during market surveys undertaken in 2002, in Pakistan

Species/specimen	Quantity	Price (USD)
January 2002		
Antique shop, Peshawar		
Snow Leopard skin	2	340/skin
Furrier shop, Peshawar, Namak-Mandi market		
Snow Leopard skin	2	350/skin
Leopard <i>Panthera pardus</i> skin	1	500/skin
Head of Markhor <i>Capra falconeri</i>	1	
Marmot skins	Several	5-10/skin
Taxidermist shop in Lahore		
Snow Leopard head	1	170
Stuffed Tiger cub	1	
Stuffed lion	3	
Stuffed Leopard		
July 2002		
Furrier shop, Peshawar, Namak-Mandi market		
Pieces of Leopard skin	Several	0.4/cm ²
Pieces of musk deer skin	Several	0.7/cm ²
Marmot skins	Several	10/skin
Coats made of fox <i>Vulpes vulpes</i> skins	1	670/coat
Coats made of Himalayan Civet <i>Paguma larvata</i>	1	1 170/coat
Peshawar, Kissa-Khawani market		
Snow Leopard skins	6	340-510/skin
Stuffed Leopard	1	
Leopard skin	1	500/skin
Musk deer <i>Moschus</i> spp. Skins	15	
Wolf <i>Canis lupus</i> skins	>200	
Asian Black Bear <i>Ursus thibetanus</i> skin	2	
Otter <i>Lutra lutra</i> skins	Several	130/skin
Leopard Cat <i>Prionailurus bengalensis</i> skins	>100	
Marmot skins	>90	
Snow Leopard nails	20	17/kg
Snow Leopard teeth	10	17/kg
Leopard nails	25	17/kg
Leopard teeth	10	17/kg
Leopard meat and bones (of one animal)		250
Brown Bear <i>Ursus arctos</i> fat		340/kg
Roots of <i>Saussurea costus</i>		1.7/kg
Taxidermist, Lahore		
Stuffed Leopard head	1	170
Karachi		
A wide variety and number of furs including wolf, Leopard Cat, fox, jackal, lynx and marmot		

Note: Blanks in this table indicate "no data available". Source: Khan, 2002a and b.



Four Snow Leopard pelts (two with broken tails) in a shop in Peshawar, Pakistan

No Snow Leopard skins or other body parts were observed in the markets and shops visited in Karachi and Rawalpindi in July 2002, but a number of traders claimed that they could provide these upon request. In general, traders at markets in Karachi and Rawalpindi seemed to be well aware that the trade in Snow Leopard was illegal and were careful because of this. According to traders in Karachi, the availability of Snow Leopard skins had decreased over the last decade.

Origin of the skins in trade and trade routes

According to interviews with skin traders, Snow Leopard skins are brought to Peshawar and other markets from locations across the species's range in Pakistan. In January 2002, the town of Skardu in the Northern Areas province was visited (Khan, 2002b). Skardu is reported to be an important trading place for various wildlife products and especially skins. From Skardu, Snow Leopard skins are often taken to Peshawar, where higher prices are paid. Based on an interview with a hunter from the North West Frontier Province, Snow Leopards as well as other fur-bearing animals are generally hunted using traps or poison, probably to ensure that the skins are kept intact and to avoid bullet holes. Most trappers and hunters have well-established contacts with local traders who sell the skins at local markets or to the bigger traders in cities such as Peshawar. Peshawar supplies skins to cities elsewhere in Pakistan. The common means of transportation for Snow Leopard skins in Pakistan is by truck, hidden among bundles of legal hides, such as sheep skins. Snow Leopard skins are also moved by public transport, sometimes after arrangement with the driver.

The most important consumers of Snow Leopard products in Pakistan are wealthy people, and skins or stuffed specimens are reported to be sold to high-ranking government officials. A trader in Peshawar reported selling two Snow Leopard skins to a senior politician in the North West Frontier Province. According to the Northern Areas Wildlife Department, no charges have been

made relating to the killing of Snow Leopards or illegal possession and trade of Snow Leopard body parts. However, some staff at the Wildlife Department indicated that they were aware of cases of illegal killings of Snow Leopards in the Northern Areas and knew of cases where the skins had been offered for sale, but where it had been impossible to take appropriate enforcement action, owing to the high social or political status of the purchasers (Khan, 2002a). Based on interviews with traders in Skardu, Snow Leopards are regularly stuffed to order for wealthy people and are often given as presents to governmental officials. One taxidermist claimed to have stuffed around 10 Snow Leopards in 2001 and around 24 Snow Leopards a year between 1998 and 2000. A decrease in stuffed Snow Leopards was reported to be a function of the increasing rarity of the species, in combination with the effect of increased enforcement efforts, rather than because of a decrease in demand.

Based on interviews with traders in Skardu and Peshawar, the Middle East, the Russian Federation, Europe, and recently Kabul, in Afghanistan, are reported to be important destinations for Snow Leopard skins from Pakistan. Pakistani traders have reported that skins sold at Kabul's street markets get much higher prices than in Peshawar (Khan, 2002a). The skins are often taken over the border by traders from Afghanistan and are reported to be hidden within shipments of other skins and goods. Dubai is considered a clearing-house for stuffed animals and there is demand for Snow Leopards. During the 1990s, and following the decreased demand for fur garments in western Europe and North America, the Russian Federation became a lucrative market for fur items produced in Pakistan (Khan, 2002a). In some instances, Snow Leopard skins are being used for such items, for example for hats or coat collars.

Central Asian republics and the Russian Federation

The prime motive for killing Snow Leopards in the Russian Federation and central Asia seems to be trade and financial gain (Koshkarev and Vyrypaev, 2000; Dexel, 2002; Poyarkov, 2002). This is largely a result of the political and social changes that occurred in those countries since the break-up of the Soviet Union, which had devastating effects on the territory's wildlife and natural resources (Koshkarev, 1997). The failure to pay salaries and wages in the early 1990s and the loss of governmental infrastructure to control the increasing number of black markets and the scale of corruption led to a sharp increase in poaching. Severe inflation, food shortages, a demand for hard currencies, and salaries of less than USD10 a month for wildlife guards, are seen as the main reasons for this. Many of the former State-controlled collective farms and co-operatives collapsed leaving people, especially in rural areas, without employment and income. Rural people, including wildlife wardens, turned towards natural resources in the hope of an income from the sale of the meat or other parts of animals (Koshkarev and Vyrypaev, 2000). In the Soviet Union, the *Zookombinat* was the governmental institution responsible for providing wild animals to zoos. Once this ceased functioning, after the change in political regime, many skilled trappers were left without official employment, but continued to hunt wild animals, including Snow Leopards. The high profits to be gained from trading Snow Leopards and the increasing poverty among the rural population also encouraged numerous people who were novice hunters to poach Snow Leopards. In addition, East Asian countries, especially China, which is considered to be an important destination for Snow Leopard skins and possibly other body parts, opened their borders to the Russian Federation and the new neighbouring republics. This provided new market opportunities for a range of animal products that had not before been

targeted in the region and trade with China from the territory of the former Soviet Union has increased (Chestin, 1998; Dexel, 2002). Snow Leopard skins traded from the region have been reported to pass, via Kyrgyzstan, to the town of Kashi, in Xinjiang Autonomous Region (see **China**).

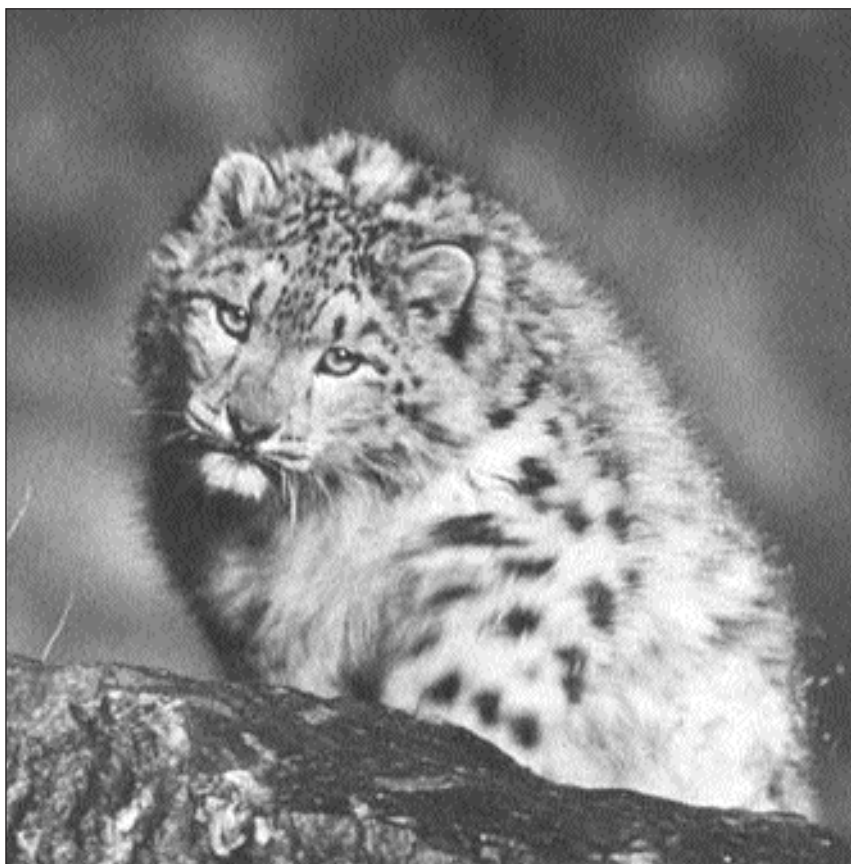
During the last decade, poaching of endangered species, including Snow Leopards, has sharply increased in Krygyzstan, Tajikistan, the Russian Federation and, to a lesser extent, in Kazakhstan and Uzbekistan (Koshkarev and Vyrypaev, 2000; Chestin, 1998; Poyarkov, 2002; Dexel, 2002). Not only the hunting of Snow Leopards themselves, but also poaching of wild ungulates and other small game for subsistence also increased dramatically, leading to a decline in the Snow Leopards natural prey base (Koshkarev and Vyrypaev, 2000).

The skins of Snow Leopards are mainly being sold to the so-called 'new Russians' and the slowly evolving 'upper-class' in the central Asian republics which were formerly Soviet territory, but also to foreign tourists and visitors (Dexel, 2002; Harder and Toropova, 2000; Koshkarev and Vyrypaev, 2000). Concerns have been raised about the demand for Snow Leopard bones for use in traditional Asian medicines and the additional incentive for poaching that this may create (Nowell, 2000). However, most trade in Snow Leopards reported from the central Asian range States and the Russian Federation has been in skins or live specimens and trade in Snow Leopard bones has not been reported in the region, although some traders seem to be increasingly aware of the potential of this additional source of income (E. Koshkarev, Altai State University, Department of Biology, *in litt.*, 2002; A. Poyarkov, Russian Academy of Science, *in litt.*, 2002).

Kazakhstan

The population of Snow Leopards is thought to be in decline as a result of poaching and a decline in the animals' prey base. Wild prey compete with domestic animals for grazing and are themselves poached and affected by other forms of human disturbance (E. Bykova, B. Grebot and E. Kreuzberg-Mukhina, Institute of Zoology, Uzbekistan and London Imperial College, *in litt.*, 2002). According to Wen (2002), in recent years around six to ten animals a year have been poached in Kazakhstan, of which several have been transported to China. Domestic livestock rarely come into contact with Snow Leopards in Kazakhstan and hence killings resulting from conflict with herders do not pose a significant threat to the species in this country (Yamaguchi, 2001).

Chestin (1998) reported that approximately 10 Snow Leopard skins a year were sold in the mid-1990s in the republic's capital Almaty, each skin for between USD3000 and USD7000, depending on the size, quality and customer. According to Chestin, the majority of the buyers were foreigners such as employees of foreign firms located in the country. Snow Leopard skins were also advertised for sale in local newspapers in the mid-1990s. In the late 1990s, prices for Snow Leopard skins offered on the black market in Kazakhstan seemed to increase and were reported to have been as high as USD10 000 (Yamaguchi, 2001).



Credit: Fritz Pölking, courtesy of the International Snow Leopard Trust

A wild Snow Leopard in its mountain habitat

Kyrgyzstan

A catastrophic decline in the number of Snow Leopards in Kyrgyzstan has been caused by a sharp upsurge in poaching and reduced numbers of wild prey animals. The population may have been reduced by 80% in the last 10-15 years (from 1200-1400 animals in the early 1990s, to 150-500 animals in the late 1990s), primarily as a result of poaching (Koshkarev, 1994).

Kyrgyzstan has a history of active hunting of Snow Leopards and at one time more than 90% of Snow Leopards caught for zoos originated from Kyrgyzstan (Dexel, 2002). Hunting intensity is reported to have quadrupled at the beginning of the 1990s and to have continued at similarly high levels throughout the 1990s. Koshkarev (1994) estimated that up to 120 animals a year were being poached in the mid-1990s, mainly for the skin trade, which compares to an average of 30 Snow Leopards caught each year prior to Kyrgyzstan's independence from the Soviet Union, in 1991 (Koshkarev and Vyrypaev, 2000). Whereas Snow Leopard skins had previously been traded for the price of a horse or five domestic sheep, in 1992/93 prices increased dramatically and a skin could be sold for around USD500-2000, which was equivalent to more than 60 times the minimum annual income in Kyrgyzstan. In the winter of 1993-1994, Koshkarev observed 12 Snow Leopard skins with a single trader in the village of Kyzyl-Su and another 10 skins were noted with another trader in Karakol. Traders claimed most skins were destined for the Russian Federation, China and Nepal, or for foreign visitors (Koshkarev, 1994).

New networks of hunters, middlemen and traders were established in Kyrgyzstan in the 1990s and these networks maintain links with traders in Kazakhstan, the Russian Federation and possibly China. In 1999, the German Society for Nature Conservation (NABU), active in Kyrgyzstan since the early 1990s, established a specialised anti-poaching team, working in close co-operation with the Kyrgyz Ministry of Environment, Emergencies and Civil Defence. This unit specifically targets illegal killing and trade of Snow Leopards, but also focuses on other wildlife offences, such as poaching of Snow Leopard prey species (Dexel, 2002). Hunting of lynx, Argali, ibex and marmots all increased in the 1990s, eroding the Snow Leopard's natural prey base (Koshkarev, 1994). Since its establishment, the anti-poaching team has confiscated three live Snow Leopards and 16 Snow Leopard skins, all of which had been sold, or were about to be sold, illegally within Kyrgyzstan. In addition, around 80 snares specifically designed to trap Snow Leopards have been confiscated by the group. Between 1998 and 2002, prices for the confiscated skins ranged from USD500 to 1500 and the price of live specimens was between USD6000 and 11 000 (Dexel, 2002). In February 2003, two Snow Leopard cubs were confiscated from a Russian circus that was touring in Kyrgyzstan. The two cubs were hidden in the bottom of a trailer in an attempt to smuggle them out of Kyrgyzstan. The authorities believe that the circus bought the two cubs while on tour in Kyrgyzstan and attempted to sell them abroad (Jumagulov, 2003).

Uzbekistan

Numbers of Snow Leopards have decreased in recent years, mainly because of increasing competition with other predators (including humans) for prey, because of over-grazing by livestock, and because of killings in retribution for loss of livestock and for financial gain (A. Esipov, E. Bykova and E. Kreuzberg-Mukhina, Asia-Irbis, *in litt.*, 2002). Although people living locally to Snow Leopards in Uzbekistan were reported to retaliate against attacks on their animals, they were held to have a generally benevolent attitude towards Snow Leopards (Kreuzberg-Mukhina *et al.*, 2002).

As in Kazakhstan and Kyrgyzstan, poaching of Snow Leopards for profit is reported from the 1990s, motivated by economic insecurity after the collapse of the former Soviet Union. It seems that deterrents against poaching were slight: in 1994, a man who had killed a Snow Leopard was fined USD10 (Chestin, 1998). Other isolated reports of Snow Leopard trade include an account of two Snow Leopard cubs, probably caught after the mother was killed, sold in 1998 to private individuals in Tashkent, capital city of Uzbekistan (A. Espinov, Chatkal Nature Reserve, *in litt.*, 2002) and a Snow Leopard skin offered for sale at a market in western Uzbekistan for USD3000, in 2001. According to the trader, the Snow Leopard was killed by wildlife guards of the Ugam-Chatkal National Park in the western Tien Shan mountain range, in response to pressure from the local herder community, following cases of Snow Leopard depredation of their livestock (A. Espinov, Chatkal Nature Reserve, *in litt.*, 2002).

Tajikistan

Snow Leopards are thought to have been severely impacted by civil war and its consequences in Tajikistan, such as poverty, habitat degradation and reduction of prey species (M. Kadamsharev, Pamir Institute of Biology, *in litt.*, 2002). In the past, Tajikistan has played a role in supplying live Snow Leopards for zoos and has had close ties with Kyrgyz traders (Heptner and Sludskii, 1972), some of which still exist today (Chestin, 1998). According to local reports

from the western Pamir region, there was very little interest in Snow Leopard skins until the mid-1990s and most animals were traded alive before this time. Sometimes villagers accidentally catch Snow Leopards in traps that were destined for wolves or other animals but, since the late 1990s, Snow Leopards have increasingly been killed with the incentive of trading in the animals' skins. It is estimated that up to 10 live animals a year were caught in 1996 and 1997 (Atobeck, Director of the Murgab Hunting Ground, pers. comm., 2002) and, in 1992, a German hunting party was offered the chance of hunting Marco Polo Sheep *Ovis ammon polii* and Snow Leopards in the Pamir Mountains (Cunha, 1997). From Tajikistan, the majority of the skins is transported to Kyrgyzstan for further trade, for example to the Russian Federation, or to wealthy people or foreign visitors in Dushanbe, capital city of Tajikistan. One skin was offered for sale in Dushanbe, in 1995, for around USD300-400 and around 10 skins were confiscated at the border with Kyrgyzstan by Customs officers (Chestin, 1998). Trade with Russian soldiers based in Tajikistan has also been reported (M. Kadamshoev, Pamir Institute of Biology, *in litt.*, 2002).

As in Uzbekistan, shepherds have been reported to pursue Snow Leopards threatening their livestock, but not to harbour general hostility towards Snow Leopards (Kreuzberg-Mukhina *et al.*, 2002).

Russian Federation

Illegal killing, loss of prey species, as a result of extensive hunting of wild ungulates, retributive killings following the taking of domestic livestock and accidental killings with traps and poison laid for other animals are all threats to Snow Leopards in the Russian Federation. The main reason for illegal killings of Snow Leopards is likely to be a desire to trade in their skins (Poyarkov, 2002).

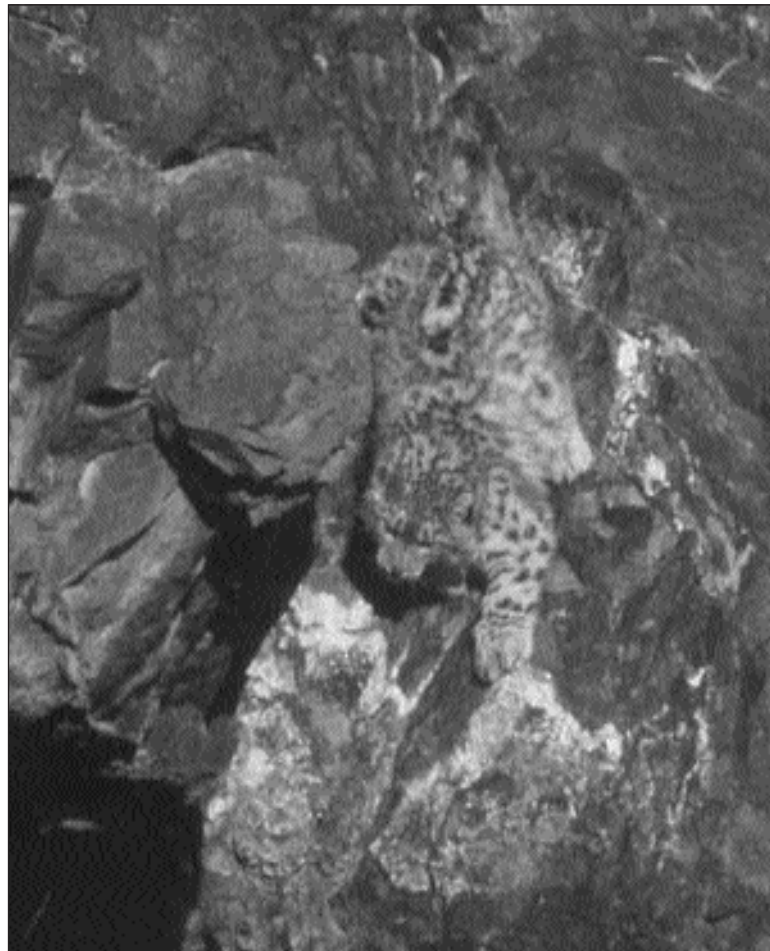
Altay-Sayan, Khakasia, Krasnoyarsk Krai

At an international conference held in the Sayan-Shushinski National Reserve in March 1999, representatives from the Russian Federation, Kazakhstan and Mongolia noted a dramatic increase of Snow Leopard killings in the "Altai-Sayan Ecoregion" (a vast mountainous area that lies across the borders of the Russian Federation, China, Mongolia and Kazakhstan, designated a region crucial to the conservation of biological diversity by WWF). In most instances, this increase was directly related to an increased demand for Snow Leopard skins. There are several reports of Snow Leopards poached in the Russian part of the Altay-Sayan Ecoregion and it is estimated that up to 25 animals are killed each year, from a population of around 120-150 individuals (Poyarkov, 2002). Poaching is reported to occur in response to orders from dealers from Novosibirsk and Krasnoyarsk (Siberia) and Yekaterinburg (in the eastern foothills of the Urals). Poyarkov (2002) reports that in Krasnoyarsk Krai (central Siberia), Chinese middlemen and traders are increasingly involved in the trade and sale of wildlife products and have started to set up networks of contacts. A similar scenario is reported from Novosibirsk, Siberia's largest city, described as an important centre for illegally traded Snow Leopard skins (Poyarkov, 2002). The most common methods used to hunt Snow Leopards is with a noose trap. However, Snow Leopards are also accidentally caught in traps intended for other animals. For example, six Snow Leopards were reported to have died in musk deer traps in the Krasnoyarsk Region and scientists of the Sayan-Shushinski Nature Reserve in the Altai Republic estimate that up to three

Snow Leopards are accidentally trapped each year in musk deer traps (Poyarkov, 2002). However, the skins of Snow Leopards trapped accidentally probably also enter trade.

Tyva Republic

A dramatic increase in Snow Leopard killings has also been reported from the Tyva Republic. This region has relatively high numbers of domestic livestock, unlike the other parts of the Snow Leopard's range in the Russian Federation, and livestock depredation is reported to be an increasing problem in the Republic. Snow Leopards here are also negatively affected by the loss of prey species, as a result of extensive hunting. Ibex populations, especially, have decreased considerably (Poyarkov, 2002). However, killings motivated by the high value of Snow Leopard skins also occur regularly and it is estimated that between three and four animals are killed each year (Poyarkov, 2002).



Credit: Fritz Pölking, courtesy of the International Snow Leopard Trust

Wild Snow Leopard exceptionally well camouflaged against rocks

CONSERVATION EFFORTS: SOME EXAMPLES

Effective legislation to outlaw Snow Leopard killings and trade and to prevent unsustainable killing of its prey species, combined with effective enforcement are needed as a minimum to protect the species. Moreover, since conservation of the species is inextricably connected with the livelihoods of humans in its proximity, efforts to conserve it can only be effective if they provide benefits and incentives that encourage these people to live with Snow Leopards and even protect them.

The following examples of conservation projects are intended to provide insight to a range of approaches that have been taken to address Snow Leopard conservation.

Mongolia: Alternative income generation schemes for local herders

With the aim of addressing conflicts between herders and Snow Leopards in Mongolia, Irbis Mongolia, the Mongolian branch of the International Snow Leopard Trust, has set up Snow Leopard Enterprises. Formerly known as Irbis-Enterprises (*irbis* is the Mongolian word for Snow Leopard), this community-based conservation programme offers herders an opportunity to increase their household income through handicraft sales, in return for a commitment to protect the Snow Leopard and its natural prey. This includes tolerating livestock losses, no killing of Snow Leopards or their natural prey, avoiding sites where Argali and ibex are rearing their young, and reducing or stabilizing livestock herd sizes. These agreements are policed by project biologists and national park staff. At the end of each year, herders receive a 20% bonus on all sales if all contract conditions have been met. However, the entire community loses this incentive if just one person has violated the contract. Financial benefits, as well as peer pressure, thus provide a powerful reason for herders to participate in, and abide by, the scheme.

The project provides training and equipment necessary for the herders to produce hand-made, woollen goods that are marketed both nationally and internationally. The majority of the sale price is returned to the herders, but 10% is placed into a conservation fund that can be used for improving the community's infrastructure, for example by securing water sources. The project was developed with an awareness that herders were receiving low prices for their raw animal products and that better rates could be obtained by selling finished products. For example, one

Credit: Irbis Mongolia/ISLT



Camel wool hats and other products made by Snow Leopard Enterprises

kilogramme of raw camel wool sells for about USD1, but one kilogramme of camel wool can also be made into four hats, each selling for around USD4. Furthermore, long distances to market often leave herders dependent on middlemen to sell their raw goods, whereas the finished products are marketed and distributed

by Snow Leopard Enterprises direct from the makers. Products can be bought at www.snowleopard.org and www.irbis-enterprises.com.

Currently the project is working with 300 participants from 200 households in Mongolia and has been initiated in communities in India, Kyrgyzstan and Pakistan. It is believed to have increased awareness among herders and the local community of the value and benefits of wildlife and therefore to have reduced the threat to Snow Leopards and their natural prey in a measure that extends beyond the scheme itself.

Ladakh, India: Promoting community-based eco-tourism - traditional village “homestays”

In 2001, the Snow Leopard Conservancy, in partnership with The Mountain Institute and the United Nations Educational, Scientific and Cultural Organization (UNESCO), initiated the Traditional Village Homestay programme as a pilot project in Hemis National Park (see www.snowleopardconservancy.org/eco-tourism.htm). The goal of these eco-tourism programmes is to empower local communities to benefit directly from an eco-system that includes Snow Leopards, through income-generation schemes. Training and support was provided to co-operatives of village women in Ladakh to offer traditional accommodation to foreign tourists in so-called homestays and to run a small restaurant that serves trekkers during the tourist season. Emphasis is placed on environmentally friendly practices, including good waste management, the use of natural gas and kerosene for cooking, instead of scarce firewood or yak dung, and the sale of pressure-boiled, filtered water to minimize use of plastic mineral water bottles. Solar cookers and solar water heaters were provided as a subsidized loan, contributing to the hygienic, ecologically friendly and sustainable operation of these facilities. In 2002, a workshop was organized that covered housekeeping, cooking, communication, interpretation and codes of conduct by visitors and hosts. In 2003, the programme was expanded to other areas in Ladakh, as well as to Lahul-Spiti, and training was provided for local people to act as wildlife and cultural guides for tourists. Guide handbooks and reference materials are provided for the villagers, including a “Homestay Manual” and educational materials for local schools.

Ladakh, India: Corral improvements and training herders in livestock protection and husbandry

The ravaging of domestic stock by Snow Leopards would often be preventable with better protection. The Hemis National Park, located in Ladakh, in Jammu and Kashmir, north-west India, is home to Snow Leopards but also to 16 small human settlements and around 4000 head of livestock. A survey in the area indicated that more than half of the households had lost between one and 10 per cent of their livestock to predators over a 14-month period. The average household lost six animals, valued at almost USD300, and the total loss in the Park was estimated to be some USD23 500, between January 1998 and February 1999. Snow Leopards were said to be responsible for 55% of these kills.

The Snow Leopard Conservancy (www.snowleopardconservancy.org) and The Mountain Institute initiated a programme in 1999 to provide livestock with better protection from predators. In collaboration with the inhabitants of Markha, the village with the highest

predation rate in the Hemis National Park, predator-proof corrals were built in 2000, using wire mesh, poles, secure doors and concrete, together with locally available stones, mud and labour contributed by the villagers. During the construction phase, a Snow Leopard attacked stock, but because of the participatory nature of the project and the high level of support from the village, the project was completed without retaliatory action against Snow Leopards in the area. Since the completion of the corrals, no livestock have been lost to predators.

The corral reinforcement project followed in the wake of an earlier scheme, set up in 1994 to provide financial support to herders following livestock predation. This project failed owing to its high costs and limited budget. Losses claimed by herders required more than two years to settle and the Wildlife Department needed to spend 60% of its annual budget on the scheme, although payments received by herders were only 20-30% of the market value of the animal killed. In addition, some herders had to walk for up to three days to report their losses and wildlife rangers had to verify the claims before approving any case for the scheme.

The findings of this project showed that, by addressing the concerns of local people for the safety of their livestock by proofing corrals against predators, five or more Snow Leopards per site were removed from the risk of retributive killing. Since these barriers to predators can eliminate multiple killing of livestock by Snow Leopards, they are especially important and effective from a conservation action standpoint (R. Jackson, *in litt.*, 12 July 2003).



Credit: Rodney Jackson, Snow Leopard Conservancy

Remote-camera photo of Snow Leopard in Ladakh, India

Pakistan: Community-based trophy-hunting programmes

Pakistan has several trophy hunting programmes with conservation goals. Although not directly related to Snow Leopard conservation, these contribute to the conservation of its prey species. The value of trophy-hunting in community-based conservation lies in the revenue that can be

raised for re-investment into wildlife conservation. The primary goal of such programmes should be the conservation of wildlife and habitats and this is achieved through the devolution of any benefits to the local community (Shackleton, 2001).

The longest running community-based trophy-hunting programme in Pakistan is the Torghar Conservation Project (TCP), established in 1986 on tribal lands in the Torghar range of north-west Balochistan (Johnson, 1997, Shackleton, 2001). This project was initiated in response to concerns about the status of the Afghan Urial *Ovis orientalis cycloceros* and Markhor *Capra falconeri jerdoni* populations in the Torghar Hills. It aims to stop poaching and uses the revenue from the sale of trophy hunts to hire local people as wildlife guards if they agree to stop poaching (Shackleton, 2001). In 1994, TCP was formalized as a registered NGO - the Society for Torghar Environmental Protection (STEP). In its first 10 years it generated about USD460 000 from hunts of 14 markhors and 20 urials (Johnson, 1997). In 2001, STEP employed 55 local game guards from several sub-tribes. The positions are distributed equitably across the sub-tribes, which select the game guards, and this has the advantage that, not only are the efforts of the game guard himself recruited against poachers, but also those of most of the male members of his sub-tribe (Shackleton, 2001).

Balistan, Pakistan: Livestock insurance schemes

Project Snow Leopard is a community-based approach that aims to resolve the conflict between local farmers and Snow Leopards in northern Pakistan. The project was initiated in 1999 with a small grant from the Whitley Foundation and is implemented in the community of Skoyo, in the Baltistan region of northern Pakistan. The scheme works by combining an insurance system with eco-tourism: farmers pay insurance premiums per head of livestock into a fund managed and administered by the community of Skoyo. The community and Project Snow Leopard staff administer the income so generated for Snow Leopard-based eco-tourism, which is likewise jointly organized. The concept behind the scheme is to provide farmers with incentives to change their behaviour to protect Snow Leopards. Compensation in case of livestock losses to Snow Leopards aims to remove the incentive for farmers to kill the cats, while additional income through eco-tourism provides farmers with a positive incentive to conserve the local Snow Leopard populations. Through an emphasis on community participation and the integration of local institutions in the management and operation of the scheme, the possibilities of fraud are reduced. This feeling of ownership of the scheme is an important component. Because the villagers see their collective pool of money, generated from “their” common resource - the Snow Leopard, a false claim by one individual would mean defrauding the whole community.

Since the start of the scheme, seven claims have been filed. They have all been approved and compensation has been paid out. Surveys in the area show that the Snow Leopard population in the area is stable and perhaps increasing. There are plans to add corral improvements (with barbed wire, wire mesh and iron posts) as a new component to the project and it is hoped that this will substantially reduce livestock depredation rates, thus decreasing the number of claims made to the insurance scheme. The money saved in this way can be invested in infrastructure in and around the villages, to facilitate eco-tourism (Hussain, 2002).

A similar scheme was set up by WWF Russia in the Tyva Republic of the Russian Federation, in 2000.

Cambodia: Community-based protection for Tigers

In 1997, the NGO Cat Action Treasury (CAT) (www.felidae.org) began working with Cambodia's Wildlife Protection Office to identify skilled hunters around the country, to access their knowledge of wildlife. The aims of the programme - The Cambodia Tiger Conservation Programme, now also referred to as the Community Wildlife Ranger Programme, are:

- to reduce Tiger poaching and trade;
- to increase awareness among rural Cambodians of the importance of wildlife conservation;
- to develop a community-based monitoring system, to gather biological data to improve government management of Tiger information.

Former Tiger hunters are hired as community wildlife rangers and paid to protect Tigers rather than poach them. The rangers also carry the message of Tiger conservation to the remote rural villages where they live. The programme encourages the education of local communities and individual hunters. When a hunter is discovered carrying out an illegal activity, the ranger informs the hunter of the regulations and the reasons for these. The hunter is then asked to sign a "no-hunting contract", whereby he agrees that he has understood the information and commits to stop any illegal activity regarding wildlife. The hunter is also notified that, in case of recidivism, he would be prosecuted and the information recorded on the contract would be used as evidence (Kimsan *et al.*, 2002). Since the establishment of the programme, the level of Tiger poaching in Cambodia has been significantly reduced and is much lower than in the mid-1990s (Kimsan *et al.*, 2002).

Kyrgyzstan and Mongolia: Strengthening law enforcement

As mentioned earlier, illegal killing of Snow Leopards has increased many-fold during the last 10 years or so in Kyrgyzstan. In 1998, the German Society for Nature Conservation (NABU) (www.nabu.de) developed a national conservation strategy, with the primary aim of stopping Snow Leopard poaching, in co-operation with the Kyrgyz Government and local experts. In 1999, the group established a specialized anti-poaching unit, the so-called 'Gruppa Bars', a team of five, plus support staff. The unit works as a part of the enforcement department of the Ministry of Environment, Emergencies and Civil Defence and with the Ministry of Domestic Affairs and is authorized to arrest suspects and to confiscate fire arms or illegally obtained wildlife or their parts. Since 1999, the Gruppa Bars has dealt with 178 wildlife offences and confiscated three live Snow Leopards, 14 Snow Leopard skins, two lynx skins, 65 marmot skins, eleven Argali trophies and 13 ibexes. One hundred and ten people have been arrested, 162 arms confiscated and 232 traps and 119 snares, including 79 snares specifically designed for Snow Leopards, have been destroyed.

WWF Mongolia has similarly established an anti-poaching team operating in Uvs Province, western Mongolia. A network of informers and volunteer rangers work at different project sites as part of a larger project, that includes measures to increase public awareness about Snow Leopard conservation, to support community development initiatives, such as Snow Leopard-Enterprises, to foster wildlife-friendly herding practices and to reduce conflicts between herders and Snow Leopards.

Snow Leopard Survival Strategy and the Snow Leopard Network: Mobilizing knowledge and prioritizing conservation needs at global level

In February 2001, the International Snow Leopard Trust initiated development of the Snow Leopard Survival Strategy (www.snowleopard.org/sln), by inviting 40 Snow Leopard experts from the 12 range States and from North America and Europe to participate in providing comprehensive conservation and research guidelines to ensure a co-ordinated effort to conserve Snow Leopards throughout their range. The Strategy was designed after thorough analysis of the threats facing the species in each range State and attempts to identify conservation, education and policy measures needed to address these threats, to determine the most urgent information needs and provide advice on appropriate methodologies.

Information for the Strategy was gathered through a survey addressing various issues, including perceived threats, appropriate conservation actions, knowledge gaps, protected areas status and policy and legislative status. The results of the survey were compiled and the Strategy finalized at the Snow Leopard Survival Summit, that took place in May 2002, in Seattle, USA. The summit brought together fifty-two experts from 17 countries, including representatives from 11 of the 12 Snow Leopard range States. Several new initiatives and recommendations were agreed upon, including the need for better co-ordination among the various organizations engaged in Snow Leopard conservation and for broader public awareness. A new group, the Snow Leopard Network, a partnership of organizations and individuals from governments and the private sector, was accordingly formed. The mission of this network is to promote sound, scientifically-based conservation of Snow Leopards, through networking and collaboration between individuals, organizations, and governments. To accomplish this, it will establish and strengthen professional links for addressing the crucial issues affecting the survival of the species itself, its prey species, and the livelihood opportunities of people living locally to Snow Leopards. The Snow Leopard Network will be chaired by the International Snow Leopard Trust for the first two years and a seven-member steering committee will set the direction for the group.

CONCLUSIONS

Despite their high-altitude existence, in rugged mountain terrain in some of the least populated areas on earth, Snow Leopards have probably been killed in numbers as high as ever before in recent years. Such killings are illegal, almost without exception, and often warrant a substantial penalty under national laws, yet they are nonetheless one of the most menacing threats posed to the survival of the Snow Leopard. The primary motives for these killings vary considerably between geographical regions, depending on social, economic, political and environmental factors. In general, poverty, economic instability, lack of resources and lack of awareness and political will are important root causes for these killings and any subsequent trade of Snow Leopard body parts. As such, enforcement of national laws to protect Snow Leopards is vexed by these factors, especially considering the attraction of high profits to be made from trading in Snow Leopard parts and the desire among herders to safeguard their stock from this predator. Such regulatory devices for controlling trade in Snow Leopards, although one of the approaches to conservation of the species, should by no means be seen as the only one. Since human communities living in or near Snow Leopard habitat are often operating at subsistence level, in

a physically harsh environment, Snow Leopards in these circumstances are most likely to benefit from supportive schemes designed to protect local human livelihoods also.

Decline in availability of wild prey is coupled with intentional killing as a foremost threat to the species. Populations of wild ungulates, such as Blue Sheep, Argali and Siberian Ibex, which form an important part of the Snow Leopard's natural prey, have decreased in recent years. Habitat fragmentation and accidental killing (by traps or poison laid for other animals) are subsidiary threats, but to a greater or lesser degree, the various threats to Snow Leopards are inter-related.

Loss of wild prey can be caused through degradation of ungulate habitat, mostly caused by overgrazing of domestic livestock and by unmanaged hunting of ungulates, mainly for subsistence, and of other prey species by humans. These circumstances can lead Snow Leopards to take domestic animals for their prey and such incidences are often reported from areas where populations of wild ungulates have decreased. This predation on domestic livestock leads to conflict between herders and Snow Leopards and, as such, the lack of natural prey poses both a direct and indirect threat to the animals.

Killings by herders in retaliation for, or in prevention of, livestock depredation are seen as the prime threat to Snow Leopards in Bhutan, India and Nepal, and such conflict with herders is probably the first reason for Snow Leopard killings in Mongolia. This type of threat is also considerable in Afghanistan, Pakistan and the Himalayan region of China. For herders, the effect of losing livestock to Snow Leopards can be devastating, sometimes amounting to the equivalent of up to 20% of the household's annual income. The result is that herding communities affected by predatory attacks feel completely justified in ridding themselves of local Snow Leopards.

Even in those countries where protection of livestock is a paramount concern, an awareness of the potential income to be gained from Snow Leopard parts means that these enter trade, even though this was not the primary incentive for killing. The value of a Snow Leopard skin is relatively high and, in some instances, can be equivalent to the annual income of a herder family.

Killing Snow Leopards for trade is considered the main threat to the species in the Russian Federation and Kyrgyzstan, and this is probably the prime threat in Kazakhstan, Tajikistan and Uzbekistan. Although killing Snow Leopards in defence of domestic stock is reported from Uzbekistan and from the Tyva Republic in the Russian Federation, this threat is generally less significant to the species in the central Asian part of its range, than in the Himalayan region. Whether killed to protect livestock, for financial gain, or for a mixture of these motives, Snow Leopards are traded in all range States, with the exception of Bhutan, for which no information on this subject was available.

Although it is difficult to assess the overall numbers of Snow Leopards killed each year for trade, the information compiled in this report provides real cause for concern. A sharp rise in Snow Leopard hunting for trade during the last decade of the twentieth century is reported, especially from the central Asian range States and Russian Federation. This is largely attributable to the collapse of law and order and the financial insecurity following in the wake of the dissolution of the Soviet Union and expanded market possibilities in East Asia and the Russian Federation. The result has been unchecked targeting of Snow Leopards, as a source of income,

and of their prey for subsistence and profit, in some countries. Information from Afghanistan, Kyrgyzstan, Mongolia, Pakistan and the Russian Federation suggests that trade in Snow Leopard skins has increased over the past 10 years and, in some cases, significantly impacted populations of the species. Of particular concern are the high levels of poaching and trade reported from Kyrgyzstan, a country that once hosted one of the largest populations of Snow Leopards, but which may be reduced to a couple of hundred animals. Trade in Snow Leopard skins in Mongolia during the 1990s is reported to have been at its briskest in the mid-1990s, in response to political and economic changes in the country and new trade opportunities in neighbouring countries. In Afghanistan, the new trade potential presented by the arrival of foreign workers appears to be contributing to an increase in Snow Leopard hunting for trade in that country, though levels of hunting and trade under the previous regime are unknown.

Pelts appear to be the main Snow Leopard product in demand, but there is evidence of illegal trade in live Snow Leopards and in other body parts such as bones, teeth, nails and meat, on a much smaller scale. The scale of the trade in Snow Leopard bones and recent trends in the bone trade are not well understood and it is unclear whether Snow Leopard bones are a “by-product” of the skin trade or a main incentive for poachers. More information is needed to evaluate whether or not the demand for bones has increased in recent years, as legislation and enforcement to prohibit trade in Tiger bones has been strengthened.

Prices for Snow Leopard skins were found to vary widely, depending greatly on location, sales context and other factors. At the lowest end of the scale, a hunter in Nepal is reported to earn just tens of US dollars for a Snow Leopard skin, although this is comparable to the yearly income of a herder in that country. In Mongolia, Snow Leopard skins have fetched around USD50-180 at rural markets in recent years, but prices were up to USD800 in tourist shops in Ulanbaatar. In Pakistan, Snow Leopard skins were offered during 2002 for approximately USD350-500 at market stalls, but Pakistani traders reported much better prices for Snow Leopard skins if traded over the border in Kabul, while skins traded from Mongolia to the Russian Federation were reported to fetch four or five times less than those originating from within the Russian Federation itself. The highest prices recorded for Snow Leopard skins reach several thousands of dollars: prices quoted on the black market in Kazakhstan in the mid-1990s were reported to be as much as USD10 000.

Some groups and/or regions emerge as consumers of Snow Leopard skins. In Pakistan, Mongolia, the central Asian republics and the Russian Federation, there is a demand for the skins at national level, chiefly among politically and economically influential people. Foreigners and tourists represent another group of consumers and there are several reports of Snow Leopard skins being offered and/or sold to tourists and foreign visitors at markets in Afghanistan, China, and Mongolia, while in Pakistan they are available in markets regularly visited by tourists. Afghanistan, China, Europe, the Middle East and the Russian Federation were cited as destinations for Snow Leopard pelts exported from Pakistan and China, and Europe and the Russian Federation were mentioned as destinations for skins from Mongolia. Snow Leopard bones in international trade (from Nepal) were reportedly destined for China. Recent advertisements for Snow Leopard skins in international media are further indications of a demand at global level for such goods. Even though demand for Snow Leopard bones, and even skins, may be relatively small in scale, the profit involved is apparently still significant enough to support an illegal trade across international borders.

RECOMMENDATIONS

The information presented in this report relates to a range of threats to Snow Leopards, which are often inter-related and which shift in prominence with geographical context. Therefore, different actions are required in different parts of the Snow Leopard's range. Bearing in mind that some proposals will be of greater importance, or applicable only in certain parts of the Snow Leopard's range, the following recommendations are made. The order of listing does not denote order of priority for action.

Strengthening national legislation and conservation policies

- **Legislation gaps**
Range States should address any gaps in legislation, to ensure that Snow Leopards are fully protected by law. Although Snow Leopards are protected by law in every range State, with the possible exception of Afghanistan in its transitional state, there are gaps in the legislation of some countries. In order to provide full legal protection for Snow Leopards, range States should ensure that legislation specifically outlaws hunting, possession, sale and trade of Snow Leopards, including all their parts, derivatives and products made from these, and that the legislation is applicable to all regions of the country, including those where Snow Leopards do not occur.
- **Legal assistance and advice**
CITES Parties, the CITES Secretariat, inter-governmental organizations and NGOs should offer advice and assistance to Snow Leopard range States in revising or drafting legislation relevant to the protection of Snow Leopards.
- **Sufficient penalties**
Snow Leopard range States should ensure that penalties for breaking laws related to Snow Leopard conservation are sufficiently high to act as a deterrent to those tempted to kill or illegally trade Snow Leopards. As a minimum, fines imposed should be comparable to the retail value of the commodity traded, taking into account the value of Snow Leopards at international markets.
- **Whistle blower policies**
Range States should consider the development of so-called “whistle blower” policies that provide incentives to report illegal activities, such as the killing, possession or trade of protected animals. The anonymity of the informants should be vouchsafed. Experiences from similar schemes already in use, as in Mongolia, should be taken into account.
- **CITES and Asian big cats**
CITES Parties, in particular Snow Leopard range States, are urged to implement the recommendations made in CITES *Resolution 12.5 Conservation of and trade in Tigers and other Appendix-I Asian big cat species* and to undertake the actions recommended in CITES *Decision 12.29* and *Decision 12.30*. Where appropriate, range States should seek the assistance of national and/or international bodies in compiling the information and exploring the approaches requested by these Decisions.

- ***CITES membership***
Snow Leopard range States not Parties to CITES, that is Kyrgyzstan and Tajikistan, should be urged to join the Convention as a matter of urgency. These two countries should proactively seek the technical assistance of the CITES Secretariat, CITES Parties, inter-governmental organizations and NGOs in drafting CITES-implementing legislation and in establishing the relevant administrative capacities.

Strengthening law enforcement capacity

- ***Strengthen trade controls on known trade routes, at markets and cross-border points***

Field patrolling is difficult in many areas of the Snow Leopard's range, however **known trade routes, wildlife markets and important border crossings, for example along the Kyrgyz-Chinese border, the Pakistani-Afghanistani border and the Nepalese-Chinese border, should be regularly controlled by efficiently equipped and trained staff.** Strong links between these teams and all other relevant agencies responsible for enforcing wildlife protection laws must be maintained to facilitate the exchange of intelligence, increase the understanding of trade routes and dynamics and to avoid duplication of efforts. In addition, regional and international links and co-operation should be established and/or strengthened, in particular between neighbouring countries where smuggling of Snow Leopard products has been reported. Where appropriate, undercover investigations should be considered as a means of successful enforcement and collection of intelligence.

- ***Establishing anti-poaching teams***

Governments of range States should consider the establishment of specialised anti-poaching teams to counter the illegal killing of and trade in Snow Leopards. These teams should be well trained and effectively equipped and should work with local communities, establishing local contacts and keeping these informed of the team's role and activities. These teams should also work closely with other wildlife enforcement units. Governments should consider training and hiring former wildlife poachers as rangers to provide them with an alternative income and to access their knowledge on wildlife, hunting and trade routes. The experiences of similar anti-poaching teams, such as the "Tiger brigade" in the Russian Far East, the "Gruppa Bars" in Kyrgyzstan and the Community Wildlife Ranger Programme in Cambodia should be taken into account. Where appropriate, the assistance of NGOs should be sought to help with the design, founding and administration of such groups.

- ***Regular monitoring of major markets and known trade centres***

Governments, where appropriate in co-operation with NGOs, should regularly monitor markets and other locations where Snow Leopard skins and other products have been frequently offered, most notably markets and tourist shops in Kashi, China; the fur shops and stalls in Namak-Mandi and Kissa-Khawani markets in Peshawar, Pakistan; and the fur shops in Kabul.

- ***Technical enforcement assistance***
Inter-governmental organizations, NGOs, the CITES Secretariat and other relevant organizations should offer technical support to all Snow Leopard range States to improve and strengthen the implementation and enforcement of CITES, as well as of other applicable multi-national environmental treaties. Such assistance should focus in particular on building capacity and providing hands-on training for enforcement personnel, particularly those in known trade “hot spots”, in investigating poaching, illegal wildlife trade and the most common smuggling techniques.
- ***Disposal of seized Snow Leopard items***
Governments of Snow Leopard range States should adopt clear policies regarding the disposal of seized Snow Leopard products and ensure that these do not re-enter trade. Seized specimens should be marked and registered and kept in safe storage, used for educational and/or scientific purposes, or destroyed.
- ***Identification material***
Governments, where appropriate with the assistance of NGOs, should develop practical and user-friendly identification manuals to aid enforcement personnel in the detection and accurate identification of Snow Leopard body parts. These could be made widely available and need not be restricted to use by enforcement agents.

Protecting livestock from Snow Leopard predation

- ***Herding practices***
Governments should co-operate with communities and NGOs at local level to encourage herding and guarding practices that reduce depredation by Snow Leopards and other predators. For example, where possible, herds should not be left unattended and should be guarded by experienced, adult herders. Larger herds should be guarded by more than one person and the suitability of using guard animals, such as dogs, should be explored. Examples from other regions and best practices from other cases of predator-livestock conflict management (for example, with wolves or Leopards) should be taken into account and, where appropriate, applied after analysis of the local circumstances.
- ***Predator-proof corrals***
Governments and NGOs should assist local communities in the construction of predator-proof corrals, night shelters and other means of livestock protection, for example through providing the appropriate materials and techniques to prevent Snow Leopards and other predators from entering. The long-term sustainability of such measures should be taken into account, especially if materials required for constructing the corrals and shelters are not readily available to local communities.

Protecting and/or recovering the natural prey base of Snow Leopards

- ***Grazing management and animal husbandry***

Governments, resource managers, conservation NGOs and development agencies should undertake efforts that will help to promote livestock grazing practices that **reduce impacts on native wildlife**. Community-generated grazing management plans should be developed after a careful analysis of land tenure systems, grazing patterns and wildlife needs (range, key lambing/kidding sites, winter pastures, etc.). The grazing plans should contain monitoring protocols and indicators of success and regular progress reports should be disseminated among participating stakeholders. In addition, information, training and technical assistance for animal husbandry should be provided to local communities to increase the economic value of the stock, thereby creating the possibility to reduce the number of animals grazing. Focus should be applied to areas where over-grazing by domestic livestock has led to declines in wild ungulates and where Snow Leopard predation is reported to be high. One option of value would be to prioritize allocation of pasture, so that in some areas wildlife is given precedence over domestic stock, for example at wildlife-viewing sites in protected areas.

- ***Unregulated/illegal hunting of prey species***

Governments, NGOs, scientific and other relevant institutions should **compile information on the levels and impact of illegal hunting and/or unregulated hunting of wild ungulates and other Snow Leopard prey species** in Snow Leopard range States and the motives that lead to the poaching of wild ungulates and other mammal species (i.e. subsistence, trade of certain body parts, minimizing competition with domestic livestock, etc.).

- ***“Pest control” programmes and the use of Tiger bone substitutes***

Governments, scientific institutions and NGOs should encourage, initiate and support research studies on the impacts of so-called “pest” control programmes for smaller mammals that are important Snow Leopard prey species, such as pikas, and mole-rats, the bones of which are also promoted as an official substitute for Tiger bones.

- ***Prey species conservation and management***

Governments, scientific institutions and NGOs should encourage and support studies that **focus on the biology, population trends and habitat needs of wild ungulates**, in particular those that are known to be important Snow Leopard prey species, to improve the understanding of the most important threats posed to these species and investigate the specific effects that livestock and human activities have. The findings of these studies should be used to promote effective management of protected areas in key habitats, i.e. those that support important populations of wild ungulates. Assistance should be provided to range States to implement existing management plans for protected areas and to create new plans for protected areas, where necessary.

Providing human communities living locally to Snow Leopards with economic incentives for their conservation

- ***Income generating schemes***

Governments, resource managers and NGOs should assist local communities in the design, establishment and implementation of schemes that provide economic incentives to protect Snow Leopards and wild ungulates. Snow Leopard Enterprises is an example of such a wildlife stewardship scheme, where conservation agreements are signed with communities willing to protect Snow Leopards and their habitats, in exchange for economic incentives and/or skills training. These schemes could result in the generation of income which would eradicate the need to rely on poaching of wildlife, and would enable herders to tolerate livestock losses to Snow Leopards, to a certain extent. Ultimately, these programmes could result in a lesser dependence on livestock as a means of livelihood, owing to the additional income generated and the increased use of more productive breeds. The involvement of a wide range of local stakeholders in the design and development of these schemes is critical to their success. Products from such schemes should be promoted in the media and via conservation NGOs, particularly in affluent countries, as beneficial to Snow Leopard conservation.

- ***Livestock insurance schemes***

NGOs, development agencies and resource managers working with local communities in Snow Leopard range States should assist local communities in developing livestock insurance schemes, where appropriate. Taking into account lessons learnt from livestock insurance schemes already in place, attention should be given to ensure that these systems are economically sustainable, locally administered and effective in preventing retaliatory killings of predators. These schemes should be designed and developed in close co-operation with the affected communities and should incorporate a livestock insurance plan where stock owners contribute to a common fund, administered at local level, thus reducing likelihood of fraud and other problems inherent in direct compensation.

- ***Community-based trophy-hunting programmes***

Governments, resource managers, hunting agencies and NGOs should assess the feasibility of establishing programmes for community-based trophy-hunting of wild ungulates and other mammals, as a tool to provide economic incentives for local communities to conserve wildlife and habitats. The revenue generated from these hunting programmes should be re-invested into conservation programmes that aim to provide incentives to local communities to conserve wildlife and its habitat. These could be administered through community-based conservation trust funds. The programmes should also be accompanied by regular scientific surveys that monitor potential impacts on the population of the affected species.

- ***Tourism programmes***

The establishment of conservation-based tourism programmes should be promoted, to bring additional income to local communities through the establishment of conservation trust funds. Such programmes, for example Traditional Village Homestays in Ladakh, should take into account the environmental, socio-economic and cultural risks

and benefits associated with their establishment and should be designed in co-operation with all relevant stakeholders.

Minimizing “non-targeted” killings of Snow Leopards

- ***Non-selective trapping methods***

The use of non-selective trapping and poisoning methods used in some Snow Leopard range States should be considered, with a view to minimizing the risk of trapping the “wrong” animal.

Raising awareness of the threats to Snow Leopards

- ***Local communities***

Local governments, NGOs and other organizations working with local communities should develop education and awareness-raising programmes for local communities living in, or close to, Snow Leopard habitats. These information programmes should be developed in close co-operation with local stakeholders and be tailor-made for the specific information needs and cultural background of each stakeholder group involved, as well as paying regard to concerns that may exist at local level, for example, with respect to Snow Leopard predation of domestic livestock, over-grazing or herding and guarding practices.

- ***Potential consumers***

Governments, NGOs, resource managers and other stakeholders, such as travel agencies, should co-operate to develop awareness-raising and education materials to inform potential consumers about the conservation status of Snow Leopards, the threats faced by the species and relevant legislation for their protection. Targeted information, such as “buyer-beware” brochures, leaflets, posters and web-based information should be provided to potential consumers of Snow Leopards products, including tourists, sport hunters, business travellers, military personnel and international aid personnel working in Snow Leopard range States. Information should be made available through the general media, specialized magazines and the internet. Co-operation from bodies as a whole should be sought, for example from the armed forces and those engaged in the legal fur trade.

- ***Governments in range States***

Education programmes aimed at increasing public awareness of the problems besetting Snow Leopard conservation, including conflicts with herders, poaching, and illegal trade involving government officials, especially those responsible for law enforcement in Snow Leopard range States, should be initiated. In addition, governments are urged to strengthen co-operation with local wildlife managers and community stakeholders, to find ways to increase the capacity of authorities responsible for managing wildlife, to implement and enforce the relevant wildlife conservation laws, and improve co-operation with governmental and non-governmental institutions at regional and international level.

FOOTNOTES

¹ Six other cat species are classified as big cats (the Cheetah *Acinonyx jubatus*, Clouded Leopard *Neofelis nebulosa*, Jaguar *Panthera onca*, Leopard *Panthera pardus*, Lion *Panthera leo*, and Tiger *Panthera tigris*).

² Those central Asian republics with Snow Leopard populations are Kazakhstan, Krygyzstan, Tajikistan and Uzbekistan.

³ Red Data Book: a list of a country's rare and endangered species. All of the countries in central Asia, which were part of the former Soviet Union have produced and published Red Data Books. Most of these publications have unfortunately used a qualitative approach in determining the conservation status of species, and all have primarily been concerned with the national rather than global conservation status. These national Red Data Books are, however, very important because they are approved by special decrees of the respective governments and form the legal basis for the development of protection measures at the country level (Bykova and Hilton-Taylor, undated, viewed at redlist.freenet.uz/rl/rlregion_e.html, June 2003).

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ANNEX

Questionnaire on wild Snow Leopard populations, issued to 56 scientists, conservationists and government personnel, April 2002

Respondent's details

Name: Institution: Address: Fax:
Phone: Email: Date:

Range/country of expertise:

A) Legal status

(Where possible please provide details on the relevant legislation such as title of the law, year of entry into force, etc, and, where possible, bring copies of the relevant legislation with you to the Seattle meeting.)

1) Is the Snow Leopard listed in your national Red Book or considered a protected species in your country ?

Yes No Don't know

2) Is hunting, possession, sale and/or purchase of Snow Leopards or their parts prohibited by law in your country? If so, under which laws and/or regulations is the Snow Leopard protected?

Hunting is prohibited by law?	Yes / No.	If yes, which law?
Possession is prohibited by law?	Yes / No.	If yes, which law?
Sale is prohibited by law?	Yes / No.	If yes, which law?
Purchase is prohibited by law?	Yes / No.	If yes, which law?

3) Who is the authority responsible for the implementation and enforcement of these regulations?
(Please provide full name and address if possible)

Authority: Head: Address:

Are regulations being effectively enforced? Is there room for improvement?

4) What kind of fines or penalties can be imposed for violations of relevant laws ? *(Please state under which law, if possible).*

For illegal hunting?	Maximum fine:	Under which law?
For illegal possession?	Maximum fine:	Under which law?
For illegal sale?	Maximum fine:	Under which law?
For illegal purchase?	Maximum fine:	Under which law?

5) Has there ever been a fine imposed for violating laws on hunting, possession, purchase, offering for sale or sale of Snow Leopards? *If yes, please provide details on the individual cases providing as much information as possible, but most importantly: country, year (months), type of violation, action*

taken/fine imposed, source of information, possible source/contact person for further information if needed.

Example:

Country:

Year/Months:

Type of violation:

Fine imposed:

Source of information:

Contact person for further details:

(Please use more space where needed)

B) Killing of Snow Leopards

6) Have there been incidences of direct killings of Snow Leopards in your country?

Yes

No

Don't know

If yes, please rank by importance the most common reason for direct killings of Snow Leopards in your country: (Insert 1 for most important, 2 for next-most important, 6 for least important)

- Killing in retribution for livestock depredation
- Killing because considered general threat or competitor for wild ungulates (argali, ibex, etc.)
- Accidental killing (e.g. in a trap intended to catch other animals, e.g. wolves or other carnivores)
- Incidental killing (i.e. person just came across a Snow Leopard and took the opportunity to kill the animal, but wasn't planning to do so);
- Planned killing (i.e. placing trap in a Snow Leopard territory, etc.) with the incentive to market the animal or parts of the animal (if parts, please specify which parts)
- Others

Please explain your ranking and provide examples where possible:

7) What is the most common method used by poachers to catch/kill Snow Leopards?

Shot with gun

Trap

Using Poison

Other

8) In case of planned poaching of a Snow Leopard, what parts are most often taken by the poacher?

a) Skin

b) Dead animal

c) Live animal

d) Bones/skeleton

e) Others.....

9) In case a Snow Leopard is killed in retribution for livestock depredation, are its parts taken to sell?

a) No, dead body just discarded or ignored

b) Yes, skin is taken

c) Yes, bones taken

d) Yes, skin and bones taken

e) Other.....

10) Has the level of poaching changed over the last decade? Are more (or fewer) Snow Leopards being killed for the purpose of selling them?

- a) Fewer Snow Leopards caught/killed
- b) More Snow Leopards caught/killed
- c) No changes
- d) Don't know

Please explain your response briefly.

11) In your opinion, has there been a change in the motivation of people to kill Snow Leopards over the past decade? *Please explain your response and provide examples where possible.*

12) What prices are paid for live Snow Leopards or Snow Leopard parts (in local currency or USD)?

At local level (from poacher to trader)

Live animal:

Skin:

Skeleton/bones:

Others:

End prices (final buyer)

Live animal:

Skin:

Skeleton/bones:

Others:

Please explain your source of the information (first hand, hearsay etc.) and provide references where possible.

13) Have prices changed in recent years?

- a) Lower prices in the early 1990 were:
- b) Higher prices in the early 1990 were:
- c) No changes
- d) Don't know

14) Who are the potential buyers of Snow Leopard products? Are these mainly local people or are most Snow Leopard pelts or other products sold and transported outside their country of origin?

Mainly local people

Mainly traded outside the country

15) If most pelts or parts are sold outside the country, where are the parts traded to (cities, region, countries)?

16) Is this trade in pelts or other parts well-organized, or not really structured?

17) Have Snow Leopards or their parts been offered in public, for example through advertisement in local newspapers or offered at local markets? *If yes, please provide examples.*

18) Do you have any other comments, or any particular suggestions for discussion at the trade session at the Seattle meeting?

Thanks you very much for completing this questionnaire.

TRAFFIC, the wildlife trade monitoring network, works to ensure that trade in wild plants and animals is not a threat to the conservation of nature. It has offices covering most parts of the world and works in close co-operation with the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

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