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REPORT SUPPORTING CONCERTED AND COOPERATIVE ACTIONS UNDER CMS TO CONSERVE THE SNOW LEOPARD (*Uncia uncia*)

(Prepared by the Secretariat)

Background

1. The attached report was submitted to the CMS Secretariat for distribution to provide the basis for the CMS Scientific Council to make appropriate recommendations to the seventh meeting of the Conference of the Parties with regard to concerted and cooperative actions to conserve the Snow leopard (*Uncia uncia*).

2. The First Deputy Minister in the Ministry of Nature Protection of Tajikistan, on behalf of Tajikistan's Scientific Councilor, has submitted the report. Tajikistan is a Range State of the Snow leopard. Expressions of support from Scientific Councilors/Parties are welcome before and during the 11th meeting of the Scientific Council.

3. The report is attached to this note in the form and language in which it was submitted to the CMS Secretariat. A summary accompanying the report has been reproduced below. The Secretariat has undertaken minor editing for both of these documents.

Report Summary

4. This report provides the basis for a recommendation by the 11th Meeting of the CMS Scientific Council for the initiation of concerted and co-operative actions under CMS to conserve the snow leopard. Specifically, the Scientific Council is invited to consider a recommendation that the Conference of Parties:

- Resolve the initiation of a concerted action for snow leopard;
- Request the Secretariat to contact the Range States to determine the desirability of concluding an Agreement under CMS auspices; and
- Make funds available to develop an Agreement if the response is favourable.

5. The range of the snow leopard is restricted to the high mountains of Central Asia and it occurs in 12 countries including Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Nepal, Mongolia, Pakistan, Russia, Tajikistan and Uzbekistan. Total potential habitat is approximately 1,230,000 km2. It is estimated that no more than 3,500 to 7,000 cats remain in the wild. Although protected throughout its range, the threats to snow leopards are many and immediate. In some states dramatic losses have recently occurred, and snow leopard populations may be half of 1990 levels.

6. Snow leopards are strongly associated with alpine tundra, making them particularly vulnerable to habitat changes which comes primarily from overgrazing of domestic livestock. Natural prey, wild mountain sheep and goats, are in decline across much of the region due to poaching for meat and to poorly regulated trophy hunting. As prey decline, snow leopards make more use of domestic livestock with resultant retribution killing by herders.

7. The illegal internal and cross-boarder trade in live specimens, hides, bones and other body parts maybe the major threat to snow leopard survival. Pelts are highly sought after for fashion goods and recently bones have increased in value on the Traditional Chinese Medicinal Market. No comprehensive assessment of snow leopard trade has been undertaken on a regional or global scale.

8. Snow leopards are very poorly understood because they are extremely secretive, and because political borders frequently run along mountain ranges where access is generally restricted. Hence, information necessary to design effective conservation measures is often lacking.

9. Mongolia and Pakistan are the only CMS states to have undertaken a comprehensive management plan for the species, and the Mongolian plan lacks official government recognition at this time.

10. Snow leopard populations extend over multiple countries and conservation will require a coordinated approach with particular attention paid to transboundary cooperation. To ensure that measures taken by one range state do not work in opposition to those taken in another, it is critical that cooperative agreements, such as a CMS agreement, be in place prior to action planning.

11. For the above reasons, it is urgent that the CMS Scientific Council recommend the initiation of concerted and co-operative actions, or risk the loss of this magnificent species.

Report to the 11th Meeting of the CMS Scientific Council

in support of Concerted and Co-operative Actions Under CMS to Conserve the

Snow Leopard (*Uncia uncia*) (CMS Appendix I)

Submitted on behalf of the Scientific Councillor for Tajikistan by the First Deputy Minister,

Ministry of Nature Protection, Tajikistan

Developed in cooperation with the international Snow Leopard Network

This report has been produced to provide the basis for a recommendation by the 11th Meeting of the CMS Scientific Council for the initiation of concerted and co-operative actions under CMS to conserve the snow leopard (*Uncia uncia*) which is currently listed on CMS Appendix I. It is a product of joint work between the sponsor and members of the international Snow Leopard Network (SLN), a network of more than 50 snow leopard experts from 17 countries concerned with snow leopard conservation.

The Scientific Council may wish to consider a recommendation that the Conference of Parties:

Resolve the initiation of a concerted action for snow leopard; and

Request the Secretariat to contact the Range States to determine the desirability of concluding an Agreement under CMS auspices, while making funds available to develop an Agreement if the response is favourable.

1. Taxonomy

1.1. Specific taxonomy

The snow leopard (*Uncia uncia*) is a member of the Felidae subfamily Pantherinae (Blomqvist 1978, Nowak and Paradiso 1983). On the basis of morphology and behavior it is placed alone in a separate genus (Pocock 1917, Peters 1980, Rieger 1980b, Hemmer 1967, 1972, Anonymous 1987c).

1.2. Common name (s)

Snow leopard, Ounce (English); Schneeleopard, Irbis (German); leopard des neiges, once (French); bharal he, barfani chita (Hindi, Urdu: India, Pakistan); shan (Ladakhi: India); Ikar (Pakistan); irbis, irvis (Russia, Central Asian republics, Mongolia); snezhnai bars (Russian).

2. Biological data

2.1 Distribution (current and historical)

The historical range of the snow leopard is restricted to the mountains of Central Asia, with core areas in the Altay, Tien Shan, Kun Lun, Pamir, Hindu Kush, Karakoram, and Himalaya ranges. Its north to south distribution occurs within the countries of the Soviet Union, Mongolia, China, Afghanistan, Pakistan, India, Nepal, and Bhutan. Early reports of snow leopards from as far west as Asia Minor and as far east as Sakhalin Island are apparently incorrect (Rieger 1980c). The total area of potential habitat within the region is approximately 1,230,000 km^2.

2.2. Habitat

Snow leopards are closely associated with the alpine and sub-alpine ecological zones, preferring broken, rocky terrain with vegetation that is dominated by shrubs or grasses. In the Sayan Mountains of Russia and parts of the Tien Shan Range, they are found in open coniferous forest, but they usually avoid dense forest. They generally occur between elevations of 3,000 to 4,500 m, except within their northern range limit where they are found at lower elevations (900 to 2,500 m). Reports suggest that they migrate to lower elevations during winter in northern Pakistan, the Tien Shan Mountains, ranges in Russia, and parts of India, following movements of their primary prey species such as ibex and markhor. Snow leopards prefer steep terrain broken by cliffs, ridges, gullies, and rocky outcrops, although they may traverse relatively gentle country, especially if ridges offer suitable travel routes and shrubs or rock outcrops provide sufficient cover. They show a strong preference for irregular slopes in excess of 40° and well-defined landform edges, such as ridgelines, bluffs and ravines, along which to travel about their home range.

2.3 Population estimates and trends of all range states (in alphabetical order)

There are no reliable estimates for the total snow leopard population. Numbers are presently placed at 3,350 to 7,000 in the wild (Fox 1994; Nowell and Jackson 1996).

Afghanistan - No population estimate is available (Sayer 1980).

Bhutan – No population estimate is available.

China – Population of about 1,400 (Fox 1989a), but this data excludes Sichuan and the potentially significant populations of Tibet. Estimates for Tibet and Sichuan Province are not presently available. Thus, the total Chinese population is more likely on the order of 2,000 to 2,500 animals. A recent survey indicates the species is likely on the brink of extinction in Inner Mongolia (G.B. Schaller, personal communication to Tom Mc Carthy).

Kazakhstan – Annenkov (1990) reported about 65 to 70 snow leopards in a 8,200 km^2 area, giving a mean density of 0.83 individuals per 100 km^2.

Kyrgyzstan – Koshkarev (1989) mapped snow leopard occurrence over much of its range in Kyrgyzstan, recording 20 inhabited areas (totaling 6,554 km^2), with an estimated population of 113 to 157 animals. Estimated density ranged between 0.8 and 4.7 animals per 100 km^2, averaging 2.4 animals. With nearly 66,000 km^2 of potential habitat in the country, a conservative estimate of 660 snow leopards (1 per km^2) were likely present in 1990. Due to the high level of poaching in the course of the 1990s the population has most likely decreased significantly but no reliable population estimate is available at present (Dexel 1999).

India – Fox et al. (1991) estimate that about 400 snow leopards reside within a 52,000 km^2 area of northwestern India, with a nation-wide population of some 500 animals. This figure is derived using a mean density of one snow leopard per 110 km^2 in good habitat along the southern slopes of the Himalaya (22,000 km^2). Small patches of prime habitat may support as many as one snow leopard per 15 km^2.

Mongolia – The population is estimated at about 1,000 (Schaller et al. 1995, McCarthy 2000) in an occupied range of about 103,000 km^2.

Nepal – The population was estimated at 150 to 300 (Jackson 1979), an estimate recently increased to 350 to 500, based on computer modeling using a map-derived Habitat Suitability Index System (Jackson and Ahlborn 1990). Jackson and Ahlborn (1989) reported densities of 5 to 10 snow leopards per 100 km^2 in the remote Langu Valley of west Nepal, slightly higher than estimated densities for Nar-Phu located north of Annapurna (M. Oli, personal communication to Tom Mc Carthy).

Pakistan – The population is less than 250 animals according to Schaller (1976). Assuming a mean density of one snow leopard per 250 km^2, the total population for Pakistan would be no more than 300.

Russia – Snow leopards are being reported from the Altay and Sayan ranges bordering the People's Republic of Mongolia. Smirnov et al. (1990) estimates about 80 snow leopards reside in southern Siberia, including those animals that wander into Mongolian territory. The southern Siberian snow leopards are isolated from those of Central Asia. Sopin (1977, cited in Fox [1989b]) estimates mean densities at 0.75 to 1.5 snow leopards per 100 km^2 in parts of the Altai Mountains, for a total population of about 40.

Tajikistan – Sokov (1990) estimates the number at about 200 to 300, significantly higher than previous estimates.

Uzbekistan – The status of the snow leopard population is poorly known although recent estimates range from 30 – 35 animals in an area of 7,350 km^2 (Kreuzberg-Mukhina et al. 2002). Snow leopards are reported from the Turkestanskiy, Chatkalskiy, and Gissarskiy ranges bordering Tajikistan and Kyrgyzstan.

2.4 Migration patterns

Snow leopards are subject to annual elevational movements in response to snowfall and the seasonal movements of their large prey species. They spend summers in high alpine pastures, moving to lower altitudes in winter. As a mountain species, snow leopard habitat tends to be linear with substantial edge and thus more subject to fragmentation. Except for the population occupying the Tibetan Plateau, nearly all snow leopard populations are concentrated along the mountain ranges that constitute the **international boundaries** between the 12 range

countries: the Himalaya in the south (Bhutan, India, Nepal, and China); the Hindu-Kush/Karakorum Range of Pakistan, Afghanistan, Tajikistan and China, the Tien Shan Range of the Commonwealth of Independent States (CIS) and China, and the Alatai between Mongolia, Russia, Kazakhtsan and China, for example. In terms of area, the **transboundary** zone encompasses some 30-40% of the snow leopard's total potential range of 1.2 million square kilometers. China alone constitutes 60% of the snow leopard's total habitat and shares a border with 11 other range states.

3. Conservation status by Party

3.1 India

Chundawat et al (1988) estimated potential habitat for snow leopard in India at 95,000 km^2, of which 72,000 km^2 is located within Ladakh (a figure which includes about 20,000 km^2 within the disputed area between Pakistan and China). Mallon's (1984) report of only 100 - 300 snow leopards in Ladakh is certainly too low. Fox et al. (1991) reported that there were about 400 cats in NW India within the 72,000 km^2 area. These authors placed India's total snow leopard number at about 500, derived by extrapolating from an average density of one animal per 110 km^2 for good habitat along the north slopes of the Himalaya (an area of 30,000 km^2) and one per 190 km^2 for lower quality habitat along the southern slopes of Himalaya (area of 22,000 km^2). Hunter and Jackson estimated the amount of potential habitat in India at 89,271 km^2 of which about 14.4% under protected area status.

There are at least 18 and possibly as many as 34 existing and proposed protected areas which could harbor snow leopard (Rodgers and Panwar 1988; Government of India 1988; Fox et al. 1991; Green 1992; Green 1993; Singh et al. 1990; ISLT, unpub. data). Bhatnagar et al (2001) listed 25 protected areas, totaling 7.6% of the biogeographic zone supporting the species.

3.2 Mongolia

McCarthy (2000) estimated total range at 103,000 km^2, a figure similar to the Mallon's (1984) estimate of 130,000 km^2, and the Schaller et al. (1994) estimate of 90,000 km^2 -- but substantially different from Hunter and Jackson's figure 277,836 km^2.. However, the latter is based on GIS modeling rather than field observation or interviews of local residents. The main populations are said to occur in the Altay and Trans-altai Gobi mountain ranges, with smaller populations in the Khangai, Hanhohiy Uul and Harkhyra Uul ranges. Koskharev (1998) reported sightings made along sections of the Mongolia - Russian border. Schaller et al. (1994) placed the eastern-most range extent at about 103 degrees longitude.

Thornback and Holloway (1976) placed Monglia's total population at less than 300, which is certainly too low a number. Bold and Dorzhzunduy (1976) estimated a total snow leopard population of 500-900. They judged there were 190-250 snow leopards in a 6,600 km^2 area in the South Gobi Province, and a calculated density of 4.4/100 km^2 in a 1,000 km^2 area encompassing the Tost Uul Range. McCarthy (2000b) used extensive field surveys to derive a detailed range map that highlighted the very fragmented distributional pattern and placed the total at about 1,000 snow leopards. Schaller et al. (1994) found sign of at least 10 cats within a 200 km^2 area of the Burhan Budai of the Altay, a density substantially above that existing elsewhere .

3.3 Pakistan

Fox (1994) estimated snow leopard range in Pakistan at 80,000 km^2, while Schaller (1976) placed the total number at 100-250. Schaller searched a 300 km^2 area in Chitral known for snow leopard, but found evidence of only four or possibly five. Density estimates are lacking, but assuming a mean density of 1/250 km^2, the total population for Pakistan would be no more than about 320 snow leopards. Snow leopards occur in the Hindu Kush range in the Northwest Frontier Province's Chitral District, and in the Karakorum Range of the Northern Areas in the Gilgit, Hunza and Baltistan districts. A good population of snow leopard is reported from the Shimshal area in Hunza, but no density estimate is available (Wegge 1988). Its presence in Azad Kashmir Province remains unconfirmed (Roberts 1977). Malik (1997) described key threats to the species.

Hunter and Jackson (1997) estimated potential habitat at 81,016 km^2, of which some 6.6% is under protected status. Green (1988) reports the total amount of protected area supporting snow leopard is 3,190 km^2, but this figure has been greatly increased with the establishment of Conservancies under a United Nations Development Programme sponsored project. In addition, The Mountain Areas Conservancy Project (MACP) of UNDP/IUCN has delineated four areas or Conservancies totaling 16,300 square km, where community-based biodiversity conservation initiatives are currently being undertaken (MACP 2001). All of these areas likely support snow leopards. Two, the Nanga Parbat and Gojal Conservancies, are located in the Northern Areas, with the other two (Tirichmir and Qashqar

Conservancies) in the North-West Frontier Province With the exception of the Khunjerab National Park and the recently established Conservancy areas, these PAs are too small to protect more than a very few cats, whose likely wander well beyond the protected area boundary.

3.4 Tajikistan

Little is known about the current status and distribution of snow leopard in this Republic. Sokov (1990) estimated numbers at 200 - 300, significantly higher than a later estimate by Bururukov and Muratov (1994) who placed the total at 80-100 snow leopards. These authors attributed the decrease to a decline in the number ibex, the snow leopards primary large ungulate prey species across the Pamir and into the Tien Shan.

Snow leopards are said to occur in the central and western parts in the Zeravshanskiy, Gissarskiy, Karateginskiy, and Petr Pervyi mountains, and in the Hazratishog and Darvaskiy Mountains, and in the Gorno-Badahshansk area, including the Pamirs. Hunter and Jackson estimated potential habitat at 78,440 km2, with about 13.3% under protected area status (a figure which assumes the Great Pamir NP is a functional entity since it was declared in 1992).

Snow leopard are present in two of the three protected areas: Six animals were reported from the 161 km² Ramit State Reserve and the 197 km² Dashti-Dzhumskiy Reserve (Sokov 1990). Also reported from the 300 km² Iskanderskul'skiy lake reserve (but there is little habitat), the 680 km2 Muzkul'skiy, 5,006 km² Pamisskiy, and the 510 km² Sangvorskiy Zakazniki reserves.

During an aerial survey of Marco-Polo Sheep in 1991, 9 snow leopards were registered in the Pamirs. (Personal communication K. Kasirov to Birga Dexel, September 2001).

3.5 Uzbekistan

This range country stands at the far western edge of the snow leopard's range. They are reported from the Turkestanskiy, Chatkalskiy and Gissarskiy ranges bordering Tajikistan and Kyrgystan (Braden 1982), with the total population estimated at about 50 animals (Sludskiy 1973, cited in Braden 1982). More current estimates are not available. Hunter and Jackson estimated potential habitat in Uzbekistan at 13,834 km², of which about 5.8% is under protected area status. Snow leopards are reported from the 106 km² Zaaminskiy State Reserve and the 324 km2 Uzbek National Park, as well as the 875 km² Gissarskiy State Reserve, which was formed by the Kyzylsuiskiy and Mirakinskiy reserves. The Chatkal'skiy State Reserve, consisting of two areas 111 and 242 km² in size, and separated by 20 km, also harbors snow leopards (ISLT, unpub. data).

4. Actual and Potential threats

4.1. Habitat degradation, fragmentation and loss

While snow leopards make marginal use of several habitat types, the species is most strongly associated with high alpine tundra, which itself constitutes a very fragile ecosystem. This narrow habitat use makes snow leopards particularly vulnerable to habitat changes. Alteration of habitat over much of snow leopard range does not fit what may be the common image of habitat degradation and fragmentation. Large scale resource extraction, road building, and urbanization occurs within snow leopard range, yet is relatively rare due to remoteness and inaccessibility. Perhaps the most commonly observed form of habitat alteration within snow leopard range is more subtle, yet still potentially destructive, and comes in the form of livestock grazing and disturbance by their human owners.

4.2 Exploitation: direct and incidental

4.2.1 Trade

The illegal internal and cross-boarder trade in live specimens, parts and derivatives is one of, and in some regions of Central Asia, the major threat to the survival of the species. The trade in snow leopards used to concentrate on pelts and live specimens. The latter supplied the zoo and private collector trade but live cats were also given away as presents during state visits. Even though the trade in live animals continues on a small scale in Kyrgyzstan, this trade segment no longer poses the most significant threat (Dexel 2002). The trade in pelts and bones is undertaken on a far greater scale. Pelts are being used to make fur coats, hats and other clothing items but are also traditionally used in Kazakhstan, Kyrgyzstan, Mongolia and the Xingjian Province in China as decorative wall mountings. In the last decade, however, bones are also being traded presumably as substitutes for Tiger bones to supply the Traditional Chinese Medicinal Market. No comprehensive impact assessment of all snow leopard trade segments has ever been undertaken on a regional or global scale. Information is lacking in regard to the national and global scale of trade, the

consumer markets, trade dynamics and trends.

4.2.2 Killing of snow leopards in retribution for livestock depredation

Snow leopards use domestic livestock as a food resource in nearly all areas where they overlap, with resultant retribution killing by herders. Given the reliance on livestock for food, clothing, and trade goods by poor grazier families, retribution killing may be easily understood. Yet predation on domestic livestock is a complex situation. Greatest losses occur where native prey species (ibex, blue sheep, argali, and marmot) have been greatly reduced, but are also most serious where herders employ poor guarding practices. Conservation actions must take into consideration all aspects of the issue.

4.3. Other threats

4.3.1 Reduction of natural prey due to illegal hunting

Mountain ungulates are illegally hunted for meat and for trophies by local residents. Wild game meat can be highly prized for its medicinal value, or can be a traditional food for honored guests or special holidays. In some cases illegal hunting may constitute a commercial activity. There is rarely any provision for legal hunting by local people, which disenfranchises them and makes compliance with laws minimal. The illegal harvest likely far exceeds the legal harvest in many areas, with resultant declines in snow leopard food resources.

4.3.2 Reduction of natural prey due to competition with livestock

Competition between livestock and wild mountain ungulates may result in declines of wild stock, thus reducing the natural forage base for snow leopards. The potential consequences of prey reduction are two-fold; direct losses of snow leopards as carry capacity diminishes, and increased use of domestic livestock by snow leopards which increase retribution killing by graziers.

4.3.3 Reduction of natural prey due to legal hunting

In many snow leopard range-states trophy hunting for wild sheep and goats is a lucrative business and brings in substantial income to government, hunting organizations and both private and state hunting reserves. In some cases these hunts are not well managed and harvest levels are clearly above sustained yield. A conflict of interest can exist when the management agency receives a large portion of its income from foreign trophy hunting. Wild ungulate stocks are in decline in many areas, reducing carry capacity for snow leopards and other carnivores.

4.3.4 Reducing of natural prey due to disease

A poorly understood situation is known to exist in some parts of snow leopard range where ungulate numbers are in decline and the apparent cause is disease. The types of diseases responsible and what role humans or livestock may be playing a role as vector is yet unclear.

5. Legislation

5.1. International

5.1.1. IUCN Red List

Snow leopards are listed as Endangered in that they do not meet the criteria of Critically Endangered but are projected to decline by 50% or more over next 3 generations due to potential levels of exploitation (trade in pelts/bones and conflict with livestock), and due to declining: 1) area of occupancy, 2) extent of occurrence, and 3) quality of habitat (prey depletion).

Snow leopards are covered by all relevant international conventions addressing different aspects of their conservation. The five snow leopard range states party to the CMS are also parties to CITES and the CBD.

5.1.2 Convention on Migratory Species (CMS)

The snow leopard was listed in Appendix I in 1985, indicating there is reliable evidence, including the best scientific evidence available, that the species is "Endangered" and in danger of extinction throughout all or a significant portion of its range. States that are party to the Convention must (1) conserve and restore its habitats; (2) prevent, remove, compensate or minimize adverse effects of activities or obstacles that seriously impede their migration, and (3) prevent, reduce or control factors that are endangering or are likely to further endanger the species.

5.1.3 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The snow leopard was listed on CITES Appendix I in 1975 thereby prohibiting the international commercial trade in live specimens, parts and derivatives. CITES does not affect national trade and no further actions have been taken in the framework of the Convention. Many range countries did not become Parties to CITES till the late 1990s.

5.1.4 Convention on Biological Diversity (CBD)

Snow leopard conservation issues and remedial actions have been formulated in National Biodiversity Strategies and Action Plans of range states.

5.2 National

The species is fully protected in every range state under the respective national laws and hunting is prohibited. However, range states have difficulties in enforcing these provisions.

6. Conservation measures by Party

6.1 Action Plans

6.1.1 Mongolia

The Mongolian Snow Leopard Conservation Plan was developed in 1999 after consultation with stakeholders and in cooperation with agencies of the Mongolian government (Ministry for Nature and Environment, Endangered Species Commission, Nature Conservation Agency, and Academy of Sciences). Although accepted and signed by all cooperators, it is not recognized as official policy by the present government of Mongolia.

6.1.2 Pakistan

Government agencies, conservation NGOs, and other stakeholder met in spring 2001 to develop a Strategic Plan for the Conservation of snow leopards in Pakistan. The planning process was led by WWF-Pakistan. The Strategic Plan is to serve as a guiding tool for agencies and organizations participating in the conservation of snow leopards. The objectives of the plan include; providing information on major conservation issues of snow leopard in Pakistan, providing guidelines on resolving controversial issues in relation to the conservation of snow leopard, providing a strategic framework for the collection and use of information in the conservation of snow leopard on long term basis, and providing a basis for close collaboration between range-states in the conservation of snow leopard. It is expected to gain full acceptance as an official policy of the Pakistan government in 2002. The National Council for the Conservation of Wildlife is serving as the focal point of that effort.

6.1.3 Non-party States

Russia (non-party participant in CMS agreements)

A strategy for conservation of the snow leopard in the Russian Federation was recently developed by a working group which included representatives of the Ministry of Natural Resources of the Russian Federation, representatives of state and environmental authorities of the republics Altai, Khakasia, Tyva, Krasnoyarsk region, the Commission on Large Carnivores of the Theriological Society of the Russian Academy of Sciences, and WWF Russia. The Strategy was approved by the Ministry of Natural Resources of the Russian Federation in December 2001. WWF-Russia was the focal point for this effort.

Of the remaining snow leopard range states, only Nepal has embarked on an action plan for the species. That plan is in the developmental stage and is being carried out by WWF-Nepal.

6.1.5 Snow Leopard Survival Strategy

A blue-print for the long-term survival of the snow leopard was recently developed by a consortium of 55 experts, including representatives from each CMS snow leopard range state. The 16-month highly participatory process drew on the expertise of conservationists, researchers, educators, government policy-makers, and resource managers from across snow leopard range and around the world. The Strategy document, now being finalized, identifies threats to snow leopards on a regional basis, looks at information needs, lays out clear conservation, policy and education activities needed to mitigate threats, and serves as a guideline for development of Country Action Plans.

6.2 Conservation and Restoration of Habitat

Habitat degradation is considered a serious issue for snow leopard conservation and the primary agent is over-grazing by domestic livestock. In several of the former Soviet Republics, livestock numbers have actually gone down substantially over the past decade, while in most of the rest of snow leopard range levels are increasing. Given that livestock husbandry is the principle livelihood of many rural people in snow leopard habitat, it is very difficult to implement programs to reduce livestock density, especially to protect a predator that already has a negative impact on their well-being. Hence, few if any countries have attempted to address this conservation issue. Roads, mining, and pipelines are other habitat degradation issues, but they that have been poorly researched or documented, mush less mitigated.

6.3 Mitigation of impediments to migration

Physical barriers due to border fences are few. Due to inaccessible terrain and the difficulty of patrolling, the primary threats within transboundary zones are thought to be; 1) extensive poaching or unregulated hunting of ungulate prey species, and 2) poaching of snow leopards for their valuable pelt and bones. It is unclear what impact military out-posts or patrols currently have on wildlife in border areas. However, anecdotal information suggests that killing for food and sport by military personal is not uncommon and goes undocumented due to the fact the border zones are usually restricted access area. International cooperation and collaboration between range states offers the best means for addressing these threats and ensuring that snow leopard and prey species can make free use of the international border zone between the range countries.

6.3 Regulation of other detrimental forces

6.4 Further measures

7. Research activities

Extensive knowledge gaps exist for snow leopards in part because they are one of the most elusive and secretive of the large cats, but also because much of their habitat has been off-limits to scientists. Political borders in the region frequently run along mountain ranges, the prime habitat of the cats, and access is often restricted. As a result, the snow leopard is poorly understood and information necessary to design effective conservation measures is often lacking.

7.1 Governmental

There are no research programs on snow leopards currently being undertaken by any CMS or non-party snow leopard range-state government. Some government agencies may be involved in limited monitoring of snow leopard population trends as part of protected area management.

7.2 Non-governmental

The most recent large-scale scientific study of snow leopards was conducted in Mongolia between 1992-1998. This program was primarily supported by the Wildlife Conservation Society (New York, USA) and was conducted in cooperation with the Mongolian Association for Conservation of Nature and Environment (MACNE) and the Great Gobi National Park.

Several CMS Parties and NGOs have cooperative agreements or MoUs with the International Snow Leopard Trust (ISLT, Seattle, USA) to conduct snow leopard population monitoring through the Snow Leopard Information Management System (SLIMS). SLIMS is a standardized set of field methods for assessing populations of snow leopard and their prey, and includes data management and information sharing between states. Biologists and resource managers from CMS states including India, Pakistan, Mongolia, and Uzbekistan have been trained in and

use the SLIMS techniques. The information sharing aspect of the SLIMS program is currently being updated and improved.

8. Needs and recommended actions

Snow leopard habitat is commonly found in border regions, where mountain chains make up the boundary between states. Hence, many snow leopard populations extend over multiple countries and conservation of the species will require a coordinated approach with particular attention paid to **transboundary** cooperation. A comprehensive list of potential actions is provided below and divided into legislative, conservation, and research needs. To ensure that measures taken by one range state do not work in opposition to those taken in another, it is **critical** that cooperative agreements, such as a **CMS agreement**, be in place prior to action planning.

Not all actions listed below would be appropriate or useful in each country, or even across any one country. Further discussion at all stakeholder levels, from grass-roots to policy-makers, will be required to formulate national action plans or to specify actions to be used on local scales.

8.1 Legislative needs

- *International Cooperation* - Establish an international legal framework, such as a **CMS Agreement,** to anchor conservation activities, including the regional Snow Leopard Survival Strategy.
- *Snow Leopard in law* – Ensure that within each range state the snow leopard is fully protected under the law and that sale, purchase, and trade of all snow leopard parts is illegal, and clear penalties apply for violation. Regional harmonization of laws would best be accomplished through cooperative agreements between range states.
- *CITES* - Reduce the market for wildlife parts by joining and/or enforcing international conventions on wildlife trade. May necessitate establishing anti-poaching teams particularly in border areas, with **transboundary** cooperative capability.
- *National hunting laws* – Develop, pass, and enforce new or better hunting laws with clear penalties for violations. May also entail raising public awareness and acceptance of laws.
- *"Whistle-blower" laws* – Include provisions in national environmental laws that reward citizens who provide information about poaching, while assuring confidentiality.
- *Harvest Monitoring* – Institute monitoring program for legal ungulate harvest to gain data on harvest level, sex/age, hunting effort, herd health etc.
- *Environmental Impact Law* – Establish and/or enforce laws requiring environmental impacts assessment prior to any development project which may negatively impact natural resources. Law must provide for open public involvement and review.
- *Grazing limitations* – Establish grazing permit systems in Protected Area buffer zones and other critical wildlife habitat to control use, with community management participation.
- *Depredating cat removal* – Establish clear government guidelines stating under what conditions depredating snow leopards can be removed, and by whom.

8.2 Conservation measures

Necessary and Appropriate Conservation Actions include:

- *Protected Area System* -- Improve the effectiveness of protected area systems, particularly **transboundary** sites. May include protected area augmentation, enhancement of staff capabilities, and inclusion of local people in management.
- *Grazing management* – Promote grazing practices that reduce impacts on native wildlife including rotational grazing, set-asides, and grazing limits in wildlife birthing areas
- *Wildlife based ecotourism* -- Establish wildlife-based tourism that provides jobs and economic benefits to local people to foster protection of wildlife and habitat.
- *Cottage Industry* -- Create income generation programs (handicrafts, etc.) in snow leopard habitat with direct and obvious linkages to conservation of wildlife and habitat.
- *Trophy Hunting Programs* – Establish hunting programs that are sustainable, well monitored, and provide return to local people as an incentive to protect ungulates
- *Mass-media anti-poaching campaigns* -- Raise awareness among a broad audience, national and international, of impact and consequences of illegal wildlife harvest.
- *Reduce losses of livestock to snow leopards* – Encourage livestock husbandry practices that reduce depredation by snow leopards and other predators
- *Livestock insurance* -- Establish livestock insurance programs with herder-paid premiums. May be supplemented by income from tourism, cottage industry, etc.

- *Local wildlife use* – Provide ungulate hunting opportunities for nationals to instill resource "ownership". If only foreigners can hunt, conservation interest falters.
- *Veterinary treatment* – Treat livestock for infectious disease in areas where they overlap with wild ungulates.
- *Conservation Awareness (public)* -- Implement educational programs that raise local public awareness of wildlife values and threats. May include curriculum for schools.
- *Conservation Awareness (government)* – Initiate detailed conservation awareness programs for lawmakers, other government officials, and resource managers.
- *Legal Awareness* - Raise public awareness of environmental laws and penalties.
- *Animal Husbandry* – Provide animal husbandry training to improve monetary return at lower stock levels, and limit exposure to predation by snow leopards.

8.3 Research and monitoring

An improved understanding of snow leopard distribution and identifying 'hotspots' is an important conservation need across their range. This reiterates the poor conservation attention that the snow leopard has received globally – over most of the range, we do not even know where the species occurs. This emphasizes the need for snow leopard surveys and distribution mapping, the results of which will help identify areas for conservation. This activity will be much enhanced with **transboundary** cooperation for surveys in border areas. The other equally important need at the global level is estimating snow leopard population size and monitoring population trends. Population estimation techniques for carnivores are poorly developed. Although the tiger has received some attention recently in this regard, there has been no progress in the last two decades in snow leopard population estimation techniques. Considering the globally felt need for estimating snow leopard population and monitoring trends, urgent methodological research and advancement are needed, and this will perhaps be best achieved through collaborations with other carnivore biologists, especially tiger researchers.

The need to document and understanding the extent of snow leopard poaching is a high priority across the range, except in the Himalaya where poaching for skin and bones is a less serious threat. Closely tied to this is the need for quantifying the illegal trade in wildlife parts. No scientific research or surveys can address this issue; this calls for sensitization of and co-operation with law enforcement agencies for better intelligence gathering and law enforcement.

Snow leopard habitat faces pervasive human presence and use of natural resources, and the survival of the snow leopard will ultimately be determined by attitudes of people who share its habitat. Hence, there is a strong need to understand human attitudes to snow leopards. This should be combined with socio-economic profiling of herder communities who share the habitat with the snow leopard. Field research projects must include socio-economic and anthropological aspects, in addition to ecology and natural history. Lastly, there is a need for better understanding of snow leopard prey populations – their distribution, population sizes, and trends in populations over time.

Thus, across the range, the important information needs for snow leopard conservation could be categorized as those of (a) development and implementation of snow leopard population estimation techniques, (b) a better understanding of poaching pressures, (c) evaluation of the attitudes and lifestyles of herder communities who share the snow leopard's habitat, and (d) better understanding of prey species distributions and populations.

A table of information needs prioritized by region is included as Annex A.

8.4 Other

9. Additional remarks

The urgency of the need to address threats to the survival of the snow leopard has been attested to by a broad range of specialists, organizations, and governments who were represented at the Snow Leopard Survival Summit in Seattle, May 2002. A declaration concerning the need for immediate action to stop poaching, killing and illegal trafficking of snow leopards for their fur and bones was signed by all participants and is being forwarded to all snow leopard range state governments.

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Annex A.

Prioritization of Research and Information Needs by Region
as determined by Snow Leopard Survival Strategy Specialist Group

Regions are broadly defined as:
HML - Himalaya: Tibet and other S. China, India, Nepal, Bhutan
KK/HK - Karakhorum and Hindu Kush Range of Afghanistan, Pakistan, China
CAS – Cent Asia: Uzbekistan, Tajikistan, Kyrgystan, Kazakhstan, Xinjiang, China
NRNG - Northern range: China Altai and Tien Shan, Mongolia, Russia
RW - Range-wide, needs as determined by international experts

Scores - 3 High, 2 Medium, 1 Low
Highest 10 needs in region
Second 10 needs in region
Lowest 10 needs in region

	Region				
Research or Information Needs	**HML**	**KK/HK**	**CAS**	**NRNG**	**RW**
Snow leopard distribution and "hot spots"	3.0	2.6	3.0	3.0	3.0
Snow leopard migration and dispersal routes	2.3	1.3	2.8	3.0	1.9
Snow leopard population size and trends	2.5	2.6	3.0	3.0	2.6
Snow Leopard population trends and factors responsible for changes	2.5	1.6	2.9	3.0	2.5
Protected Area coverage—extent and representation of habitats (gap analysis)	2.3	2.0	2.0	3.0	2.1
Agents of habitat degradation and relative impacts	2.3	1.6	2.1	3.0	1.5
Snow leopard –prey relationships	2.6	1.7	1.9	2.0	1.7
Prey species distribution and "hot spots"	2.4	2.9	2.5	3.0	2.0
n baseline and trends	2.4	2.9	2.5	3.0	2.3
Dynamics of illegal ungulate huntings (sources, local need, uses, trade, etc.)	1.5	1.7	2.8	2.0	2.5
Dynamics of legal ungulate harvest and statistics (sex/age, trophy size, etc.)	1.5	2.1	2.8	2.0	1.7
Wild ungulate—livestock interactions (competition)	2.7	2.0	1.3	1.0	1.9
Ungulate disease—type, areas of occurrence, prevalence, virulence, treatment	1.7	2.7	2.3	2.0	1.2
Snow Leopard poaching levels	1.9	2.9	3.0	3.0	2.9
Illegal trade in wildlife parts—market demand, sources and routes, value, etc.	1.9	2.9	2.9	2.0	2.6
Livestock depredation rates	2.1	2.7	1.6	2.0	2.0
Livestock depredation causes	2.1	2.7	1.1	2.0	2.0
Grazing pressure and range conditions	2.4	1.4	1.8	2.0	1.6
Snow leopard disease—type, areas of occurrence, prevalence, virulence	1.2	1.3	2.6	1.0	1.1
Snow leopard home range size and habitat use	2.0	2.6	2.5	2.6	1.8
Snow leopard social structure and behavior	1.8	1.3	2.6	3.0	1.7
Snow leopard population genetics	1.8	1.1	2.4	2.0	2.1
Snow leopard food habits	1.7	1.3	2.5	2.0	1.8
Snow Leopard relationships to other predators	1.8	2.0	2.8	2.0	1.6
Economic valuation of snow leopards	1.8	2.4	2.8	3.0	1.4
Snow Leopard monitoring techniques development	2.6	1.7	3.0	2.0	2.9
Socio-economic profiling of herder communities	2.4	2.6	2.0	2.0	2.4
Methods to alleviate impacts of war	1.6	1.3	2.0	1.0	1.3
Livestock and human population status and trends	2.4	1.1	2.3	2.0	1.9
Analysis of existing policies and laws	2.0	3.0	2.4	1.0	1.6
Human attitudes to snow leopards	2.5	2.8	1.9	3.0	2.2