



Snow Leopard Conservation Action Plan for Nepal

2005-2015
(Revised 2012)

Government of Nepal
Ministry of Forests and Soil Conservation
Department of National Parks and Wildlife Conservation



Core Team

Dr. Maheshwar Dhakal, DNPWC
Mr. Kamal Thapa, WWF-Nepal
Mr. Ananta Ram Bhandari, WWF-Nepal
Mr. Ram Chandra Nepal, NTNC

Reviewers

Dr. Eric Wikramanayake
Dr. Ghana Shyam Gurung
Mr. Krishna Prasad Acharya
Dr. Narendra Man Babu Pradhan
Dr. Rinjan Shrestha
Mr. Shyam Bajimaya
Mr. Dhan Prasad Rai

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Department of National Parks and Wildlife Conservation

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Acronyms

| | |
|---------|---|
| ACA | Annapurna Conservation Area |
| ANCA | Api-Nampa Conservation Area |
| BZMC | Buffer Zone Management Committee |
| CAMC | Conservation Area Management Council |
| CBAPO | Community-based Anti-Poaching Operation |
| CBO | Community Based Organizations |
| CFUG | Community Forest User Group |
| CLCU | Central Landscape Conservation Unit |
| CITES | Convention on International Trade in Endangered Species |
| DDC | District Development Committee |
| DDG | Deputy Director General |
| DFO | District Forest officer |
| DoF | Department of Forests |
| DG | Director General |
| DHR | Dhorpatan Hunting Reserve |
| DNPWC | Department of National Parks and Wildlife Conservation |
| FECOFUN | Federations of Community Forest Users Nepal |
| GCA | Gaurishankar Conservation Area |
| GoN | Government of Nepal |
| IUCN | International Union for Conservation of Nature |
| ISLT | International Snow Leopard Trust |
| KCA | Kangchenjunga Conservation Area |
| LNP | Langtang National Park |
| LSLCC | Local Snow Leopard Coordination Committee |
| MAP | Medicinal and Aromatic Plants |
| MBNP | Makalu-Barun National Park |
| MCA | Manaslu Conservation Area |
| MFSC | Ministry of Forests and Soil Conservation |
| MIST | Management Information System Technology |
| MoU | Memorandum of Understanding |
| MVP | Minimum Viable Population |
| NGO | Non-governmental organization |
| NML | Northern Mountain Landscape |
| NTNC | National Trust for Nature Conservation |
| NSLAC | National Snow Leopard Advisory Committee |
| NSLCC | National Snow Leopard Coordination Committee |
| NTFP | Non timber Forest Products |
| RNP | Rara National Park |
| SAWEN | South Asia Wildlife Enforcement Network |
| SHL | Sacred Himalayan Landscape |
| SLCC | Snow Leopard Conservation Committee |
| SLIMS | Snow Leopard Information Management System |
| SNP | Sagarmatha National Park |
| SPNP | Shey Phokshundo National Park |
| SSLCC | Sector Snow Leopard Coordination Committee |
| UNDP | United Nations Development Program |
| USAID | United States Agency for International Development |
| WCCB | Wildlife Crime Control Bureau |
| WWF | World Wildlife Fund |

Foreword



Government of Nepal
Ministry of Forest and Soil Conservation
Department of National Parks & Wildlife Conservation



Snow leopard (*Panthera uncia*) is an indicator species of a healthy mountain ecosystem and widely but patchily distributed along the alpine zone of Nepal's Himalaya. Retaliatory killings, loss of prey base, habitat degradation and fragmentation, and illegal trade are the major threats for the survival of snow leopards. Moreover, impacts of climate change due to accelerated human interventions are the growing challenges in the recent years.

Realizing these issues, the Government of Nepal prepared the national Snow Leopard Conservation Action Plan in 2005. The action plan has been implemented in collaboration with conservation partners and local communities. Some of the achievements of the implementation include estimation of snow leopard population, establishment of community-based snow leopard and prey base monitoring mechanism, establishment of community-based livestock insurance scheme, and research using cutting-edge technologies such as camera traps and fecal DNA analysis. I would like to thank WWF Nepal and National Trust for Nature Conservation for joining hands in the implementation of the action plan.

The revision in the action plan is a part of the efforts of the Government of Nepal to consolidate ongoing initiatives and address the contemporary issues and challenges for the conservation of snow leopards and their habitat. I believe the revised action plan will be a benchmark document to guide conservation strategies aimed at minimizing the threats towards snow leopards and their habitat.

I would like to thank the task force team and reviewers for their efforts to revise this action plan. I would like to acknowledge the leadership of Dr. Maheshwar Dhakal, Ecologist, in the revision process. I would also like to extend my sincere appreciation to WWF Nepal for its generous support for the revision and publication of this action plan.

Megh Bahadur Pandey
Director General

Executive Summary

The national Snow Leopard Conservation Action Plan was endorsed by the Government of Nepal in 2005. This action plan has been revised realizing the changing context and emerging threats to snow leopards and their habitat. The current revision is largely based on the analysis of gaps while implementing the action plan, emerging threats such as impacts of climate change, unplanned villages and district roads, and opportunities for snow leopard conservation in Nepal. The analysis was made based on the recommendations of a national seminar on snow leopards held in Kathmandu in 2008. Review of contemporary literatures, and consultation with national and international experts, protected area authorities and local communities were conducted during the revision process.

The revised action plan is divided into two chapters. Chapter One presents the implementation status of the snow leopard action plan, with a progress review and gap analysis. Emerging threats and opportunities for snow leopard conservation are also identified in Chapter One. Chapter Two describes the revised action plan with a logical framework envisioning three snow leopard conservation complexes in Nepal for long term management of minimum viable populations. It also highlights the strategies for implementation, monitoring and financial sustainability.

The objectives and strategies outlined by this action plan in order to achieve the goal are presented in the table below.

| Objective | Strategy |
|---|--|
| Objective 1: Update the status and distribution of local and meta-populations of snow leopards and their prey. | Apply cutting-edge technologies |
| | Capacitate and mobilize citizen scientists and local communities |
| Objective 2: Manage snow leopard habitat by addressing the impacts of climate change at the landscape level. | Map climate variability and vulnerability of snow leopard habitats |
| | Identify priority core habitats, critical corridors, and climate refugia |
| | Promote traditional/indigenous herding knowledge, and sustainable grazing practices |
| Objective 3: Reduce human-snow leopard conflicts | Develop snow leopard-based ecotourism |
| | Develop and institutionalize insurance schemes for snow leopard victims |
| | Introduce improved herding practices |
| Objective 4: Increase awareness on snow leopard conservation | Develop formal and informal awareness materials |
| | Conduct national, regional and local seminars, workshops and meetings |
| | Share knowledge on conservation initiatives in Nepal to international conservationists and donors via journals |
| | Strengthen capacity of staffs in the PAs |
| Objective 5: Reduce and control snow leopard poaching and illegal trade | Strengthen and mobilize youths and local communities |
| | Intensify law enforcement |
| | Strengthen trans-boundary and regional collaboration |
| Objective 6: Consolidate collaborative efforts of the Government of Nepal with conservation partners | Develop collaborative mechanisms for snow leopard conservation |
| | Promote bilateral and regional learning and sharing |

This action plan estimates a budget of US\$3.43 million for the next five years to conserve snow leopards. The estimated budget will be generated by the Government of Nepal together with conservation partners, donors, and the private sector.

CHAPTER I

Background

The snow leopard (*Panthera uncia*) has a wide distribution across central Asia (Fox, 1989) and along the Himalayan region (Figure 1). In Nepal, snow leopards are thought to be found in five habitat blocks (Figure 2), namely the Western, Rolwaling, Sagarmatha, Makalu-Barun and Kangchenjunga. Based on habitat use analysis aided by empirical studies, the total snow leopard habitat in Nepal (Figure 2) is estimated at about 13,000 km² (Table 1). The population estimate, based on linear

relationships between genetic analysis and scrape encounter rates, which have been cross-verified with predator-prey relationship is 301-400 animals (WWF Nepal, 2009). The population density ranges from 1.5 to 3.2 animals/100 km² (Table 2), with the highest density found in western Nepal followed by Kangchenjunga, Sagarmatha and Rolwaling. While the population in western Nepal is estimated to be between 280-349 animals, the population in the other blocks is estimated at less than 25 animals.

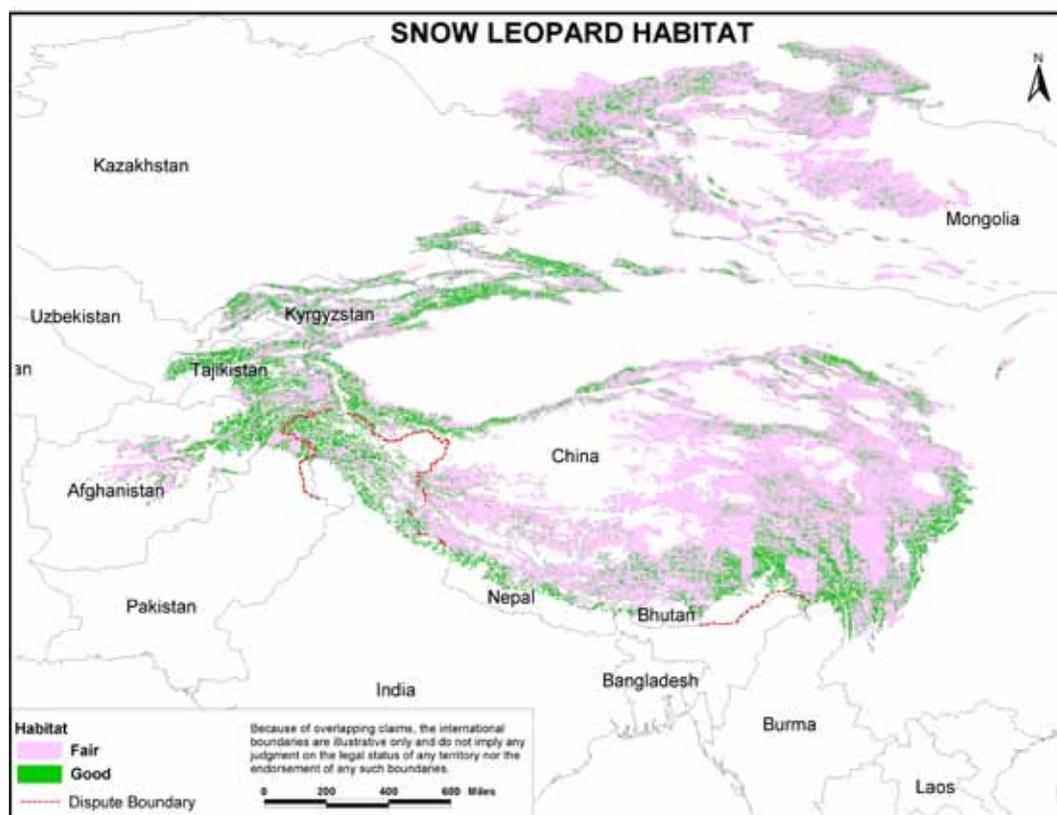


Figure 1 Distribution of snow leopard habitats in the central Asia of Himalayan region (source: Jackson and Hunter, 1996)

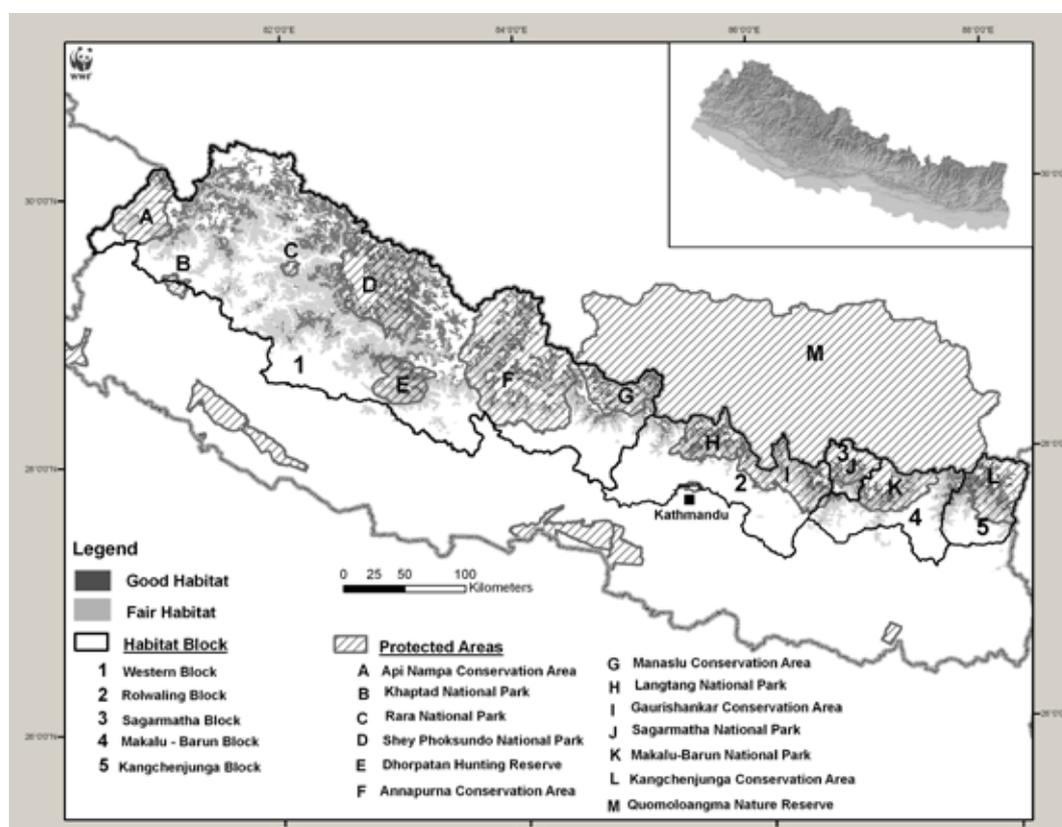


Figure 2 Snow leopard habitat blocks in Nepal Himalaya (WWF Nepal, 2009)

Table 1 Habitat blocks of snow leopard in Nepal

| Habitat blocks | Snow leopard potential habitat (km ²) | Description of block |
|----------------|---|---|
| Western | 9,915 | Extends from Darchula district in far western Nepal to Dhading district in the east-central region which includes Api-Nampa Conservation Area (ANCA), Shey Phokshundo National Park (SPNP), Rara National Park (RNP), Dhorpatan Hunting Reserve (DHR), Annapurna Conservation Area (ACA) and Manaslu Conservation Area (MCA). |
| Rolwaling | 1,129 | Starts from the eastern part of Ganesh Himal and extends to the western part of Tashi Lapcha, which covers Langtang National Park (LNP) and Gaurishankar Conservation Area (GCA). |
| Sagarmatha | 220 | Spreads from eastern part of Tashi Lapcha to the northwest towards Ama Lapcha/ Mera peak which falls within Sagarmatha National Park (SNP). |
| Makalu- Barun | 853 | Begins in the eastern part of Mera peak and extends to the north-west of Topke Gola which falls within Makalu-Barun National Park (MBNP). |
| Kangchenjunga | 698 | Begins from Topke Gola and extends to the Indian boarder of Sikkim which includes Kangchenjunga Conservation Area (KCA). |
| Total Area | 12,815 | |

Source: WWF Nepal, 2009

Table 2 Population status of snow leopards in Nepal

| Habitat Blocks | Density/100 km ² | Number | | |
|----------------|-----------------------------|--------|-------|-------|
| | | Mean | Lower | Upper |
| Western | 3.2 | 319 | 280 | 349 |
| Rolwaling | 1.5 | 17 | 6 | 24 |
| Sagarmatha | 1.8 | 4 | 2 | 5 |
| Kangchenjunga | 2.6 | 18 | 13 | 21 |
| Total | | 358 | 301 | 400 |

Source: WWF Nepal, 2009

Progress and Status of the Snow Leopard Conservation Action Plan

The snow leopard conservation action plan for Nepal, endorsed in 2005, was devised with the broader aim to maintain a viable population of snow leopards, with considerations of the socio-cultural aspects of mountain communities. The plan is currently implemented by the Department of National Parks and Wildlife Conservation (DNPWC) in close partnership with the Department of Forests (DoF), National Trust for Nature Conservation (NTNC), WWF Nepal, and other local, national, and international conservation organizations.

Major interventions include:

- Nationwide population estimate of snow leopards;
- Regional level (Eastern Himalaya-wide) analysis of the impacts of climate change on snow leopard habitat;
- Non-invasive genomic analysis of snow leopards;
- Human-snow leopard conflict mitigation through community-managed livestock insurance scheme in KCA; and
- Community-based snow leopard monitoring system initiation in several sites.

The Government of Nepal (GoN) established Gaurishankar Conservation Area (GCA) and Api-Nampa Conservation Area (ANCA) in 2010. GCA and ANCA have an estimated area of 217,900ha and 190,300ha respectively, which also includes snow leopard habitats. Declaration of the two areas as protected areas is one of the milestones for conserving mountain flagship species, including the snow leopard. Similarly, the government endorsed the Sacred Himalayan Landscape (SHL) Strategic Plan (2006-2016) in 2006 and the SHL Interim Implementation Plan (2010-2014) in 2010, which provided opportunities to implement snow leopard

conservation initiatives at the landscape level. Establishment of the national level Wildlife Crime Control Bureau (WCCB) under the chairmanship of the Director General of DNPWC and its district cells in Sindhupalchok and Darchula district under the chairmanship of District Forest Officer, has contributed towards controlling poaching and illegal trade of wildlife. Moreover, signing of the Memorandum of Understanding (MoU) between China and Nepal in 2010 and a resolution between India and Nepal in 2010 are important steps towards trans-boundary and regional level collaboration for conservation.

Major Constraints in Implementation

Snow leopard is on the list of protected species backed by a strong legal provision under the National Parks and Wildlife Conservation Act, 1973. Despite this listing and conservation initiatives undertaken to date, much remains to be done to ensure effective conservation of snow leopards. Because snow leopards exist in the remote, high mountain areas that are relatively inaccessible, conservation efforts require large budgets and highly motivated and skilled people who are willing to work under difficult conditions. Unlike tiger conservation, the opportunities to get substantial funds for snow leopard conservation are limited even though snow leopards are considered an umbrella species for alpine ecosystems and an indicator species of ecosystem health. Moreover, the survival of snow leopards in the high mountains of Nepal is largely dependent on the willingness of the local people to participate in its conservation.

Implementing a science-based, adaptive conservation strategy requires in-depth information on snow leopard ecology and behavior. Such information is lacking because of inadequate research to address these aspects of snow leopard biology using contemporary methods and tools. In addition, prevailing national research policy and a

dearth of trained researchers constrain important research on snow leopards. More importantly, there is also insufficient coordination among stakeholders and a lack of national drive to implement the snow leopard conservation action plan.

Conservation Threats

Despite Nepal's continual actions to conserve snow leopards, it remains under threat from human-snow leopard conflicts; especially from retaliatory killings which is largely due to depredation on livestock. Poaching of snow leopards for illegal trade of skins and bones is another widespread threat to snow leopard conservation. Open borders with China and India trigger wildlife crimes, particularly poaching and illegal trade. Loss of prey in some protected areas such as Sagarmatha National Park (Lovari et al., 2009, Ale et al., 2010) and outside the protected areas (Kattel, 1995) is another threat to snow leopard survival. Habitat degradation due to unsustainable grazing, and collection of Non Timber Forest Products (NTFP) and Medicinal and Aromatic Plants (MAPs) for commercial trade are additional threats to snow leopard conservation.

Emerging Threats

Impacts of climate change have emerged as unavoidable threats to snow leopards and their habitats. Models based on global climate change trajectories suggest that Nepal will lose about 40% of alpine habitat due to upslope habitat shifts (Forrest et al., 2012). The projected consequences will be the loss, degradation and fragmentation of snow leopard habitats, isolating populations within smaller habitat patches, and compromising their demographics, which include their ecological and even genetic viability. Habitat shifts may cause overlapping of snow leopard habitat with other cats resulting in increased competition. Many of the traditional pastoralist systems are currently in the process of substantial change due to external influences related to modern development (Miller, 1987) that could significantly influence the alpine predator-prey system. Rapid spreading of village

and district roads throughout the country is leading to the loss of snow leopard habitats. Construction of highways could also result in habitat fragmentation (Thapa, 2005) and increased wildlife crimes in Mustang and Rasuwagadhi. Unregulated high volume tourism could result in increased stress and other negative impacts on snow leopard habitats and snow leopard populations in SNP and ACA.

Emerging Opportunities

Recent advances in wildlife techniques, such as non-invasive genetic sampling (Janecka et al., 2008; Lovari et al., 2009; Wegge et al., 2012), camera-trap surveys (Karanth & Nichols, 1998; Jackson et al., 2006), and satellite telemetry (McCarthy et al., 2005; McCarthy et al., 2008) offer possibilities for better and more rigorous studies on the ecology and behavior of snow leopards. Genetic analysis of fecal DNA shows potential to develop an index of snow leopard abundance and population structure, including information on sex and genetic relationships between different populations.

Snow leopards are a wide-ranging species that require landscape level conservation efforts. About 28% snow leopard habitat falls outside the protected area system in Nepal. Maintained contiguity and connectivity of the protected areas and habitats is important for landscape level conservation. This will require strengthened coordination between the government agencies, conservation partners and other stakeholders. .

Conservation of snow leopards will largely be decided by the active participation of people in the high mountain regions. Local communities have been experiencing economic losses due to livestock depredation by snow leopards. Being a charismatic species, there is a high potential to generate income through promoting nature-based eco-tourism featuring snow leopards. This opportunity will not only enhance the livelihoods of local communities but will also raise awareness on snow leopard conservation.

CHAPTER II

Conservation Action Plan

Goal

Maintain viable populations of snow leopard and ecosystem integrity in the Nepal Himalaya.

Three snow leopard conservation complexes are envisioned in Nepal (Figure 3) for long term management of the minimum viable populations (MVP) of at least 50 breeding snow leopards. The MVP will be maintained in the Western conservation complex (from Darchula district to Tscharka pass,

the border of Dolpa and Mustang) and Annapurna-Manaslu conservation complex (from Tscharka pass to Rasuwagadhi in the east-central region of Nepal) which is contiguous habitat of this wide ranging species. However, in the Eastern conservation complex (from Rasuwagadhi to eastern part of KCA), which is fragmented habitats without east-west connectivity in Nepal, the MVP of snow leopard populations is, thus, dependent on connectivity with populations in China and India.

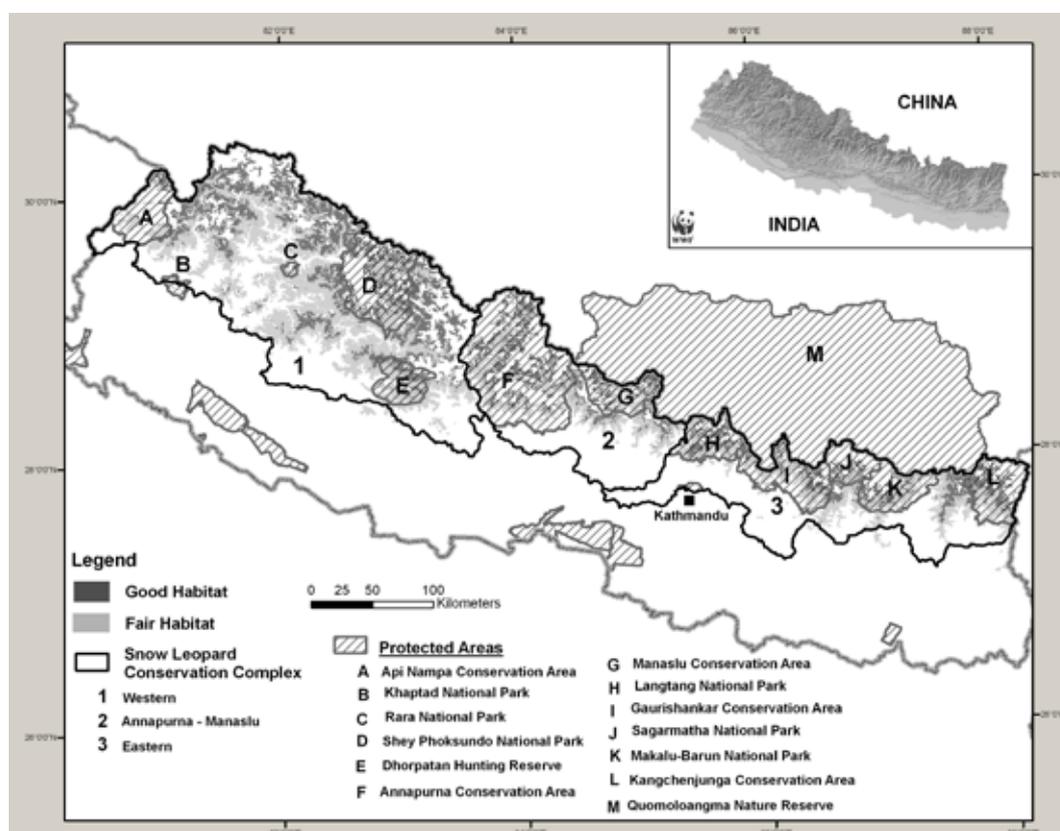


Figure 3 Snow leopard conservation complexes in Nepal

Objective

1. Update the status and distribution of local and meta-populations of snow leopards and their prey base

Rationale

Understanding the distribution of snow leopards and finding reliable abundance estimates is an important pre-requisite in order to undertake appropriate conservation and management measures. However, due to the snow leopard's highly elusive behavior, such estimates have been based on indirect index methods such as sign encounter rates (Fox, 1989). Also, information on genetic relationships between scattered snow leopard populations is required to understand the meta-population dynamics and structure of this species. The data available on snow leopard biology is scant, biased, and outdated (Lovari et al., 2009). Therefore, more accurate information on their spatial distributions, habitat use and preferences, and ranging behavior is required to design landscape level conservation strategies. This is especially important in the context of potential habitat barriers which might prevent snow leopards from dispersing between the habitats, especially in the context of climate change. Because good snow leopard habitat in Nepal is contiguous with the vast Quomoloangma Nature Reserve in Tibet's Trans-Himalaya region (WWF, 2009), it is essential to ensure habitat connectivity.

Strategy

Cutting-edge technologies such as non-invasive molecular genetics and satellite GPS tracking will be applied to maintain the status and distribution of snow leopard populations. Non-invasive molecular genetic technology (Jackson et al., 2006; Janecka et al., 2008; McCarthy et al., 2008 and Karmacharya et al., 2011) will be used to determine the genetic relationships between snow leopard subpopulations. This genetic information will also be combined to calibrate data from sign and camera-trap surveys to get more reliable estimates of abundance and population densities. Satellite GPS tracking will be used to determine habitat use and behavior of snow leopards. Unlike conventional VHF radio-collaring studies, where data gathering is contingent on accessibility to researchers, satellite GPS collars will eliminate bias and provide a more reliable picture of

habitat use and ranging patterns of snow leopards (McCarthy et al., 2005). Combining these data with satellite imagery, and including a study on snow leopard population and the impact of climate change, will provide information on habitat availability, preferences and conservation requirements to manage viable snow leopard meta-populations.

Citizen scientists¹ and local communities will be trained and mobilized to monitor snow leopards and prey base species. Standard protocols will be applied towards snow leopard and prey base monitoring. They will also be capacitated and mobilized for snow leopard research. This will be a cost effective way to get substantial, reliable data while also ensuring local ownership.

Activities

- 1.1 Conduct non-invasive genetic analyses to assess 'relatedness' of subpopulations, genetic diversity, and abundances.
- 1.2 Conduct camera trap and sign surveys using Snow Leopards Information Management System (SLIMS) protocols and engage citizen scientists and local communities through Snow Leopard Conservation Committees (SLCC) to understand the distribution of snow leopards, monitor their population status, and estimate snow leopard population abundance and densities.
- 1.3 Conduct population surveys of primary snow leopard prey species.
- 1.4 Assess pasture quality, herding practices, habitat preferences and interactions between wild and domestic ungulates.
- 1.5 Use satellite GPS tracking to determine habitat use, ranging patterns, and activity of snow leopards.
- 1.6 Conduct spatial analyses of satellite GPS and remote-sensed data to identify core snow leopard habitat and dispersal habitat. Combine the information with climate projections to develop a climate-integrated landscape conservation plan.
- 1.7 Update the status of snow leopard populations in the country and integrate it into a monitoring plan.
- 1.8 Develop zoning and conservation management plan for mountain ecosystems.

¹ Citizen scientists are the local resource persons enlightened with the knowledge of snow leopard ecology and behavior

Expected Outcomes

1. Snow leopard populations (size, abundances, and densities) will be estimated and updated.
2. Information on 'relatedness' and genetic variability of snow leopard populations in Nepal will be updated.
3. Populations of prey base in snow leopard habitat complexes will be estimated and updated.
4. Understanding on important ecological processes such as predator-prey relationships between snow leopard and its prey, and resource partitioning/competition among and between snow leopard's prey and livestock will be documented.
5. Snow leopard habitats will be mapped for spatial conservation planning and monitoring.
6. Databases of population status for monitoring will be established and updated.

Objective

2. Manage snow leopard habitat addressing the impacts of climate change at the landscape level

Rationale

Climate change scenario projections indicate a northward shift of forests due to global warming and moister conditions expected under climate change trajectories (IPCC, 2007; Rupa et al., 2006). Since forest habitats do not generally constitute good snow leopard habitats, this shift will result in significant loss and fragmentation of snow leopard habitats. It is projected that Nepal will lose about 40% of the current alpine areas (Forrest et al., 2012). Consequently, snow leopards can become isolated in smaller fragments, compromising their demographics and their ecological as well as genetic viability.

Strategy

Studies and action research will be conducted to project the impacts of climate change on snow leopards and their habitats. The results will be integrated with the information from Objective 1 to develop a climate-integrated conservation plan for Nepal which in turn will identify climate resilient core areas and dispersal linkages, across the Himalayas and within the Trans-Himalayan region. The conservation plan will also consider the role of snow leopards as an apex species in the high Himalayan ecosystems, and as an indicator of the impacts of climate change and other local anthropogenic activities on the ecological integrity on sensitive habitats.

Activities

- 2.1 Conduct predictive modeling to assess the impacts of climate change on snow leopard habitats and identify priority core areas, dispersal linkages, and multiple use areas for zoning under conservation management plans.
- 2.2 Develop and implement sustainable grazing practices and sustainable collection of Non Timber Forest Products (NTFP) and MAPS to reduce habitat degradation.
- 2.3 Develop monitoring protocols with defined criteria and indicators to detect changes in these priority areas to assess habitat quality and availability.

Expected Outcomes

1. A long-term climate-integrated landscape level snow leopard conservation plan with management zones developed.
2. Critical climate-resilient core areas and dispersal linkages for snow leopards identified, protected and managed.
3. Sustainable grazing practices regulated to minimize habitat degradation.
4. Sustainable collection and harvesting of NTFPs and MAPs initiated to minimize habitat degradation.
5. Regular monitoring of habitat changes due to anthropogenic as well as climate-related issues initiated.

Objective

3. Reduce human-snow leopard conflicts

Rationale

Human-snow leopard conflict is one of the major issues in snow leopard conservation. Local communities sometimes kill snow leopards in retaliation to predation on their livestock. The mountain ungulates, such as blue sheep and Himalayan tahr, prey of the snow leopards, are widely excluded by the herders because of the perception that these wild ungulates compete for forage with domestic livestock (Mishra et al., 2001; Shrestha & Wegge, 2008). Consequently, snow leopards prey on domestic livestock, increasing conflict with herders (Bagchi & Mishra, 2006). But, even when there is an abundance of natural prey, snow leopards often do prey on livestock since they are an easier prey to kill, which is directly related to the loss of traditional guarding systems in the high mountains of Nepal (Sharma et al., 2006).

Strategy

DNPWC, WWF Nepal, NTNC and other conservation organizations have been implementing both preventive and remedial mitigation measures in the Northern Mountain Landscape, SHL, ACA, and MCA to build community stewardship for snow leopard conservation. A community-managed livestock insurance scheme has been successfully piloted in the Ghunsa valley of KCA (Gurung et al., 2011), and has now been introduced in LNP and SPNP. This insurance scheme is largely self-sustaining and is locally managed and administered. Most importantly, it has recently been demonstrated as a more rational approach in conserving snow leopards compared to other remedial measures (Gurung et al., 2011; Wegge et al., 2012). The results from KCA, LNP and SPNP have been highly promising and therefore such schemes (Gurung et al., 2011) will now be replicated across Nepal.

Other innovative solutions such as the construction of predator-proof corrals, conservation awareness campaigns to guard livestock by herders, and veterinary services will be initiated to reduce both depredation and retaliation.

Citizen scientists and SLCCs will be trained to verify depredation events, and to make relief payments as guided by the community based livestock insurance scheme.

Alternative sources of livelihoods that can be linked to snow leopards will also be piloted. For instance, the snow leopard's charismatic appeal can be used to promote nature-based tourism in the mountain areas.

Activities

- 3.1 Form, capacitate and strengthen the SLCCs.
- 3.2 Establish endowment funds for community-based livestock insurance schemes.
- 3.3 Train SLCCs members to efficiently administer livestock insurance schemes.
- 3.4 Train and equip SLCC members to monitor the activities of snow leopards and their prey using a standardized protocol.
- 3.5 Strengthen the traditional rotation grazing system such as the Nawa system in Khumbu Valley to reduce habitat degradation (related with objective 2) and minimize grazing competition with livestock.
- 3.6 Prepare an inventory of livestock pens.

- 3.7 Monitor livestock numbers and losses.
- 3.8 Assess and monitor the nature, intensity, and trends of human-snow leopard conflicts.
- 3.9 Provide predator-proof corrals.
- 3.10 Institute system of guard dogs and a better guarding system.
- 3.11 Provide access to veterinary services for livestock and guard dogs.
- 3.12 Develop a snow leopard-based ecotourism plan.
- 3.13 Develop, capacitate and mobilize citizen scientists towards snow leopard protection.

Expected Outcomes

1. Human-snow leopard conflict mitigation strategy will be developed and implemented.
2. Retaliatory killings of snow leopards will be minimized.
3. Site specific snow leopard-based ecotourism plan will be prepared and implemented.

Objective

4. Increase awareness on snow leopard conservation

Rationale

A long-term conservation plan for snow leopards will require an adequate level of awareness, from the primary stakeholders at the grass root level to the decision-makers responsible for planning and policy-making. In doing so, the awareness programs have to be designed keeping the audience in mind. For instance, the literacy rate amongst subsistence herder communities in the high mountain is very low. On the other hand, the decision-making bodies do not seem to have a good understanding of the conservation needs on the ground. Thus, it is required to develop and implement a site-specific and audience-specific awareness program. This will help to disseminate information on the role that snow leopards play in maintaining integrity of high alpine ecosystems, the decline in snow leopard numbers, and the proven solutions in conserving snow leopards.

Strategy

Organize appropriate training, meetings, workshops, and seminars for a wider audience from the community to the decision makers in order to increase awareness on snow leopard conservation. Develop awareness materials, including school curricula and modules for eco-clubs and other CBOs and also utilize electronic and print media.

Activities

- 4.1 Develop and upgrade snow leopard conservation awareness approaches for both formal (school curriculum) and informal sectors (eco-club, adult literacy classes, herder groups and local communities).
- 4.2 Conduct workshops and seminars at the local, district, national and international levels.
- 4.3 Develop training packages and conduct specific trainings and interactive programs for herders.
- 4.4 Publish books, posters, newspaper and magazine articles, radio and TV programs, flip charts, and leaflets on snow leopard conservation (in English, Nepali and local languages)
- 4.5 Prepare and publish manuscripts on snow leopards in peer-reviewed international journals.
- 4.6 Organize exposure visits and study tours for authorities, communities, and other stakeholders.

Expected Outcomes

1. Awareness level on snow leopard conservation, from the grass root level to decision-making bodies will be increased.
2. Support for snow leopard conservation will be increased with less persecution of snow leopards.
3. National database on snow leopards will be established.

Objective

5. Reduce and control snow leopard poaching and illegal trade

Rationale

Snow leopards are poached for their pelt, which is in high demand in the international markets. Since snow leopard habitats are located in the high mountains, in close proximity to the international market in the Tibet Autonomous Region (TAR) of China, they are vulnerable to poaching and trade. Strengthening capacity of enforcement agencies and mobilization of local communities are crucial to control poaching and illegal trade. Likewise, effective trans-border collaboration amongst the governments of Nepal, China and India is urgently

required. Regional cooperation is also important for landscape level conservation of snow leopards.

Strategy

Management Information System Technology (MIST) will be implemented through the strengthening and mobilization of Community-based Anti-Poaching Operation (CBAPO) teams and SLCCs in collaboration with enforcement authorities. MIST makes it easy for decision makers to access up-to-date information for strategic planning, monitoring and evaluation. Currently there are 26 functional CBAPO teams in SHL.

It is also very important to mobilize local enforcement authorities to uproot the illegal trans-boundary trade nexus. The MoU signed between the governments of Nepal and China in 2010 will be instrumental in boosting coordination and cooperation to curb illegal trade of wildlife parts and products across the international border.

Activities

- 5.1 Strengthen and mobilize CBAPO teams.
- 5.2 Organize MIST trainings for CBAPO teams and enforcement authorities.
- 5.3 Establish local/district units of WCCB.
- 5.4 Establish informant networks in strategic locations to provide intelligence on wildlife trade and trade networks.
- 5.5 Establish a system of rewards and incentives.
- 5.6 Organize regular coordination meetings for sharing information on illicit activities with TAR, China to curb illegal trade in wildlife parts between the two countries.
- 5.7 Organize local and national level trans-boundary meetings with India and China.
- 5.8 Organize regional level meetings and establish regional cooperation for snow leopard conservation.

Expected Outcomes

1. Poaching of snow leopards will be reduced.
2. The illegal trade of wildlife parts will be reduced to non-threatening levels.
3. Collaborative conservation efforts among China, India and Nepal will be initiated.

Objective

6. Consolidate collaborative efforts of the government with conservation partners

Rationale

Because snow leopards live in inaccessible regions of remote high mountains, their study, research and conservation requires motivated, skilled and well-equipped human resources. Thus, implementation of the action plan requires not only commitment from the government but also financial and technical contributions from conservation partners and donors. Conservation partners such as WWF Nepal, NTNC, International Union for Nature Conservation (IUCN), Himalayan Nature, Wildlife Conservation Society, Snow Leopard Conservancy and International Snow Leopard Trust, and donors such as the World Bank, United States Agency for International Development (USAID), United Nations Development Program (UNDP), MacArthur Foundation, Global Environmental Facility, American Himalayan Foundation, Panthera Foundation and private sector organizations are expected to support the implementation of the conservation action plan.

Strategy

Collaborative efforts will be made to conserve snow leopards under the leadership of DNPWC and with the active participation of conservation partners, donors, and the private sector.

Activities

- 6.1 Organize meetings, workshops and seminars with conservation partners to develop a

comprehensive proposal to raise funds to help implement activities outlined in this action plan.

- 6.2 Explore potential funding sources and seek funds and technical support from international organizations and donors.
- 6.3 Network with conservation partners to ensure sustainable funding for the required project duration.

Expected Outcomes

1. Funds to implement the revised snow leopard conservation action plan will be channelized and secured.
2. Technical support from international organizations will be in place.

Implementation Strategy

Institutional mechanism: At the policy level, a National Snow Leopard Advisory Committee (NSLAC) will be formed under the chairmanship of the Secretary of the Ministry of Forests and Soil Conservation (MFSC). At the national execution level, a National Snow Leopard Coordination Committee (NSLCC) will be formed under the chair of Central Landscape Conservation Unit (CLCU). Similarly, Sector Snow Leopard Coordination Committee (SSLCC) will be formed under the chairmanship of the Regional Director of MFSC to monitor implementation. Local Snow Leopard Coordination Committee (LSLCC) will be formed under the chairmanship of the Warden/DFO. The details of the framework are presented in the table below.

| Institution | Representative |
|--|--|
| National Snow Leopard Advisory Committee (NSLAC) | <p>Chair: Secretary, Ministry of Forests and Soil Conservation (MFSC)</p> <p>Members:</p> <ol style="list-style-type: none"> 1. Representative from the Ministry of Environment 2. Representative from the Ministry of Finance 3. Representative from the Ministry of Home Affairs 4. Representative from donor agencies 5. Chiefs of conservation partners 6. Director General (DG)/DNPWC 7. Director General/DOF <p>Member Secretary: Chief Environment Division/Chief Central Landscape Conservation Unit (CLCU)/MFSC</p> <p>Secretariat: CLCU Unit/MFSC</p> |

| | |
|--|--|
| National Snow Leopard Coordination Committee (NSLCC) | <p>Chair: Chief Environment Division/Chief CLCU/MFSC</p> <p>Members:</p> <ol style="list-style-type: none"> 1. Deputy Director General (DDG)/DNPWC 2. Deputy Director General/DOF 3. Representative: WCCB 4. Representatives: conservation partners 5. Representatives: Academia 6. Chairs: Sector Snow Leopard Coordination Committee 7. Chair: Buffer Zone Forum 8. Chair: Federations of Community Forest Users Nepal (FECOFUN) <p>Member Secretary: DDG/Chief Ecologist/DNPWC</p> <p>Secretariat: DNPWC</p> |
| Sector Snow Leopard Coordination Committee (SSLCC) | <p>Chair: Regional Director/MFSC</p> <p>Members:</p> <ol style="list-style-type: none"> 1. Warden/Protected Areas of concerned sector 2. District Forest Officers of concerned districts 3. Representative: WCCB local unit 4. Representative: Buffer Zone Management Committee 5. Representative: FECOFUN district units 6. Chairs: local snow leopard coordination committee <p>Member Secretary: Warden/Protected Area</p> <p>Secretariat: RD Office</p> |
| Local Snow Leopard Coordination Committee (LSLCC) | <p>Chair: Warden/Protected Areas (District Forest Officer if PAs do not exist in the district)</p> <p>Members:</p> <ol style="list-style-type: none"> 1. Warden/Assistant Warden 2. District Forest Officer/Assistant Forest Officer 3. Representative: WCCB local unit 4. Representative: District Administration Office 5. Representative: Security forces 6. Chair: Buffer Zone Management Committee/Conservation Area Management Council 7. Chair: FECOFUN district unit 8. Chairs: Snow Leopard Conservation Committee 9. Representatives: citizen scientists <p>Member Secretary: Assistant Warden/Assistant Forest Officer</p> <p>Secretariat: PA/District Forest Office</p> |

Sustainability

This action plan highlights the sustainable conservation approach for snow leopards and their prey base. Institutional development and strengthening of government agencies such as DNPWC, and DOF district and field offices, is the most important factor in snow leopard conservation. Similarly, capacity enhancement, and institutional strengthening of community based organizations (CBO) such as the SLCCs, Conservation Area Management Council (CAMC), Buffer Zone Management Committees (BZMC) and Community Forest User Groups (CFUG) are also equally important for the sustainability of snow leopard conservation. This action plan will explore sustainable financing mechanisms to ensure the conservation of snow leopards. Some of the possible

mechanisms could be the integration of the action plan with the local government's plans, ecotourism, payment for ecosystem services and regional cooperation.

Monitoring and Evaluation

Being the focal organization for wildlife conservation, DNPWC will lead and coordinate a joint monitoring and evaluation team with the support of partner organizations. Participatory monitoring will be done annually to measure the progress of outlined activities. MIST at DNPWC will be strengthened for effective monitoring. In order to measure the effectiveness of conservation efforts and their impacts and sustainability, mid-term and final evaluations will be conducted after implementation of the action plan during a three- and five-year period.

Logical Framework

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Risks (Assumptions) |
|--|---|---|---|
| <p>Objective 1. Update the status and distribution of local- and meta-populations of snow leopards and their prey base.</p> | <ul style="list-style-type: none"> • Snow leopard population updated in protected areas. • Non-invasive genomic study completed in five complexes of snow leopard habitats • Satellite collars fitted to at least 5 snow leopards in distributed across their a range of habitats • Predator-prey relationship identified | <ul style="list-style-type: none"> • Technical reports • Manuscripts | <ul style="list-style-type: none"> • Funding secured |
| <p>Objective 2. Manage snow leopard habitats addressing climate change impacts at the landscape level.</p> | <ul style="list-style-type: none"> • Number of critical corridors identified • Number of core zones identified • Management zones created | <ul style="list-style-type: none"> • Technical reports • GIS maps | <ul style="list-style-type: none"> • Funding secured |
| <p>Objective 3. Reduce human-snow leopard conflict</p> | <ul style="list-style-type: none"> • Number of SLCCs formed and strengthened • Number of revolving funds up-scaled for insurance schemes • % of retaliatory killing of snow leopards decreased | <ul style="list-style-type: none"> • Reports • Meetings minutes | <ul style="list-style-type: none"> • Funding secured • Willingness of local people to participate will be increased |
| <p>Objective 4. Increase awareness on snow leopard conservation</p> | <ul style="list-style-type: none"> • % of snow leopard population increased • Change in attitudes of local people and decision makers • % of income level generated | <ul style="list-style-type: none"> • Snow leopard-based ecotourism Plan • Reports • Attitude indexes | <ul style="list-style-type: none"> • Visitors interests increased |
| <p>Objective 5. Reduce and control snow leopard poaching and illegal trade</p> | <ul style="list-style-type: none"> • Number of CBAPOUs formed and strengthened • Number of enforcement authorities involved • % of poaching/ trade decreased • Number of coordination meetings initiated through SAWEN units and CITES rules | <ul style="list-style-type: none"> • Reports • Minutes | <ul style="list-style-type: none"> • Funding secured |
| <p>Objective 6. Consolidate collaborative efforts of the Government of Nepal with conservation partners</p> | <ul style="list-style-type: none"> • Number of donors identified • Substantial amount of proposed budget secured | <ul style="list-style-type: none"> • Proposals and database | <ul style="list-style-type: none"> • Funding secured |

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Annex 1. Activity and Budget

| Objective and Activities | Estimated cost in USD | | | | | |
|--|-----------------------|---------|----------|---------|--------|----------------|
| | Year I | Year II | Year III | Year IV | Year V | Total |
| 1. Update the snow leopard status and distribution of local and their meta-populations structure and prey base | | | | | | 820,000 |
| 1.1 Conduct non-invasive genetic analyses to assess 'relatedness' of subpopulations, genetic diversity and abundances | 20,000 | 30,000 | 50,000 | 50,000 | | 150,000 |
| 1.2 Conduct camera trap and sign surveys using Snow Leopards Information Management System (SLIMS) protocols engaging citizen scientists and local communities through Snow Leopard Conservation Committees (SLCC) to understand the distribution of snow leopards, monitor population status, and estimate population abundance and densities | | 40,000 | 40,000 | 40,000 | | 120,000 |
| 1.3 Conduct population surveys of primary snow leopard prey species | 50,000 | | 50,000 | | 50,000 | 150,000 |
| 1.4 Assess pasture quality, herding practices, habitat preferences and interactions between wild and domestic ungulates | 30,000 | | | | | 30,000 |
| 1.5 Use satellite GPS tracking to determine habitat use, ranging patterns, and activity of snow leopards | | 150,000 | 150,000 | | | 300,000 |
| 1.6 Conduct spatial analyses of satellite GPS and remote-sensed data to identify core snow leopard habitat, dispersal habitat. Combine the information with climate projections to develop a climate-integrated landscape conservation plan | | | 20,000 | 30,000 | | 50,000 |
| 1.7 Update the status of snow leopard populations in the country, and integrate into a monitoring plan | | | | | 10,000 | 10,000 |
| 1.8 Develop zoning and conservation management plan for the mountain ecosystems | | | | | 10,000 | 10,000 |
| 2. Manage snow leopard habitat addressing the impacts of climate change at landscape level | | | | | | 165,000 |
| 2.1 Conduct predictive modeling to assess the impacts of climate change on snow leopard habitats, and identify priority core areas, dispersal linkages, and multiple use areas for zoning under conservation management plans | | | | | 75,000 | 75,000 |
| 2.2 Develop and implement sustainable grazing practices and sustainable collection of Non Timber Forest Products (NTFP) and MAPS to reduce habitat degradation | | | | 20,000 | 20,000 | 40,000 |

| | | | | | | |
|--|---------|---------|---------|--------|--------|------------------|
| 2.3 Develop monitoring protocols with defined criteria and indicators to detect changes in these priority areas for habitat quality and availability | | | | 20,000 | 30,000 | 50,000 |
| 3. Reduce human- snow leopard conflicts | | | | | | 1,280,000 |
| 3.1 Form, capacitate and strengthen SLCCs | 15,000 | 15,000 | 15,000 | | | 45,000 |
| 3.2 Establish endowment funds for community-based livestock insurance schemes | 200,000 | 200,000 | 200,000 | | | 600,000 |
| 3.3 Train SLCCs members to efficiently administer the livestock insurance schemes | 10,000 | 10,000 | 10,000 | 10,000 | | 40,000 |
| 3.4 Train and equip SLCCs members to monitor the activities of snow leopards and the prey base using a standardized protocol | 20,000 | 20,000 | 20,000 | 20,000 | | 80,000 |
| 3.5 Strengthen the traditional rotation grazing system such as Nawa system in Khumbu Valley that can reduce habitat degradation (related with objective 2) and minimize grazing competition with livestock | 25,000 | 25,000 | 25,000 | | | 75,000 |
| 3.6 Prepare an inventory of livestock pens | 10,000 | 10,000 | | | | 20,000 |
| 3.7 Monitor livestock numbers and losses | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 50,000 |
| 3.8 Assess and monitor the nature, intensity, and trends of human-snow leopard conflicts | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 25,000 |
| 3.9 Provide predator-proof corrals | | 50,000 | 50,000 | | | 100,000 |
| 3.10 Institute system of guard dogs and better guarding systems | | 50,000 | | | | 50,000 |
| 3.11 Provide access to veterinary services for livestock and guard dogs | | 50,000 | 50,000 | | | 100,000 |
| 3.12 Develop a snow leopard-based ecotourism plan for piloting at least one site of snow leopard habitat in country | | 25,000 | | | | 25,000 |
| 3.13 Develop, capacitate and mobilize citizen scientists for snow leopard | 20,000 | 20,000 | 10,000 | 10,000 | 10,000 | 70,000 |
| 4. Increase awareness on snow leopard conservation | | | | | | 290,000 |
| 4.1 Develop and upgrade snow leopard conservation awareness approaches for both formal (school curriculum) and informal sectors (eco-club, adult literacy classes, herder groups and local communities) | 10,000 | 10,000 | | 10,000 | | 30,000 |
| 4.2 Conduct workshops and seminars at local, district, national and international levels | 20,000 | 30,000 | 30,000 | 20,000 | 20,000 | 120,000 |
| 4.3 Develop training packages and conduct specific training and interactive program for herders | 10,000 | 10,000 | | | 10,000 | 30,000 |
| 4.4 Publish books, posters, newspaper and magazine articles, radio and TV programs, flip charts, and leaflets on snow leopard conservation (in English, Nepali and local languages) | 20,000 | | | 20,000 | | 40,000 |

| | | | | | | |
|---|--------|--------|--------|--------|--------|------------------|
| 4.5 Prepare and publish manuscripts on snow leopard information in peer-reviewed international journals | | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 |
| 4.6 Organize exposure visits and study tours for authorities, communities and other stakeholders | | 20,000 | 20,000 | 5,000 | 5,000 | 50,000 |
| 5. Reduce and control snow leopard poaching and illegal trade | | | | | | 725,000 |
| 5.1 Strengthen and mobilize CBAPO teams | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 75,000 |
| 5.2 Organize MIST trainings for CBAPO teams and enforcement authorities | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 25,000 |
| 5.3 Establish local/district units of WCCB | 20,000 | 20,000 | 10,000 | 10,000 | 10,000 | 70,000 |
| 5.4 Establish informant networks in strategic locations to provide intelligence on wildlife trade and trade networks | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 150,000 |
| 5.5 Establish a system of rewards and incentives | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 75,000 |
| 5.6 Organize regular coordination meetings for sharing information on illicit activities with TAR, China to curb illegal trade in wildlife parts between the two countries | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 150,000 |
| 5.7 Organize local and national level transboundary meetings with India and China | 20,000 | | 20,000 | | 30,000 | 70,000 |
| 5.8 Organize regional level meetings and establish regional cooperation for snow leopard conservation | 30,000 | | 40,000 | | 40,000 | 110,000 |
| 6. Consolidate collaborative effort of Government of Nepal with conservation partners | | | | | | 150,000 |
| 6.1 Organize meetings, workshops and seminars with all conservation partners to develop the comprehensive proposal for raise funds to implement activities outlined in this action plan | 20,000 | | | 30,000 | | 50,000 |
| 6.2 Explore potential funding sources and seek funds and technical support from international organizations and donors | 10,000 | 20,000 | | | 30,000 | 60,000 |
| 6.3 Develop a networking mechanism with conservation partners to ensure sustainable funding for the required project duration | 5,000 | 5,000 | 10,000 | 10,000 | 10,000 | 40,000 |
| Total | | | | | | 3,430,000 |



Snow Leopard Conservation Action Plan for Nepal

2005-2015
(Revised 2012)

Government of Nepal
Ministry of Forests and Soil Conservation
Department of National Parks and Wildlife Conservation

