PROJECT SNOW LEOPARD

Government of India

Ministry of Environment and Forests

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FOREWORD

The Indian Himalaya have numerous unique ecosystems hidden within, which house rich biodiversity including a wealth of medicinal plants, globally important wildlife, besides providing ecological, aesthetic, spiritual and economic services. A significant proportion of these values is provided by high altitude areas located above the forests – the alpine meadows and the apparently bleak cold deserts beyond, an area typified by the mystical apex predator, the snow leopard, which presides over the stark landscape inhabited by its prey including a variety of wild sheep and goats. Over 180,000 km2 of this range is spread over the five Himalayan states of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh, and within most of these states, over a quarter of their area lies within the snow leopard's range.

The snow leopard is a globally endangered species about which little is known. Merely 7,500 are estimated to be surviving over two million square kilometers in the Himalaya and Central Asian mountains, and all over they are facing tremendous human pressures. India is perhaps home to 10% of the global population in less than 5% of its global range, thus having a substantial proportion of its global population. What I find interesting about the area in our country is that the snow leopards and other endangered wildlife here are not restricted to the protected areas we have set up, but are spread across almost the entire landscape. Unlike the forested habitats of the plains, the barriers are often natural such as glacial mountains, and not man-made ones. This however doesn't mean that the region is devoid of any threats. The low density wildlife populations are facing increasing threats posed due to competition with livestock, degradation, poaching, and some species are even facing local extinction Conservation efforts in the region therefore need to be innovative, and move beyond the existing approaches to ensure that wildlife is able to persist not only within protected areas, but also in the larger landscape.

I am happy with the effort undertaken by experts from all over the country, community groups and officers of my ministry in designing the Project Snow Leopard, which will provide the necessary framework and support to strengthen conservation using innovative programmes employing a participatory planning and implementation mechanism. I wish the Project Snow Leopard success.

Hon'ble Minister of Environment & Forests
Ministry of Environment & Forests
Government of India

PREFACE

The snow leopard, and indeed the entire Himalayan landscape and wildlife, forms part of India's unique natural heritage. Our country is gifted with a vast high altitude landscape that is endowed with tremendous biodiversity values and resident people, who have respected, understood and coexisted with wildlife here for millennia. People inhabiting this region, which mostly occurs above the cultivable zone, are primarily pastoral with limited alternatives for survival in a rather austere landscape. The coexistence of people and wildlife in these regions is now threatened due to pressures of the burgeoning human and livestock populations. Since wildlife of the region is spread across the entire landscape (but at low densities), in areas traditionally used by people also, it is important to adapt our conservation approach to suit the needs of this specific region. I am happy to note that my ministry has undertaken this effort to prepare a project after prolonged consultations with most of the important stakeholders of the region that should generate better conservation models not only for the snow leopard range, but for the country in general. The Project Snow Leopard initiative strives to ensure conservation in the region is based on sound science and participatory planning and implementation of programmes that balances the needs of local people and conservation.

The project proposes to put important guidelines in place, build capacity of local people and forest department staff and set up or strengthen institutions at the village, landscape, state and central levels for project design and implementation, and provide funding for implementation and subsequent monitoring. The first four years will be crucial in understanding all aspects of the project based on one site in each of the five states and the programme will then be expanded to cover the entire range.

I complement the team involved in producing this document and am sure that the project will be successful in generating the innovative programmes as envisaged in the document.

Secretary
Ministry of Environment & Forests
Government of India

PROJECT SNOW LEOPARD

GOAL: To safeguard and conserve India's unique natural heritage of high altitude wildlife populations and their habitats by promoting conservation through participatory policies and actions.

DRAFTED BY: Project Snow Leopard Committee instituted by the Ministry of Environment and Forests, Government of India, (vide Notification No. F.No., 15-5/2006 WL I, Dated 31 July 2006) (Annexure 1).

LOCATION: All biologically important landscapes in the Himalayan high altitudes in the states of Jammu & Kashmir, Himachal Pradesh, Uttaranchal, Sikkim, and Arunachal Pradesh.

1 INTRODUCTION

1.1. The northern part of the Indian subcontinent is bounded by Himalaya, the highest mountain chain in the world. These geologically young mountains originated less than 100 million years ago, and stretch over 2500 km, originating in the east near the Namche Barwa peak where the Tsangpo or the Bhramaputra takes a 'U' turn, and extending towards the west up to the area where the Indus takes a turn near the Nanga Parvat. In the east, the range gives way to contiguous lower hills extending into Myanmar and south-east Asia. In the west, there is a complex knot of mountain chains comprising the Hindu Kush, the Pamirs, the Karakorum and the Altai. Another chain of mountains descends into Pakistan as the Salt Ranges. The Himalaya itself is a complex geo-ecological system, beginning with the low hills towards the south called the Siwaliks, that lead into the Middle Himalaya, and finally into the Greater Himalayan chain in the north. There is a general trend of decreasing precipitation from east to west, and from south to north in the Himalaya. There is a vast tract of mountains and plateaus immediately north of the Greater Himalayan chain,

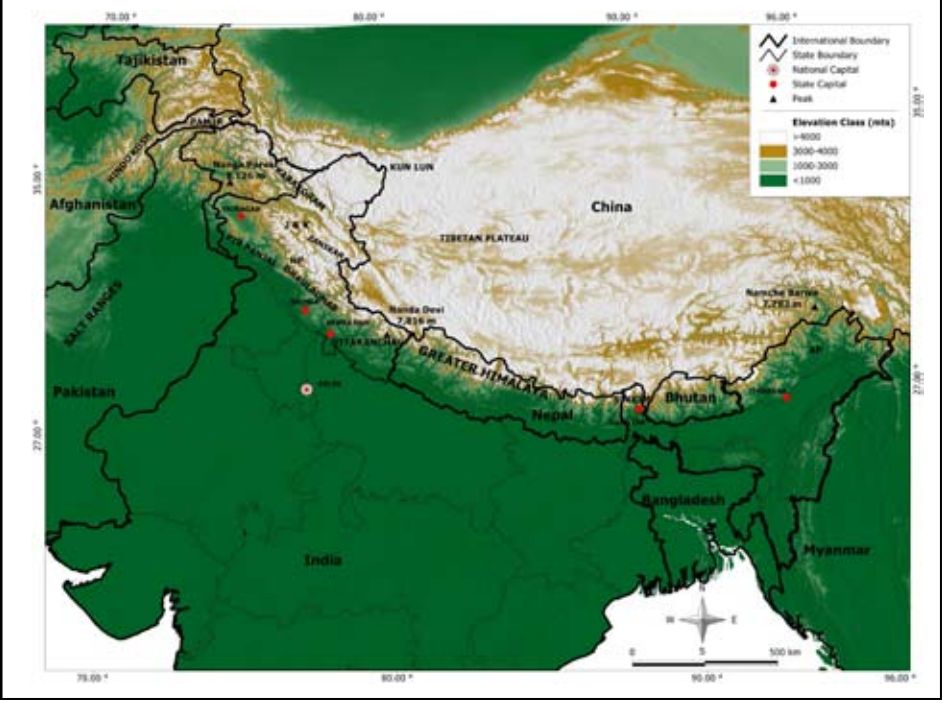

Figure 1. Map of northern India showing the important mountain ranges, including the Himalaya and the Tibetan Plateau, which form the project area for the Project Snow Leopard.

comprising the Trans-Himalaya. These areas of the Tibetan plateau and its marginal mountains lie in the rain-shadow of the Himalaya and are cold deserts. The Siwaliks and the Middle Himalaya have forested areas, while the Greater Himalaya has a few forested tracts, but mostly consists of sub-alpine scrub, alpine meadows and vast areas under permafrost, glaciers and rock faces. The Trans Himalayan cold deserts primarily consist of sparsely vegetated steppes, small patches of moist sedge meadows near water bodies and vast areas that are barren and under permafrost and glaciers. Most of these high altitudes (regions above 3000m) are the headwaters of all major rivers of northern India. The Himalaya are home to unique biodiversity including at least 350 species of mammals, 1200 species of birds, 635 species of amphibians and reptiles[1], and numerous plants including those with medicinal properties. Over 335 species of wild relatives of cultivated crops are found in the region[2]. There are numerous biologically important wetlands that form breeding grounds for waterfowl.

1.2. An important distinctiveness of the higher altitudes of the Himalaya comes from the fact that wildlife populations here occur over most of the landscape, their contiguity broken primarily by natural geographical features such as a high mountain chain or a river, and rarely by human induced barriers. Even endangered species of wildlife are not restricted to protected areas, but occur across the larger landscape. However, the human population density in the Himalayan high altitudes is on the rise and so is the magnitude of people's dependence on the natural

[1] *Pei Shengji 1996. (ed.) Banking on Biodiversity, Report of the Regional Consultation on Biodiversity Assessment in the Hindu Kush-Himalayas, ICIMOD.*

[2] *Arora, R. and Nayar, L. 1984 Wild relatives of crop plants in India. NGPR Science Monograph, New Delhi.*

resources. Since the harsh climate and topography of the area are relatively less conducive to agriculture and other developmental options such as industry, most of the region is largely dependent on pastoralism. Wild herbivore species are getting out-competed and their populations are declining due to increasing livestock populations in many areas[3]. This is leading to an increased dependence of wild predators such as the snow leopard *Uncia uncia* and the wolf *Canis lupus* on livestock[4], causing intense human-wildlife conflicts[5].

Poaching is a major threat in some areas, along with opening up of areas due to road building, pressures from immigrant labour forces, etc[6]. In other areas scarce moist meadows that are important foraging grounds of wild herbivores, are either being converted to cultivation, or fenced to prevent wild ungulate grazing[7]. There are increasing reports of conflicts due to crop depredation by wildlife. Military and para-military personnel need extensive road networks and are usually settled near important but fragile wetland sites or key mountain passes that are also important for wildlife species such as the Tibetan argali *Ovis ammon* and waterfowl. The conservation scenario is fast changing and wild species are declining and becoming locally extinct[8]. Climate change is also expected to affect this landscape significantly that may influence both local livelihoods and biodiversity values of the region.

1.3. The endangered snow leopard occurs over most of the high altitudes of Central Asia and Himalaya[9]. Little is known about the species' ecology, status and even distribution[10]. The coarse global population estimate for the snow leopard is c. 7,400 individuals, and the species is classified as Endangered in the IUCN's Red List. The total potential habitat of the snow leopard globally is estimated to be c. 2 million km^2, with most animals occurring in China, followed by Mongolia and India. India is believed to have between 400 and 700 snow leopards in the five Himalayan states, though these estimates are not precise. With its wide distribution, precarious conservation status, and immense aesthetic appeal, the snow leopard is an effective flagship species for wildlife conservation in the Himalayan high altitudes.

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[3] *Mishra, C. 2001. High altitude survival: conflicts between pastoralism and wildlife in the Trans-Himalaya. Ph.D. Thesis, Wageningen University, The Netherlands.*

[4] *Bagchi, S. and Mishra, C. 2006. Living with large carnivores: predation on livestock by the snow leopard (Uncia uncia). Journal of Zoology (London) 268: 217-224*

[5] *Mishra, C. 1997. Livestock depredation by large carnivores in the Indian trans-Himalaya: conflict perceptions and conservation prospects. Environmental Conservation, 24: 338-343*

[6] *PSL 2006. Towards Project Snow Leopard: report of the national workshop on Project Snow Leopard. 10th-11th July, 2006, Leh, Ladakh. Ministry of Environment and Forests, Govt. of India, Dept. of Wildlife Protection, J&K, Nature Conservation Foundation, and International Snow Leopard Trust, Mysore, India.*

[7] *Bhatnagar, Y. V., Wangchuk, R., Prins, H. H. T., Van Wieren, S. E., Mishra, C. 2006. Perceived conflicts between pastoralism and conservation of the kiang Equus kiang in the Ladakh Trans-Himalaya, India. Environmental Management. 38:934–941*

[8] *Chundawat, R.S. and Qureshi, Q. 1999. Planning wildlife conservation in Leh and Kargil districts of Ladakh, Jammu and Kashmir. Report submitted to the Wildlife Institute of India, Dehradun.*

[9] *Jackson, R.M. 1996. Home range, movements and habitat use of snow leopard (Uncia Uncia) in Nepal. Ph.D. Thesis, University of London, United Kingdom.*

[10] *McCarthy, T. M. and G. Chapron. 2003. Snow Leopard Survival Strategy. International Snow Leopard Trust and Snow Leopard Network, Seattle, USA.*

1.4. Despite the ecological importance, the harsh conditions, and the increasing threats to conservation in the region, the wildlife of the Himalayan high altitudes has received little conservation attention. The Ministry of Environment and Forests (MoEF), Government of India, had initiated work on a flagship Snow Leopard Scheme in 1988[11], but it could not be launched. In 2004, the Nature Conservation Foundation (NCF) began a consultative process in all the five Himalayan states (Jammu & Kashmir, Himachal Pradesh, Uttaranchal, Sikkim and Arunachal Pradesh) to assess the need and scope for initiating Project Snow Leopard. A concept paper was prepared together with the Chief Wildlife Wardens that outlined the project justification and its objectives[12]. The goal of the project was articulated as "*To safeguard and conserve India's unique natural heritage of high altitude wildlife populations and their habitats by promoting conservation through participatory policies and actions.*" These issues were further discussed in separate state level workshops with a cross-section of the Forest and Wildlife Departments in each state. The workshops focused on identifying project areas within each state, the constraints faced by the departments in managing high altitude wildlife, and possible strategies and actions to overcome the constraints. This was followed up with a national workshop in Leh in July 2006 that was sponsored by the MoEF and organized by the Jammu & Kashmir Department of Wildlife Protection, in technical collaboration with NCF and the International Snow Leopard Trust. This workshop brought together officials and decision makers from the Government, scientists from the Wildlife Institute of India and other institutions, and conservation practitioners and NGOs to outline the structure of Project Snow Leopard. Following the recommendations of this national workshop, the MoEF constituted a committee to draft a strategy and action plan for Project Snow Leopard.

1.5. The Project Snow Leopard is an Indian initiative for strengthening wildlife conservation in the Himalayan high altitudes. It aims to promote a knowledge-based and adaptive conservation framework that fully involves the local communities, who share the snow leopard's range, in conservation efforts.

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[11] *Anonymous 1988. The Snow Leopard Conservation Scheme. Ministry of Environment and Forests, Government of India..*

[12] *PSL 2006. Towards Project Snow Leopard: report of the national workshop on Project Snow Leopard. 10th-11th July, 2006, Leh, Ladakh. Ministry of Environment and Forests, Government of India, Department of Wildlife Protection, Jammu & Kashmir, Nature Conservation Foundation, and International Snow Leopard Trust, Mysore, India.*

2 PROJECT JUSTIFICATION

2.1. The high altitudes of India (> 3000 m, c. 130,000 km2, including the Himalaya and Trans-Himalaya biogeographic zones) support a unique wildlife assemblage of global conservation importance. This includes highly endangered populations of species such as the snow leopard *Uncia uncia* two species of bears *Ursus* spp., wolf *Canis lupus*, red panda *Ailurus fulgens*, mountain ungulates such as the wild yak *Bos grunniens*, chiru *Pantholops hodgsoni*, Tibetan gazelle *Procapra picticaudata*, Tibetan argali *Ovis ammon*, Ladakh urial *Ovis vignei*, two species of musk deer *Moschus* spp., the hangul *Cervus elaphus*, three species of goral *Nemorhaedus* spp., serow *N. sumatraensis*, and takin *Budorcas taxicolor*, to name a few. High altitude lakes and bogs provide breeding grounds for a variety of avifauna including the black-necked crane *Grus nigricollis*, bar-headed geese *Anser indicus*, brahminy ducks *Tadorna ferruginia*, and brown-headed gulls *Larus brunnicephalus*.

2.2. There has been relatively less attention on the region from the viewpoint of wildlife conservation. Owing to the efforts of programmes such as Project Tiger and Project Elephant, a substantial proportion of India's population are aware of the precarious conservation status of species such as the tiger *Panthera tigris* and Asian elephant *Elephas maximus*, and of the efforts to conserve them. However, few are aware of even the existence of species such as the chiru, the kiang *Equus kiang*, and the snow leopard in India. Although a Snow Leopard Scheme was thought of about two decades back, it could not be implemented[13]. Recent scientific research has substantially increased our knowledge of wildlife ecology and human society in Indian high altitudes, facilitating the development of a well-informed conservation policy.

2.3. The region represents a vast rangeland system supporting important traditional pastoral economies and lifestyles. Pastoralism in the Indian high altitudes dates back to several millennia, and, today, forms an important traditional means of livelihood that has economic and cultural value. Trade in *pashmina* wool is already an important local industry in many areas. The unique high altitude vegetation, with rare plants, has led to the development of rich local medicinal systems. Many high altitude herbs are also being used by pharmaceutical and *Ayurvedic* industries. Today, natural resource use including grazing and other forms of resource extraction (fuel, timber, medicinal plants) is pervasive in the entire Indian high altitude landscape, including inside protected areas.

2.4. The region provides essential ecosystem services and harbours river systems vital for the nation's food security. Several perennial rivers such as the Indus, Ganga, Yamuna, Sutluj, Tista and Bhramaputra, have their main catchments in the Indian high altitudes and supply drinking water, irrigation, and electricity to the entire north and north-eastern states of India. Degradation and erosion of the fragile mountainous landscape will therefore not just threaten the region's natural resources, but also the nation's food security.

[13] *Anonymous. 1988. The Snow Leopard Scheme. Ministry of Environment & Forests, Government of India.*

2.5. The high altitudes of India represent a unique biogeographic region where wildlife is distributed across the landscape, and not restricted to protected areas. This includes populations of large carnivores such as the snow leopard, wolf *Canis lupus*, and brown bear *U. arctos*. In fact, highly endangered populations of species such as the Ladakh urial, chiru, Tibetan gazelle, and Tibetan argali as also black-necked crane *Grus nigricollis* occur primarily outside the protected area network. Conservation efforts therefore need to look beyond the network of protected areas, and development activities across the entire landscape need to be made ecologically responsible.

2.6. India has ratified international agreements promoting the conservation of high altitude wildlife species such as the snow leopard. In 2003, the Convention on Migratory Species included the snow leopard as a Concerted Action Species under its Appendix I. Similarly, in 2003, the Convention on International Trade in Endangered Species (CITES) expanded the scope of the CITES Tiger Enforcement Task Force to include all Asian big cat species including the snow leopard. In both cases, representatives of the MoEF played a vital role in elevating the conservation prominence of the snow leopard internationally. On-ground action to improve the conservation status of the snow leopard and other high altitude wildlife in India will be an appropriate follow-up to the positive actions already undertaken on international platforms the Government of India.

2.7. The region is important for the country's national security as well as international relations. Most of the Indian high altitude region fringes international borders. The welfare of local people through ecologically responsible development is therefore important for the country's national security. Furthermore, the wildlife value of the region makes the possibility of establishing international peace parks.

2.8. The region's aesthetic, historical, and cultural importance dates back several millennia. The region continues to inspire scholars, artists, poets, spiritualists, and the citizens at large. Today, the extent of tourism and pilgrimage is rapidly expanding, and while contributing to local

economies, also threatens the high altitude environment. There is both need and opportunity for promoting environmentally responsible, community-based tourism.

2.9. The high altitude wildlife in India today faces a variety of threats. The snow leopard, wolf, and other carnivores are widely persecuted in retaliation against livestock depredation[14]. Many mountain ungulate populations, important prey of these carnivores, are being depleted and lost due to competition with livestock, as well as hunting for meat. Seasonally migrating livestock herds, as well as livestock imported into the region for meat pose a serious risk of spreading exotic diseases to wildlife. Overstocking rangelands with livestock is causing vegetation degradation, which threatens the sustainability of pastoral production as well as the survival of wildlife populations[15]. There are increasing linkages between local persecution of wildlife and the larger illegal wildlife trade. Unplanned tourism threatens sensitive and biologically important high altitude wetlands. Although in many areas there has been substantial cultural tolerance for wildlife, this is fast eroding in the face of development and human-wildlife conflicts[16].

2.10. The existing high altitude protected areas in India require considerable strengthening. The protected area management in the Indian high altitudes often faces a lack of resources, manpower, and training. Some existing protected areas do not have a clear boundary demarcation, while some others have large areas within them that are of little biological value. Given the lack of options and alternatives for local communities in this harsh landscape, most of the protected areas are often intensively used for livestock grazing and other forms of resource extraction, even inside National Parks. The harsh, remote, and marginal landscape provides few opportunities for alternate livelihood sources for the local communities, and it is nearly impossible to create and maintain large, inviolate National Parks. Most protected areas in the region lack updated and effective management plans and, compared to the Tiger and Elephant reserves, have not received adequate conservation attention. Protected area management in the region needs to be rationalized with clear management plans and land use zonation, with greater technical and monetary resources being made available to wildlife managers.

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[14] *Mishra, C., Allen, P., McCarthy, T., Madhusudan, M. D., Bayarjargal, A., and Prins, H. H. T. 2003. The role of incentive programs in conserving the snow leopard. Conservation Biology 17: 1512-1520*

[15] *Mishra, C., Prins, H. H. T. and Van Wieren, S. E. 2001. Overstocking in the Trans-Himalayan rangelands of India. Environmental Conservation 28: 279-283*

[16] *Bhatnagar, Y. V., Wangchuk, R., Prins, H. H. T., Van Wieren, S. E., Mishra, C. 2006. Perceived conflicts between pastoralism and conservation of the kiang Equus kiang in the Ladakh Trans-Himalaya, India. Environmental Management. 38:934–941*

2.11. Wildlife management in the region needs to be made participatory. Given the widespread occurrence of wildlife on common land, and the continued traditional land use within protected areas, it is imperative that wildlife conservation efforts be made participatory both within and outside protected areas. Such a participatory approach will be facilitated by the relatively intact and functional traditional administrative bodies such as the village councils in most of the high altitude landscape. The success of recent experiments in participatory conservation underscores the desirability and feasibility of participatory wildlife management in the Indian high altitudes. These participatory approaches need to be coupled with better protection and law enforcement.

2.12. The Ministry of Environment and Forests, Government of India, constituted a committee to formulate the Project Snow Leopard (vide Notification - F. No. 15-5/2006 WL I, Dated 31 July 2006) in response to the recommendations of the national workshop (10-11 July 2006) organized jointly by the MoEF and the Jammu & Kashmir Department of Wildlife Protection, in technical collaboration with the Nature Conservation Foundation (NCF) and the International Snow Leopard Trust (ISLT)[17]. This workshop, chaired by the Union Minister for Environment and Forests, brought together representatives of all the five Himalayan states and scientists of the Wildlife Institute of India (WII), NCF, ISLT, and several other institutions and NGOs for discussions on the need, scope, and structure for the Project Snow Leopard. Prior to the national workshop, each of the five Himalayan states (Jammu & Kashmir, Himachal Pradesh, Uttaranchal, Sikkim and Arunachal Pradesh), led by their respective Chief Wildlife Wardens had independently articulated the need, scope, and strategies for conservation in the Himalayan high altitudes in state-level workshops organized by NCF in 2004-05 (see PSL 2006). The recommendations of the National Workshop on Project Snow Leopard are placed as Annexure 2.

[17] *PSL 2006. Towards Project Snow Leopard: report of the national workshop on Project Snow Leopard. 10th-11th July, 2006, Leh, Ladakh. Ministry of Environment and Forests, Govt. of India, Dept. of Wildlife Protection, J&, Nature Conservation Foundation, and International Snow Leopard Trust, Mysore, India.*

3 PROJECT OBJECTIVES

The goal of Project Snow Leopard is *to safeguard and conserve India's unique natural heritage of high altitude wildlife populations and their habitats by promoting conservation through participatory policies and actions.*

The high altitude Himalayan landscape in India is spread over c. 130,000 km^2 including c. 35 existing protected areas (c. 31,000 km^2). Given that this high altitude landscape is unique as the wildlife populations, though threatened, occur across the landscape and are not restricted to protected areas, an alternative, landscape-level conservation approach is needed. At the same time, this landscape continues to undergo traditional resource use in the form of livestock grazing and associated activities, and a participatory approach to conservation, that fully involves local communities, is urgently required. Keeping this broad philosophy in mind, the following are the objectives of the Project Snow Leopard:

3.1. Facilitate a landscape-level approach to wildlife conservation

Since wildlife populations in the Himalayan high altitudes are not restricted to protected areas, a landscape-level conservation approach is needed. The Project Snow Leopard will accordingly facilitate the identification of biologically important landscapes (> 1000 km^2), and assist in the development of landscape-level management plans based on management objective-setting (and zonation) for each landscape unit (10-100 km^2) therein (section 5).

3.2. Rationalize the existing protected area network and improve protected area management

Within the larger landscape, Project Snow Leopard will facilitate biologically and socially meaningful demarcation as well as zonation of existing protected areas and the surrounding landscape based on the landscape unit approach (Section 5), facilitate the establishment of new protected areas, the development of ecologically and socially responsible management plans, the development of frameworks for participatory conservation management, and provisioning of resources and capacity development of protected area staff.

3.3. Develop a framework for wildlife conservation outside protected areas and promote ecologically responsible development

Project Snow Leopard will facilitate initiatives required for preserving and promoting local peoples' tolerance towards wildlife, as well as support initiatives that promote the continued

persistence and recovery of wildlife populations on common land. Project Snow Leopard will assist in conservation-linked income generation and incentive programmes for local communities.

3.4. Support focused conservation and recovery programmes for endangered species such as the snow leopard and its prey species

Project Snow Leopard will encourage scientifically robust research (ecological and social), and the use of this knowledge for formulating and implementing participatory, science-based conservation programs at local and regional levels.

3.5. Promote stronger measures for wildlife protection and law enforcement

Project Snow Leopard will support initiatives that lead to enhanced capacity of wildlife department staff and local communities to effect stronger wildlife law enforcement through training, equipment, and innovative community-based protection measures.

3.6. Promote better understanding and management of human-wildlife conflicts

Project Snow Leopard will support ecological and social research leading to better local understanding of human-wildlife conflicts, and encourage the development of knowledge-

based frameworks that will allow for flexible and locally appropriate, community-based conflict resolution programmes that can be administered and managed by local bodies such as village councils.

3.7. Restore degraded landscapes in the high altitude Himalayan and Trans-Himalayan biogeographic regions

Project Snow Leopard will support efforts to design and implement restoration programmes in degraded areas that have restoration potential. Restoration projects whose need is adequately justified, and which are designed based on rigorous scientific research, would be supported.

3.8. Promote a knowledge-based approach to conservation and an adaptive framework for wildlife management

Project Snow Leopard will support and encourage high quality scientific research and monitoring of wildlife and human ecology, and enable management frameworks that are adaptive, periodically incorporating ecological and social feedback into management planning.

3.9. Reduce existing anthropogenic pressures on natural resources

Project Snow Leopard will support participatory programmes that aim at reducing human pressures on natural resources by provisioning of alternate income sources to local communities and value-addition to locally produced goods and services. Livestock grazing is prevalent in all protected areas of the region and forms an important source of livelihood for the people. Project Snow Leopard will support the formulation and implementation of appropriate grazing policies for both within and outside Protected Areas that will aim to harmonize the objectives of pastoralism with those of wildlife conservation.

3.10. Promote local capacity, conservation education and awareness

Project Snow Leopard will support education and awareness programmes for wildlife conservation targeted at local communities, children, as well as other human institutions including *Gram Sabhas*, EDCs, defence forces, road construction agencies, travel agents, etc. Project Snow Leopard will support programmes that aim to enhance the capacity of individuals and institutions from local communities in effecting wildlife conservation.

4 PROJECT AREAS

Project Snow Leopard is designed for all biologically important habitats within the snow leopard's range, irrespective of their ownership (e.g. Protected Areas, common land, etc.). Forming an estimated 1,29,000 km^2 within India, these areas generally comprise the non-forested or sparsely-forested high altitude regions of the Himalaya and Trans-Himalaya above elevations of c. 3,000 m in the Western Himalaya and above c. 4,000m in the eastern Himalaya. In each of the five Himalayan states, the proportion of area thus falling under the purview of the Project Snow Leopard is between 20 to 60% of the state's total geographical area (Table 1, Annexure 3). The project will place due emphasis on biologically important landscapes that fall outside the protected area network. Within this larger area, the project will support scientific surveys that will enable the identification and delineation of biologically important landscapes and landscape units.

State	Potential Area Under PSL (km^2)	Approximate percentage of each State's area falling under the Project	Approximate percentage of total Project Area covered by each State
Jammu & Kashmir*	77,833	61	60
Himachal Pradesh	27,846	50	22
Uttaranchal	13,885	23	11
Sikkim	3,031	36	2
Arunachal Pradesh	6,162	08	5
Total	**1,28,757**		

** Includes area within the LOC and the LAC*

Table 1: Geographical scope of the Project Snow Leopard in the five Himalayan states. The figures for the Western Himalaya include areas above 3000 m and those for the Eastern Himalaya are above 4,000 m. Estimates are based on Digital Elevation Model from Shuttle Radar Topography Mission (SRTM).

BROAD GEOGRAPHICAL SETTING WITHIN EACH STATE

Within each state, the potential project areas were tentatively identified in the state-level workshops (see PSL 2006). This information, summarized below, will be subsequently updated based on surveys conducted by each state.

Arunachal Pradesh

There is potential snow leopard habitat all along the northern boundary of Arunachal Pradesh at elevations above 4,000 m. Most of this area is yet to be surveyed. Some of the protected areas that may come within the purview of the project include the designated HH Tsangyang Gyatso World Peace Park (2520 km^2, Tawang and West Kameng districts, western Arunachal, located around the Se La range), areas in and around Namdapha National Park (1985 km^2, Changlang district, eastern Arunachal), Kamlang Wildlife Sanctuary (783 km^2, Lohit district, eastern Arunachal), Yordi Rabe Supse Wildlife Sanctuary (485 km^2, West Siang, central Arunachal), Mouling National Park (500 km^2, Upper Siang, central Arunachal) and the Dihang Dibang Biosphere Reserve (5120 km^2, West Siang, Upper Siang, and Dibang Valley, central Arunachal). However, most of these areas need to be surveyed and their biological appropriateness assessed for inclusion under Project Snow Leopard. Additionally, a considerable amount of as yet unsurveyed high-altitude area in-between these protected areas is expected to get included under this programme once surveys are undertaken.

Sikkim

Most of the areas above 4000 m in the state would get included. In the Trans-Himalayan region, these include all areas within the proposed Cold Desert Conservation Reserve, such as Lhonak Valley, Lashar Valley, Donkung – Tso Lhamo Plateau, Sebu La, Lava, Yume Samdong, Upper Thosa lake (source of Chakung Chu), and Nimphu. In the Greater Himalaya, this would include Khangchenzonga National Park including areas such as Kishong La, Green Lake, Lampokhri, Bikhma taar, Talung Glacier, Dudh Pokhri, Khang La in West Sikkim and Lampokhri (Jelepla) in East Sikkim.

Uttaranchal

Six districts in the state come under the purview of the Project Snow Leopard (areas above 3000 m). These are – Uttarkashi, Tehri, Rudraprayag, Chamoli, Pithoragarh and Bageshwar. Within these districts the existing Protected Area blocks will include Gangotri National Park including Nelong Valley, Gomukh, and Tapovan, Govind Wildlife Sanctuary and National Park, Kedarnath Musk Deer Sanctuary, Nanda Devi Biosphere Reserve, Pindari, Sunderdhunga, and Askot Wildlife Sanctuary. Other important corridor areas, not under PA network, but with potential for snow leopard and prey species include areas northwest of Govind Pashu Vihar towards Sangla Valley, Dayara-Gidara-Bhu complex, Sahastra Tal-Khatling-Masar Tal, Urgam-Khiron, Dasauli Block VIII, Nandakini I, Pinderpar IV Forest blocks (Badrinath Forest Division), and Gori River-Panchchuli-Chhiplakot stretch.

Himachal Pradesh

In Himachal Pradesh, the areas included under the scope of the Project Snow Leopard (above 3000 m) are Lahaul, Spiti, Pangi, Kinnaur, Upper Chamba (especially Bharmour), Upper Kangra (Bara Bhangal), Upper Kullu (Mantalai, Pin Parvati, upper Great Himalayan NP, upper Manali), and Upper Simla (Rupi Bhabha, Dodra Kwar).

Jammu & Kashmir

The geographical scope of the Project Snow Leopard (areas above 3000 m) would include the whole of Ladakh, Zanskar, and Karakoram. Surveys are needed in other parts to examine their potential, such as, Pir Panjal, including Poonch, Rajouri –Doda district, Banni-Sarthal area, Bhaderwah Bhalessa, ranges up to Himachal Pradesh border, Sonmarg/ Thajwas Wildlife Sanctuary, Amarnath caves area, Margan Pass, proposed extension areas of Dachigam, Pandras, Dras, Chiktan, Shakar Chiktan, Fotu La, and Overa Wildlife Sanctuary.

CRITERIA FOR DETERMINING LANDSCAPES

Project Snow Leopard, at its initiation, will support the development of survey frameworks that will enable scientific surveys, identification and delineation of biologically important landscapes and landscape units for conservation. The frameworks will be developed jointly by scientific institutions such as the NCF and WII, and the surveys will be undertaken and facilitated by the state wildlife departments both within and outside the existing protected areas, and will include inventorying of wildlife populations, habitat status, connectivity, threats, human-wildlife conflicts, socio-economic dependence, and an assessment of long-term conservation potential. **Each state will select one biologically important site and develop a science-based, participatory conservation programme in that site in the first five years of Project Snow Leopard.** This will be subsequently expanded to include other biologically important sites.

5 BROAD MANAGEMENT PRINCIPLES

Given the unique values and conditions of wildlife occurrence and human use in the vast proposed project area, a landscape level planning approach that incorporates clear and scientific land use planning, including zonation is extremely important. The approach has to be one that works on landscape level plans and localized management. Key elements of this include co-management of resources using scientific, participatory and adaptive management approaches. While the development of detailed management plans for biologically important landscapes would be supported by the project, a broad guiding management framework is outlined below[18].

The first step would be to identify and demarcate biologically important landscapes (generally large spatial scales; > 1000 km^2), and setting the management objectives for each landscape unit (smaller spatial scales; c. 10-100 km^2) within the larger landscape, based on its relative importance for wildlife conservation and human use. Each landscape unit may be demarcated based on a combination of geological, ecological, and administrative characteristics. Such an exercise needs to be undertaken within as well as outside the existing protected areas, and on both government and community-owned lands. To the extent possible, the objective should be to maximize the size and number of 'core' landscape units that are maintained as inviolate, interspersed among a series of 'buffer' landscape units. The 'buffer' landscape units may have a variable set of multiple-use objectives, particularly in areas where local communities have traditional rights or practices. The guiding principles underlying the management objectives for wildlife populations for this mosaic of landscape units can be as follows:

(i) In core landscape units, management objectives should aim to maintain wildlife populations (N_c) at carrying capacity (K) over the long-term, enable conditions where birth rates (b_c) exceed rates of mortality (m_c), and rates of emigration (e_c) are considerably higher than immigration rates (i_c) to enable spill-over effects, i.e., $N_c \approx K$, $b_c > m_c$, and $e_c >> i_c$

(ii) For each buffer landscape unit, the desirable wildlife population size (N_b)will be a function of the trade-off between conservation and human use objectives and the wildlife populations would be maintained such that: $N_b = K - f(A)$, and $b_b + i_b \geq m_b + e_b$ where f(A) is a function by which the wildlife population size is reduced below carrying capacity as a result of an acceptable level of human anthropogenic pressure for each landscape unit.

[18] *Mishra, C., Bagchi, S., Namgail, T., and Bhatnagar, Y.V. Wildlife in Trans-Himalayan rangelands: conservation conflicts and challenges. To be published in: DuToit, J., Kok, R., and Deutsch, J. (Eds.) Can rangelands be wildlands?: wildlife and livestock in semi-arid ecosystems. Conservation Science and Practice Series, Blackwell Publishing.*

The size and number of core landscape units, wherever feasible, should be large, and adequately interspersed within a matrix of buffer landscape units to enable the conservation of viable wildlife populations (Figure 2). At a minimum, the coupled landscape-level guiding principle for core and buffer units would be to aim for the total spill-over from core units to at least off-set the net individuals lost from buffer units due to mortality and emigration, i.e.: $\sum N_c (e_c - i_c) \geq \sum N_b (b_b - m_b - e_b)$. It is recognized that the data and information required for effective management can only be generated over time, and it is emphasized that this is a broad ecological framework for guiding conservation management under Project Snow Leopard.

Within this hierarchical landscape level management, it is important to include the local communities in management planning and implementation at appropriate scales. Most local communities, in particular traditional village councils, would be important stakeholders at the level of individual landscape units, while larger bodies such as the Panchayat may be involved at the level of a set of adjacent landscape units (see Section 7). The micro-plans for management of each landscape unit would then be integrated into a hierarchical, landscape level management plan.

The importance of constantly generating scientific knowledge on wildlife ecology and human society is particularly underscored in this management framework. It is also critical that an adaptive framework for wildlife management be followed, that actively supports research and monitoring, and constantly incorporates ecological and social feed-backs into management planning at the landscape and landscape unit levels. Mainstreaming biodiversity concerns in development and convergence of works by different stakeholders will also be important for the ultimate success of the programme. In addition to ecological and socio-economic monitoring to assess management performance, the changes in attitudes of people and the extent of threat reduction brought about by the programme will also be important indicators of programme success.

At all levels of implementation, there will be emphasis on operational and financial transparency, proper monitoring and course corrections. Civil works and construction works will generally not be supported unless deemed and proven to be essential for success of critical programme initiatives. At all levels of administration and implementation, strong focus will be maintained on capacity enhancement, particularly of the local communities. Emphasis throughout will also be placed on constant generation and advancement of scientific knowledge and its incorporation into management frameworks. It is recognized that conservation issues and needs as well as opportunities are highly variable spatially and temporally, and to the extent possible, flexibility will be ensured to develop as well as constantly adapt locally appropriate conservation initiatives. Financially sustainable conservation measures such as, for instance, community-based livestock

insurance programmes for off-setting carnivore-caused damage to livestock[19], will be preferred over less sustainable measures such as compensation programmes.

During the first five years of the Project Snow Leopard, the objective will be to create one model landscape-level conservation programme in each state. Each state will, based on wildlife values and conservation needs and potentials, select one biologically important landscape. In the first one to two years, a detailed landscape level management plan will be developed or an existing one adapted based on the management planning guidelines to be provided under the Project Snow Leopard, and local management bodies will be identified and organized (see Section 7). The management plan will then be implemented, and at the end of five years, based on a detailed work audit, the future course of action will be decided. More landscapes will be brought under the Project Snow Leopard after the first five years.

Specific approaches guiding the Project Snow Leopard are outlined below.

5.1. MANAGEMENT APPROACH

5.1.1 Responsible and careful management Use of scientifically rigorous research on wildlife ecology and human society, use of traditional local knowledge, wisdom, and manpower; Site-specific management approaches integrated at the landscape level.

5.1.2 Landscape-level approach to management, especially because significant wildlife populations occur outside Protected Areas.

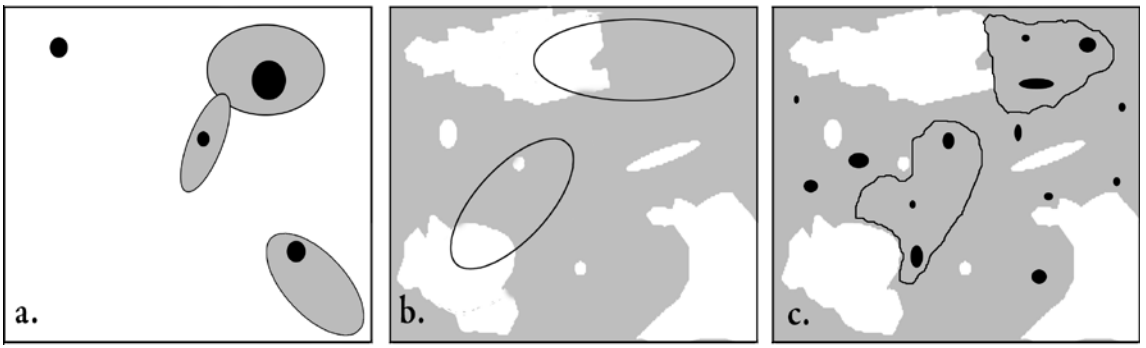
5.1.3 Involvement of communities in conservation efforts. In addition to the direct involvement of village councils and panchayats, wherever possible, obtaining the support of religious institutions and other local bodies in strengthening conservation.

5.1.4 Development of conservation incentives for local communities

[19] *Mishra, C., Allen, P., McCarthy, T., Madhusudan, M. D., Bayarjargal, A., and Prins, H. H. T. 2003. The role of incentive programs in conserving the snow leopard. Conservation Biology 17: 1512-1520*

5.1.5 Science-based management of wildlife and their habitats

Figure 2. *A schematic representation of wildlife management0 under Project Snow Leopard. (a) The majority of India's terrestrial landscapes, where wildlife persists largely in insular protected areas, are further divided into core (no anthroprogenic use; dark areas in the figure) and buffer zones (regulated anthropogenic use; grey in figure), surrounded by rural and urban landscapes (white). (b) in the Himalayan and Trans-Himalayan altitudes there are very few 'core' areas, but often-depleted wildlife populations persit across the entire landscape except high peaks, permafrost areas (irregular white) and larger human settlements (white circles). (c) A more effective framework in the higher Himalayan and Trans-Himalayan region would be to follow a landcape-level approach where each landscape unit is either a core unit or a buffer unit with specific multiple-use objectives, within and outside Protected Areas. Te protected Area boundaries themselves will need to exclude biologically unimportant areas particularly from the existing 'core zones'. In case access to a peak is through ecologicly sensitive zones, these peaks (white areas) should be kept within the protected area to safegaurd conservation concerns.*



5.2. MANAGEMENT INITIATIVES

5.2.1 Enhanced management in Project Areas

a. Research-based identification of important landscapes and landscape units.
b. Proper zonation of the protected areas and the larger landscape based on wildlife value, status of populations and habitats and use by people.
c. Appropriate and spatially hierarchical management planning.

5.2.2. Alternate sources of income for local communities

a. Support alternative income generation activities for people dependent on local resources to reduce their dependence on these resources and/ or for garnering their support for conservation. Wherever needed provide targeted capacity building or enhancement of the local population.

b. Encourage community-based and environmentally responsible tourism.

c. Facilitate the development of policies for tourism and mountaineering regulation, including possibilities of charging environmental fees which can be directed for local conservation efforts.

5.2.3. Effective protection

a. Developing good intelligence networks and involving local participation in protection through Community Protection Forces.

b. Strengthen the capacity of local forest/wildlife staff in terms of their numbers, training and equipment.

c. Encourage local GREF and military establishments in self regulation regarding illegal hunting.

d. Manage labour camps in wildlife areas to curb poaching.

5.2.4. Formulate alpine pasture/rangeland management strategies

a. Support focused research and experimental studies to understand pastoral production, optimal stocking densities, pasture improvement, etc.

b. Develop and implement strategies to understand and control potential disease transfers between livestock and wildlife.

c. Study the ecological impacts of local resource use on wildlife and develop strategies to minimize adverse ecological impacts.

d. Implement the findings of above programmes through adaptive management.

5.2.5. Develop comprehensive conflict mitigation strategies for livestock and crop depredation. Support locally appropriate, community-managed conflict mitigation strategies that are based on sound research and are locally appropriate.

5.2.6. Capacity development/enhancement of staff in wildlife management. Specialized training in participatory planning and action, wildlife monitoring, mountaineering, tourism management, wildlife laws etc needs to be instituted for all levels of the wildlife/forest departments.

5.2.7. Encourage research on wildlife ecology and human society. Support scientifically well-designed research projects by reputed governmental and non-governmental research institutions.

5.2.8. Convergence of biodiversity concerns and development. Institute mechanisms for coordination between relevant Government departments and NGOs to encourage environmentally-responsible development that safeguards the interests of conservation.

5.2.9. Staff welfare and financial strategies

a. Economic and other service benefits to staff working in the Project Snow Leopard areas
b. Funding based on a long term management plan in partnership with conservation research agencies and NGOs
c. Preference for young and committed staff to be posted in the high altitude areas.

Wherever applicable, have fixed tenures for staff and a 'lighter' posting after tenure at high altitudes.

5.3. STRATEGY FOR REACHING OUT

5.3.1. Education and awareness programs regarding wildlife conservation targeted at local communities as well as policy makers – includes local community, rural schools, Gram Sabhas, EDCs, defence forces, travel agents, etc.

a. Sensitization of defence forces posted in the region through effective and continuing conservation education programmes (preferably during the acclimatization period). Use their existing programmes such as 'Sadbhavna' to aid in conservation and offsetting their adverse impacts on wildlife and natural resources.
b. Better awareness through gram sabha, EDCs, etc. to counter traditional hunting practices prevalent in some regions.
c. Promoting conservation education through zoos, wherever appropriate.

5.4. RESEARCH

Reliable information on ecology and human society is a cornerstone of effective wildlife management. Numerous aspects such as wildlife occurrence, biodiversity status, grazing management, pasture development, disease transfers, conflicts, have been identified in earlier sections where such information is urgently needed to guide management. The strategies thus outlined for information generation are as follows:

5.4.1. Scientific information from the project area is limited, although there have been recent advances in knowledge about various aspects of ecology and society through the efforts of governmental, non-governmental organizations and some universities. As pointed out in the Objectives and Activities above, the Project Snow Leopard will facilitate constant advancement of scientific knowledge on wildlife ecology and human society.

5.4.2. Project Snow Leopard will actively support research on distribution, status and population dynamics of wildlife, threats, grazing management, pasture development, disease transfers, human-wildlife conflicts, applied research for species recovery programmes, use of advanced techniques to monitor snow leopards and other wildlife that include the use of genetics and camera trapping. Organizations such as the Wildlife Institute of India, Dehradun, the Nature Conservation Foundation, Mysore and the GB Pant Institute of Himalayan Environment & Development, Almora, have considerable expertise on issues of the higher altitude ecosystems. Organizations such as WII, Dehradun, and the National Centre for Biological Sciences (NCBS), Bangalore also have existing genetics laboratories.

6 INDICATIVE ACTIVITIES UNDER PROJECT

Based on the objectives, the following activities for the project have been identified, along with their budgetary allocation. The same information is available in the Flowchart in Figure 3.

Objective	Key Activities	Proportion of budget (%)
1. Facilitate a landscape-level approach to wildlife conservation	**1.1** Develop scientific frameworks for comprehensive surveys to identify biologically important landscapes and landscape units, associated socio-economy and human-wildlife relationships.	10%
	1.2 Based on scientific surveys, identify important landscapes (including but not restricted to protected areas)	
	1.3 Plan landscape zonation within and outside protected areas based on wildlife values, conservation potential, alternate land use requirements, and conservation prioritization of each landscape unit	
	1.4 Identify important stakeholder groups for each landscape and landscape unit	
	1.5 Develop management planning guidelines that promote integrated landscape-level as well as localized management strategies	
	1.6 Based on the above, develop biologically and socially relevant landscape-level management plans that set out both site-specific (each landscape unit) as well as integrated (landscape-level) objectives, participatory strategies and management activities	

Objective	Key Activities	Proportion of budget (%)
2. Rationalize the existing protected area network and improve protected area management	2.1 Plan and establish biologically and socially meaningful demarcation and zonation of existing protected areas	9%
	2.2 Establish new protected areas, and develop ecologically and socially responsible landscape level management plans, as outlined above	
	2.3 Support greater involvement of local people in protected area management through people friendly activities	
	2.4 Provide greater resources to and capacity development for protected area managers and staff, and provide economic and other staff-welfare incentives for high altitude postings	
3. Develop a framework for wildlife conservation outside protected areas and promote ecologically responsible development	3.1 Facilitate the continued persistence and recovery of wildlife populations on common lands by developing ways of preserving and promoting peoples' tolerance towards wildlife.	15%
	3.2 Identify means and provide development assistance that will promote ecologically responsible development in the larger landscape in accordance with the landscape-level zonation outlined above.	
	3.3 Encourage mechanisms that will support the mainstreaming of biodiversity and wildlife concerns in developmental projects.	
	3.4 Support incentive programmes such as community managed wildlife tourism, value addition to local handicrafts, etc. that promote local peoples' involvement and support for conservation through appropriate economic and other incentives, as well as community support programmes in healthcare and education.	
	3.5 Support necessary research and development of grazing policies that aim to harmonize the objectives of pastoral production with those of wildlife conservation	

Objective	Key Activities	Proportion of budget (%)
4. Encourage focused conservation and recovery programmes for endangered species such as the snow leopard	4.1 Support fundamental and applied research on wild species and ecosystems, human ecology, local human institutions, resource use and socio-economy, and human-wildlife conflicts	8%
	4.2 Use this knowledge for formulating and implementing participatory conservation programs	
5. Promote stronger measures for wildlife protection and law enforcement	5.1 Increase the capacity of wildlife management staff in protection through provisioning of adequate staff strength, training and equipment	15%
	5.2 Support the involvement of local community representatives in protection through Community Wildlife Protection Forces and payment of wages for services rendered.	
	5.3 Initiate joint activities with the army and Border Roads Organization to curtail hunting	
	5.4 Establish protection camps in vulnerable areas	
	5.5 Develop and support local intelligence networks	
6. Promote better understanding and management of human-wildlife conflict	6.1 Support ecological and social research and documentation of traditional knowledge to promote the understanding of human-wildlife conflicts	11%
	6.2 Provide a framework and resources for flexible and locally appropriate community-based conflict resolution programmes that allow for constant monitoring of conflict resolution programmes and periodic course-corrections	
7. Restore degraded landscapes	7.1 Support ecological research on vegetation and wildlife restoration potential of degraded sites and laying out site-specific restoration objectives	7%
	7.2 Support scientifically well-informed restoration and species-recovery programmes	

Objective	Key Activities	Proportion of budget (%)
8. Promote a knowledge-based approach to conservation and an adaptive framework for wildlife management	8.1 Provide a framework that recognizes the importance of scientific knowledge in guiding conservation at all steps, including setting out objectives, deciding on the most appropriate management strategies, and monitoring of conservation actions	8%
	8.2 Support and facilitate fundamental and applied scientific research by governmental and non-governmental research institutions on wildlife and ecosystem ecology, taxonomy, landscape ecology, human ecology, and human-wildlife conflicts	
	8.3 Develop frameworks for wildlife management that periodically incorporates ecological and social feedback into management planning	
9. Reduce existing anthropogenic pressures on natural resources	9.1 Support participatory programmes that aim at reducing human pressures on natural resources by provisioning of alternate income sources and value-addition to goods and services	10%
10. Promote conservation education and awareness	10.1 Support education and awareness programs regarding wildlife conservation targeted at local communities, children, as well as other human institutions including Gram Sabhas, EDCs, defence forces, travel agents, etc.	7%
	10.2 Promote programmes to sensitize defence forces posted in the high altitudes through effective and continued conservation education programmes	

Figure 3: Outline of the project objectives and activities, along with the suggested budgetary allocation. The interrelationship between activities is also indicated.

7 ADMINISTRATION

National-level: At the MoEF, a national steering committee with representation of MoEF officials, Governmental and Non-governmental research institutions, and the Forest Departments of Jammu & Kashmir, Himachal Pradesh, Uttaranchal, Sikkim and Arunachal Pradesh, will co-ordinate the Project Snow Leopard. For the initial period of five years, the existing drafting committee will function as the national steering committee and the executive body of the Project Snow Leopard. This body may also identify and invite a qualified scientist specializing in human ecology/ sociology/ tribal affairs to be a part of the steering committee. The steering committee will be responsible for general direction setting, overseeing, funds generation and disbursement, and facilitating periodic monitoring and evaluation of the Project Snow Leopard. The steering committee will also ensure transparency and periodic information dissemination pertaining to the programme at a national level. The steering committee will also administer a small grants programme aimed at enabling the direct participation of community based organizations, NGOs, and research and conservation institutions in effecting research and conservation initiatives and capacity enhancement particularly at the local community-level.

The Nature Conservation Foundation and the Wildlife Institute of India will respectively be the primary non-governmental and governmental institutions providing constant technical support and advice to the national steering committee and the states. At the initiation of the Programme, they will jointly work to develop guidelines and frameworks for landscape-level, knowledge-based and participatory management planning as outlined in section 5 & 6 above.

State-level: At the state-level, the Chief Wildlife Warden will set up a State Snow Leopard Conservation Society for this purpose, including senior forest officers managing snow leopard landscapes, other relevant governmental departments such as tourism and animal husbandry, the army and paramilitary forces, representatives of NGOs active at the state-level, and community-based organizations. The Society may also seek the advice, support, participation and assistance of reputed individuals and institutions that it believes can provide scientific and technical expertise. The Society, chaired by the Chief Wildlife Warden, and represented by diverse stakeholders such as other government departments and community based organizations, scientists and conservationists, will provide greater focus and thrust to the programme, as well as enable the states to raise additional funds for wildlife conservation in the snow leopard landscapes. This

Society will be the primary body responsible for implementation of the Project Snow Leopard at the state-level. It will send consolidated proposals and annual budgets and obtain funds from the national steering committee and provide it to the landscape-level management committees (see below). The Society will also be responsible for ensuring transparency and information sharing regarding the programme at the state-level, as well as get periodic financial and work audits by appropriate and reputed research bodies or committees. Once in five years, the Society will facilitate a work audit by the national steering committee or any other body designated by the latter for this purpose.

Each State Snow Leopard Conservation Society will designate landscape-level implementation committees with representation of serving officers (CF/DCF level) from the various wings of the Forest Departments, other appropriate governmental departments including the relevant senior officials of District Administration, locally active NGOs, a single representative of tourism operators, community-based organizations and the member secretary of each of the local village-level committees nominated by the Village councils/ Gram Sabhas (that are important stakeholders at the landscape-unit level; see below). The committee will be headed by a senior officer of the Forest Department (CF/DCF). It is recognized that the role of local NGOs, and community-based organizations including religious bodies is extremely important for effecting Programme activities, and these must be given adequate representation in the landscape-level committees. These committees will assist in the development of integrated landscape-level management plans based on the landscape-level management planning guidelines mentioned above. The committees will be responsible for implementation of landscape-level conservation activities, mobilizing and capacity enhancement of village/ landscape unit-level bodies (see later) and in formally organizing them in case they are traditional and informal village management bodies, selection and training of community-protection forces, and for overseeing, facilitating and monitoring the conservation activities and management programmes at the community/ village/ landscape unit-level. Where the landscape is large and jurisdictionally divided between different wings of the Forest Department, more than one implementation committee may be designated. These committees will also serve as the link between village/landscape unit-level bodies and the State Snow Leopard Conservation Society. The committees will collate and submit annual work and financial reports to the Society, as well as provide annual work proposals and budget estimates.

It is recognized that over most of the snow leopard landscape within India, the local communities have a near pervasive presence and are amongst the most important conservation stakeholders. It is also recognized that considerable village and land use administration and decision-making in this landscape is the responsibility of traditional and democratic, albeit informal, village councils. In all areas where local human communities have a presence, traditional rights or resource use access, these hitherto informal village councils or the gram sabha becomes one of the primary

institutions, alongside the Forest Department, for planning and implementation of the Project Snow Leopard at the landscape unit level. The village councils/gram sabhas, together with the Forest Department, will constitute village-level management and implementation bodies, to be called Village Wildlife Conservation Committees, for implementation of the Project Snow Leopard activities. Facilitating the capacity development of these village-level committees, including assistance in formally organizing them, training in accounting and book-keeping etc. will be the responsibility of the landscape-level committees. One front-line Forest Department staff will be represented in these village committees. The village council/ Gram Sabha may choose to either take on the responsibilities of the committee itself, or designate any existing village-based institution (such as youth clubs) for this purpose. One member from each family in the village will have the option of becoming a member of such a body, which will also ensure the equitable representation of existing classes and gender. Where the village size is very small (< 10 families), the village council/Gram Sabha may, together with the Forest Department, decide to have a combined Village Wildlife Conservation Committee with one or more neighbouring villages. On the other hand, if the quality and area of wildlife habitat within the resource use catchment of the village is relatively high, independent village committees may be desirable even in small- sized villages. The Village Council/ Gram Sabha will designate either a Panchayat member or any other collectively chosen suitable person from the village as a member secretary of this body.

All landscape unit-level wildlife conservation and community-based management initiatives will be undertaken and implemented by the Village Wildlife Conservation Committees and their capacity enhancement will be one of the primary responsibilities of the larger landscape-level committee. The committees will participate integrally in developing landscape unit-level management micro-plans. The work of the Village Wildlife Conservation Committee will include but need not be restricted to community-based management of human-wildlife conflicts, incentive and alternate income generation programmes, setting up of small 'core' areas on traditionally used rangelands with community participation (see section 5), participation in monitoring programmes for wildlife habitats, populations and human socio-economy, and nomination of suitable members for community protection forces. It is recognized that a different approach will be needed in the case of nomadic pastoralism, as well as in the few areas where high altitude landscapes are habitation free but people in the lower altitude villages use the higher altitude landscape for certain kinds of natural resource extraction.

PSL Body	Constituents
National	
Project Snow Leopard National Steering Committee	MoEF officials, Governmental and Non-governmental research institutions, and the Forest/Wildlife Departments of five Himalayan states. Qualified scientist specializing in human ecology/ sociology/ tribal affairs to be a part of the steering committee. (For the first 5 years this the PSL drafting committee will serve as the steering committee)
State	
State Snow Leopard Conservation Society	Chaired by the Chief Wildlife Warden, including senior forest officers managing snow leopard landscapes, other relevant governmental departments such as tourism and animal husbandry, the army and paramilitary forces, representatives of NGOs active at the state-level, and community-based organizations. The Society may also seek the advice, support, participation and assistance of reputed individuals and institutions that it believes can provide scientific and technical expertise
Landscape	
Landscape-Level Implementation Committees	Field officers (CF/DCF level) from the appropriate wings of the Forest Departments, other appropriate governmental departments including the relevant senior officials of District Administration, locally active NGOs, a single representative of tourism operators, community-based organizations and the member secretary of each of the local village-level committees nominated by the Village councils/ Gram Sabhas. Local leaders may be special invitees for the meetings as seen appropriate
Village /Village Cluster	
Village Wildlife Conservation Committee	Traditional village councils/gram sabhas, frontline Forest Department staff representative

8 FINANCIAL IMPLICATIONS

Project Snow Leopard will be treated at par with other flagship species programmes of the country such as the Project Elephant. The MoEF will allocate for the Project Snow Leopard, at least 3% of the total funds sought from the Planning Commission. At the initiation of the Project Snow Leopard, the Project Snow Leopard National Steering Committee will prioritize activities (see Section 6) for funding and suggested budgetary allocations. Tentative figures for the objective wise allocations are given below (The details of the activities can be found in Section 6 and Figure 3):

Summary of Cost Estimates:

Objectives	*% Funding*
1. Facilitate a landscape-level approach to wildlife conservation	10
2. Rationalize the existing protected area network and improving protected area management	9
3. Develop a framework for wildlife conservation outside protected areas and promoting ecologically responsible development	15
4. Encourage focused conservation and recovery programs for endangered species such as the snow leopard	8
5. Promote stronger measures for wildlife protection and law enforcement	15
6. Promote better understanding and management of human-wildlife conflict	11
7. Restore degraded landscapes	7
8. Promote a knowledge-based approach to conservation and an adaptive framework for wildlife management	8
9. Reduce existing anthropogenic pressures on natural resources	10
10. Promote conservation education and awareness	7
Total allocation 3 % of total financial outlay	**100**

9 CONCLUSION

Project Snow Leopard, a national programme for conservation of high altitude Himalayan wildlife, will address a very important and urgent need to promote conservation efforts this biologically, socially, and nationally significant landscape. Project Snow Leopard, by focusing on one biologically important landscape in the first five years in each state, aims to demonstrate on-ground conservation in a time-bound manner, and, at the same time, to draw lessons from successes and limitations of the initial effort to enable better informed programmes in the other sites to be undertaken in the next phase. With its inclusive and participatory approach to conservation that fully involves local communities, conservationists, conservation scientists, and the civil society, its approach of local involvement on the one hand and strong protection on the other, and its strong emphasis on rigorous science and monitoring, Project Snow Leopard aims to set up model conservation programmes which would achieve wildlife conservation alongside broad-based public support for conservation.

10 TIME-LINES

Sr. No.	Activity	Pre-project	Year 1	Year 2	Year 3	Year 4	Year 5
		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
1	**Pre-project activities**						
	Notification of the National Steering Committee						
	Formation of State Snow Leopard Conservation Societies						
	Identification of one PSL site in each state						
	Formation of landscape-level Implementation Committees						
	Formation of Village Wildlife Conservation Committee						
2	**Develop management planning guidelines**						
3	**Surveys for data collection for management planning**						
4	**Management Planning process**						
5	**Implementation of management plans**						
6	**Small grants programme**						
	Develop guidelines						
	Implement small grants programme						

11 ANNEXURES

ANNEXURE-1:

Details of the Project Snow Leopard, Drafting Committee instituted by the Ministry of Environment and Forests, Government of India, (vide Notification No. F.No., 15-5/2006 WL I, Dated 31 July 2006)

Sr. No	Name & Designation	Membership
1	Additional Director General (Wildlife)	Chairman
2	Director, Wildlife Institute of India, Dehradun	Member
3	Chief Wildlife Warden, Jammu & Kashmir	Member
4	Chief Wildlife Warden, Himachal Pradesh	Member
5	Chief Wildlife Warden, Uttarakhand	Member
6	Chief Wildlife Warden, Sikkim	Member
7	Chief Wildlife Warden, Arunachal Pradesh	Member
8	Inspector General of Forests (WL)	Member
9	Dr. V.B. Mathur, Dean, Wildlife Institute of India, Dehradun	Member
10	Dr. Charudutt Mishra, Executive Director, Nature Conservation Foundation	Member
11	Dr. Yash Veer Bhatnagar, Senior Scientist, Nature Conservation Foundation	Member
12	Dr. C.M. Seth, Director, SFRI, Jammu & Kashmir	Member
13	Inspector General of Forests and Director, Project Elephant	Member Secretary

ANNEXURE 2:

Recommendations of the National Workshop on 'Project Snow Leopard (PSL)' held on 11-12 July, 2006 at Leh-Ladakh

i. The high altitudes of India (> 3000 m, c. 250,000 km2, including the Himalaya and Trans-Himalaya biogeographic zones) support a unique wildlife assemblage of global importance, which needs to be conserved through a focused strategy and action plan under the Project Snow Leopard (PSL).

ii. PSL will promote wildlife conservation through a participatory process by fully involving the local communities in conservation efforts, and seeking their active participation in conservation through appropriate incentives.

iii. As a significant proportion of Himalayan high altitude wildlife occurs outside Protected Areas, PSL will follow a landscape level approach that gives due importance to conserva tion both within and outside Protected Areas.

iv. PSL will strengthen and enhance the capacity of state forest and wildlife departments in effectively managing high altitude wildlife through provisioning of manpower, resources, incentives, and capacity building.

v. PSL will be formulated in line with the National Wildlife Action Plan (2001-2016), and will incorporate the salient features articulated in the state-level PSL workshops and the Snow Leopard Survival Strategy, and in addition, draw lessons from the experiences of other flagship species programmes such as the Project Tiger and Project Elephant.

vi. PSL will support research on wildlife and human dimensions throughout the high alti tude areas of the snow leopard range states of India.

vii. PSL will encourage an adaptive management framework which will provide for constant monitoring of wildlife populations and human socio-economy, and for periodic course-corrections in management actions.

viii. As the high altitudes also represent a vast rangeland system, PSL will assist the states in the development of grazing policies and management practices that will aim to harmonize the objectives of pastoral interests with those of wildlife conservation.

ix. PSL will promote research-based species recovery programmes.

x. PSL will promote community-based management programmes for resolving human-wildlife conflicts.

xi. PSL will promote conservation education and awareness initiatives.

xii. Given that most of India's high altitude wildlife habitats are along international boundar ies, PSL recognizes the importance of co-opting the armed and para-military forces in conservation efforts, and exploring possibilities for trans-boundary conservation efforts.

xiii. The MoEF will constitute a committee comprising of the participating states and other key stakeholders for the drafting of the PSL strategy and action plan.

ANNEXURE 3:

Known protected areas in the Indian high altitudes (including the Trans-Himalaya and Greater Himalaya) with potential for snow leopard occurrence (Rodgers et al. 2000, WII Database and inputs from the respective Forest/Wildlife Departments).

ANNEXURE 4:

List of PAs in the Five Himalayan States. PAs in the snow leopard range are seperately identified (based on WII Database and inputs from state Forest/Wildlife Departments)

Sr.No.	State	Name of NP & WLS	Year of Estb.	District	Biog. Zone	Biog. Province	High Altitude Snow Leopard Area	Suggested SI Reserve	Area (sq km.)	Location (Latitude)	Location (Longitude)	Altitudinal Range	Climate, Topography & Broad Vegetation	Status of Management Plan	PA Management status & Present land use
1	J&K	Baltal-Thajwas WLS	1987	Srinagar	2	02A	Part		210.5	34.13	74.23	NA	?	NA	NA
2	J&K	Changthang Cold Desert WLS	1987	Leh	1	01B	Entire	Yes	4000	32.44.30 to 34.11.97	78.43.33 to 80.49.10	NA	AAP, ADS	NA	NA
3	J&K	City Forest (Salim Ali) NP	1992	Srinagar	2	02A	No		9	34.04	74.52.08 to 74.54.37	NA	?	NA	NA
4	J&K	Dachigam NP	1981	Srinagar/Pulwama	2	02A	Part	Yes	171.25	34.05	74.28	1642-4289	HMT, HDT, SAF, AAP	NA	NA
5	J&K	Gulmarg WLS	1987	Baramulla	2	02A	Part	Yes	139.25	34.05	74.25	2400-4300	SAF, AMS	NA	NA
6	J&K	Hemis NP	1981	Leh	1	01A	Entire	Yes	3350	33.38 to 34.11	77.00 to 77.44	3300-6400	AAP, AMS, ADS	NA	NA
7	J&K	Hirapora WLS	1987	Baramulla	2	02A	Small part		114.5	33.35 to 33.40	74.35	2557-4745	?	NA	NA
8	J&K	Hokersar WLS	1992	Srinagar	2	02A	No		13.75	34.05	74.43	1584	AMS, SAF	NA	NA
9	J&K	Jasrota WLS	1987	Kathua	4	04A	No		25.75	32.26.52 to 32.30.20	75.20.57 to 27.75.25	300-350	HDT	NA	NA
10	J&K	Karakoram (Nubra Shyok) WLS	1987	Leh	1	01A	Entire	Yes	5000	34.29.22 to 35.12.26	77.15.74 to 77.05.25	NA	?	NA	NA
11	J&K	Kishtwar NP	1981	Doda	2	02A	Part		400	33.20 to 34.00	75.40 to 76.10	1700-7135	HDT, SPF, SAF, ADS	NA	NA
12	J&K	Lachipora WLS	1987	Baramulla	2	02A	Part	Yes	93.5	34.13	74.08	1630-3300	?	NA	NA
13	J&K	Limber WLS	1987	Baramulla	2	02A	Part	Yes	43.75	34.09	74.09	NA	?	NA	NA
14	J&K	Nandini WLS	1981	Jammu	4	04A	No		44.25	32.50 to 32.55	74.55 to 75.00	NA	SPF, HDT	NA	NA
15	J&K	Overa-Aru WLS	1987	Anantnag	2	02A	Part	Yes	511	33.55 to 34.15	75.05 to 75.22	2150-5425	HDT, SAF, SPF	NA	NA
16	J&K	Rajparian WLS	?	Anantnag	2	02A	No		20	NA	NA	NA	?	NA	NA
17	J&K	Ramnagar Rakha WLS	1981	Jammu	4	04A	No		12.75	NA	NA	430-611	SDE, SPF	NA	NA
18	J&K	Surinsar Mansar WLS	1981	Jammu	4	04A	No		55.5	32.41.29 to 32.49.28	74.59.54 to 75.09.12	400-650	HDT, HDS, SAF	NA	NA
19	J&K	Trikuta WLS	1981	Jammu	2	02A	No		27.75	NA	NA	450-600	SPF	NA	NA
20	HP	Bandli WLS	1962	Mandi	2	02A	Entire		41	31.25.21 to 31.29.02	76.52.04 to 76.56.54	762-2160	HMT, SPF	NA	NA
21	HP	Chail WLS	1976	Solan	2	02B	No		109	30.53.36 to 31.00.42	77.07.20 to 77.16.44	701-2408	HMT, SPF	NA	NA
22	HP	Churdhar WLS	1985	Sirmaur	2	02B	No		66	30.48.37 to 30.54.39	77.23.32 to 77.29.49	2000-3647	AMS, HMT	NA	NA
23	HP	Daranghati WLS	1962	Shimla	2	02B	No		167	31.22 to 31.28	77.47 to 77.51	2100-3315	HMT, SAF	NA	NA
24	HP	Darlaghat WLS	1962	Solan	2	02B	No		6	31.09.12 to 31.17.13	76.52.40 to 75.59.30	1075-2069	HDT	NA	NA
25	HP	Dhauladhar WLS	1994	Kangra	4	04A	Part	?	944	32.15	76.19	1600-4400	?	NA	NA
26	HP	Gamgul Siahbehi WLS	1962	Chamba	2	02A	Part		109	32.49 to 32.52	75.52 to 75.57	1800-3919	HMT, AAP	NA	NA

Sr.No.	State	Name of NP & WLS	Year of Estb.	District	Biog. Zone	Biog. Province	High Altitude Snow Leopard Area	Suggested Sl Reserve	Area (sq km.)	Location (Latitude)	Location (Longitude)	Altitudinal Range	Climate, Topography & Broad Vegetation	Status of Management Plan	PA Management status & Present land use
27	HP	Govind Sagar WLS	1962	Bilaspur	4	04A	No	?	100	31.14.03 to 31.26.30	76.26.06 to 76.51.55	350-500	SMV	NA	NA
28	HP	Great Himalayan NP	1984	Kullu	2	02A	Part	Yes	755	31.38	77.38	1500-5805	HMT, SAF, SPF	NA	NA
29	HP	Kalatop-Khajjiar WLS	1958	Chamba	2	02A	Part	?	69	32.02 to 32.04	76.01 to 76.06	1185-2768	SAF	NA	NA
30	HP	Kanawar WLS	1954	Kullu	2	02A	Part		61	31.55.10 to 32.01.13	77.17.00 to 77.23.50	1800-4833	HMT, AMS	NA	NA
31	HP	Khokhan WLS	1954	Kullu	2	02A	?		14	31.50.10 to 31.53.24	77.03.21 to 77.06.55	1500-2787	HMT, HDT, SAF, AAP	NA	NA
32	HP	Kias WLS	1954	Kullu	2	02A	?		14	31.59.31 to 32.03.19	77.09.17 to 77.12.44	2800-3680	HMT	NA	NA
33	HP	Kibber WLS	1992	Lahul & Spiti	1	01B	Entire	Yes	1400	32.32.42	77.36.17	4000-5600	?	NA	NA
34	HP	Kugti WLS	1962	Chamba	2	02A	Part	Yes	379	32.25 to 32.35	76.44 to 76.53	2250-6044	HMT	NA	NA
35	HP	Lippa Asrang WLS	1962	Kinnaur	2	02A	entire	Yes	349	31.44.15 to 31.44.18	78.08 to 78.17.38	4000-5022	HDT, ADS, AAP	NA	NA
36	HP	Majathal WLS	1954	Solan	2	02B	No		57.55	31.15.03 to 31.18.43	76.56.20 to 77.02.24	900-1966	HDT	NA	NA
37	HP	Manali WLS	1954	Kullu	2	02A	Part	Yes	32	32.13 to 32.15	77.05 to 77.10	2273-5300	HMT, AMS	NA	NA
38	HP	Naina Devi WLS	1962	Bilaspur	4	04A	No		123	31.16.40 to 31.24.36	76.25.54 to 76.35.38	500-1019	TSE	NA	NA
39	HP	Nargu WLS	1962	Mandi	2	02A	No		278	31.46.36 to 32.05.00	76.50.00 to 77.04.38	970-4034	HMT, SAF	NA	NA
40	HP	Pin Valley NP	1987	Lahul & Spiti	1	01A	Yes	Yes	675	31.44.55 to 32.11.00	77.45.00 to 78.06.09	3300-6632	AAP, ADS, AMS	NA	NA
41	HP	Pong Dam Lake WLS	1982	Kangra	4	04A	No		307	31.80 to 32.07.26	75.58 to 76.25	335-436	SPF, SMV	NA	NA
42	HP	Renuka WLS	1964	Sirmaur	4	04A	No		4	30.35.58 to 30.37.08	77.26.34 to 77.28.21	200-887	HMT, FSV	NA	NA
43	HP	Rupi Bhaba WLS	1982	Kinnaur	2	02A	Part	Yes	738	31.30.00 to 31.47.06	77.45.06 to 78.09.00	909-5650	HMT, SAF	NA	NA
44	HP	Sainj WLS	1994	Kullu	2	02A	Part		90	NA	NA	NA	HMT	NA	NA
45	HP	Sangla (Raksham Chitkul) WLS	1989	Kinnaur	2	02B	Part	?	304	31.30	78.23	3200-5486	HDT, ADS, AAP	NA	NA
46	HP	Sechu Tuan Nala WLS	1962	Chamba	2	02A	Part	Yes	103	30.15 to 32	76.20 to 77	NA	HMT	NA	NA
47	HP	Shikari Devi WLS	1962	Mandi	2	02A	No		72	31.27.03 to 31.32.16	77.05.36 to 77.13.41	1800-3395	HMT, SAF	NA	NA
48	HP	Shilli WLS	1963	Solan	2	02B	No		2	30.54.15 to 30.54.41	77.07.45 to 77.09.13	1230-1845	HMT	NA	NA
49	HP	Shimla Water Catchment WLS	1958	Shimla	2	02B	No		10	31.05.12 to 31.07.11	77.12.54 to 77.16.04	1900-2620	HMT, DHT	NA	NA
50	HP	Simbalbara WLS	1958	Sirmaur	4	04A	No		19	30.24.21 to 30.28.13	77.27.18 to 77.31.26	400-660	HMT	NA	NA
51	HP	Talra WLS	1962	Shimla	2	02B	No		40	30.57.46 to 31.03.19	77.43.30 to 77.48.21	1500-3324	HDT	NA	NA
52	HP	Tirthan WLS	1992	Kullu	2	02A	Part	Yes	61	31.34.13 to 31.39.45	77.27.30 to 77.37.23	NA	HMT	NA	NA

Sr.No.	State	Name of NP & WLS	Year of Estb.	District	Biog. Zone	Biog. Province	High Altitude Snow Leopard Area	Suggested Sl Reserve	Area (sq km.)	Location (Latitude)	Location (Longitude)	Altitudinal Range	Climate, Topography & Broad Vegetation	Status of Management Plan	PA Management status & Present land use
53	HP	Tundah WLS	1962	Chamba	2	02A	Part		64	32.27 to 32.40	76.27 to 76.37	2074-5532	HMT	NA	NA
54	Uttarakhand	Asan Barrage CR	2005	Dehradun	2	02B	No		4.444	30.25.60	77.42.00	400	?	NA	NA
55	Uttarakhand	Askot Musk Deer WLS	1986	Pithoragarh	2	02B	Part	Yes	599.93	29.30 to 29.45	80.20 to 80.25	2400-5000	SAF, HMT, AMP	NA	NA
56	Uttarakhand	Binsar WLS	1988	Almora	2	02B	No		45.59	29.4	79.45	2000-3000	HMT, SPF	NA	NA
57	Uttarakhand	Corbett NP	1936	Nainital, Pauri Garhwal	7	07A	No		520.8	29.30 to 29.39	78.93 to 79.09	400-1210	SPF, TDD, TMD	NA	NA
58	Uttarakhand	Gangotri NP	1989	Uttarkashi	2	02B	Entire	Yes	2200	30.50 to 31.12	78.45 to 79.02	NA	HMT, SAF	NA	NA
59	Uttarakhand	Govind NP	1990	Uttarkashi	2	02B	Part	Yes	472.08	31.01 to 31.17	78.00 to 78.38	1290 to 6387	HMT, SPF, SAF	NA	NA
60	Uttarakhand	Govind Pashu Vihar WLS	1955	Uttarkashi	2	02B	Part	Yes	481	31.02 to 31.20	77.55 to 78.40	1290 to 6387	HMT, SPF, SAF	NA	NA
61	Uttarakhand	Jhilmi Jheel CR	2005	Haridwar	2	02B	No		37.835	NA	NA	NA	?	NA	NA
62	Uttarakhand	Kedarnath WLS	1972	Chamoli,Rudraprayag	2	02B	Part	Yes	975.24	30.50 to 30.55	78.55 to 79.40	1160-7068	HMT, SAF	NA	NA
63	Uttarakhand	Mussoorie WLS	1993	Dehradun	2	02B	No		10.82	30.3	78.05	2005.5	SPF	NA	NA
64	Uttarakhand	Nanda Devi NP	1982	Chamoli	2	02B	Yes	Yes	624.62	31.16.40 to 31.35.38	76.25.54 to 76.35.38	3500 to 7816	HMT, SAF	NA	NA
65	Uttarakhand	Nanda Devi Biosphere Reserve	1988	Chamoli, Bageshwar, Pithoragarh	2	02B	Part	Yes	5148.00	30.01 to 31.03	79.17 to 80.20	2200 to 7700	HMT, SAF, ADS, AAP	NA	NA
66	Uttarakhand	Rajaji NP	1983	Dehradun, Pauri, Haridwar	7	07A	No		820	29.52 to 30.31	77.52 to 78.22	302-1000	TDD, TMD	NA	NA
67	Uttarakhand	Sonanadi WLS	1987	Pauri Garhwal	7	07A	No		301.18	29.40	78.45	385-1100	TMD, TDD	NA	NA
68	Uttarakhand	Valley of Flowers NP	1982	Chamoli	2	02B	Part	Yes	87.5	30.35 to 30.45	79.30 to 79.45	3350 to 6719	SAF, AMS	NA	NA
69	Sikkim	Khangchendzonga NP	1977	North Sikkim	1	01B	Part	Yes	1784	27.25.39 to 27.55.12	88.07.20 to 88.40.22	1829-8585	Sub-tropical to alpine	under preparation	PA boundary under rationalization; Forest land
70	Sikkim	Barsey Rhododendron WLS	1998	West Sikkim	2	02C	Small Part of Singalila Range		104	27.10 to 27.13	88.02 to 88.11	1600-3600	Temperate-alpine	under preparation	PA boundary under rationalization; Forest land
71	Sikkim	Fambong Lho WLS	1984	East Sikkim	2	02C	No		51.760	27.05 to 28.10	88.04 to 88.58	1375-2650	sub-tropical	under preparation	PA boundary under rationalization; Forest land
72	Sikkim	Kyongnosla Alpine WLS	1977	East Sikkim	2	02C	Small Part (adjoining W flank of Chumbi)	Yes	31	27.22. to 27.24	88.44 to 88.45	3292-4116	temperate-alpine	under preparation	PA boundary under rationalization; Forest land
73	Sikkim	Kitam WLS	2005	South Sikkim	2	02C	No		6	27.06 to 27.07	88.20 to 88.22		sub-tropical	under preparation	Forest land
74	Sikkim	Maenam WLS	1987	South Sikkim	2	02C	Small Part (adj KNP)	Yes	35.34	27.21 to 27.35	88.21 to 88.25	1600-3250	sub-tropical-temperate	Available	PA boundary under rationalization; Forest land
75	Sikkim	Pangolakha WLS	2002		2	02C	Small Part (of Chola Range)	Yes	128	27.09 to 27.22	88.35 to 88.55	NA	Sub-tropical to alpine	under preparation	Regularization of land under FCA under process; Forest land
76	Sikkim	Shingba (Rhododendron) WLS	1984	North Sikkim	1	01B	Part (of Lava Range)	Yes	43	27.43 to 27.48	88.43 to 88.46	3048-4575	temperate-alpine	under preparation	PA boundary under rationalization; Forest land
77	Arunachal	D'Ering Memorial (Lali) WLS	1978	Upper Siang	2	02D	No		190	27.53 to 28.10	95.23 to 95.30	100-250	TSE	NA	NA
78	Arunachal	Dibang WLS	1991	Dibang Valley	2	02D	Small Part		4149	28.27.08 to 29.31.31	94.29.34 to 95.49.55	1500-5000	HMT, SPF	NA	NA
79	Arunachal	Eaglenest WLS	1989	West Kameng	2	02D	No		217	27.09	92.21	1100-2900	TSE, SPF	NA	NA

Sr.No.	State	Name of NP & WLS	Year of Estb.	District	Biog. Zone	Biog. Province	High Altitude Snow Leopard Area	Suggested Sl Reserve	Area (sq km.)	Location (Latitude)	Location (Longitude)	Altitudinal Range	Climate, Topography & Broad Vegetation	Status of Management Plan	PA Management status & Present land use
80	Arunachal	Itanagar WLS	1978	Papum Pare	2	02D	No		140.300	27.06	93.29	210-1164	MWT, TSE	NA	NA
81	Arunachal	Kamlang WLS	1989	Lohit	2	02D	Small Part		783	27.44	96.39	200-4578	TWE, SPF	NA	NA
82	Arunachal	Kane WLS	1991	West Siang	2	02D	No		55	27.4	94039	120-1500	TSE, SAF	NA	NA
83	Arunachal	Mehao WLS	1980	Dibang Valley	2	02D	No		281.5	28.05 to 29.15	95.40 to 96.03	330-3560	MWT, TSE	NA	NA
84	Arunachal	Mouling NP	1986	Upper Siang	2	02D	Small Part		483	28.33	94.46	700-3064	HMT	NA	NA
85	Arunachal	Namdapha NP	1983	Changlang	2	02D	Small Part		1807.82	27.23 to 27.39	96.15 to 96.58	200-4578	MWT, SAF	NA	NA
86	Arunachal	Pakke WLS	1977	East Kameng	2	02D	No		861.95	26.5	92.5	150-1900	TWE	NA	NA
87	Arunachal	Sessa Orchid WLS	1989	West Kameng	2	02D	No		100	27.11	92.32	800-3100	SBH	NA	NA
88	Arunachal	Tale Valley WLS	1995	Lower Subansiri	2	02D	No		337	27.35 to 27.40	94.15 to 94.20	1500-2700	HMT, SAF	NA	NA
89	Arunachal	Yordi-Rabe Supse WLS	1996	West Siang	2	02D	Small Part		491.62	29.00.59	95.12.31	1500-2500		NA	NA

Other Important Landscapes where conservation areas need to be identified:

J&K	Zanskar
HP	Lahul
UA	Upper Kumaon
	Areas north of Nanda Devi
Sikkim	The Tibetan Plateau areas on N & W of state
Arunachal	Tawang
	Entire strip above 4,000m

* High altitude (snow leopard areas)

Entire	Almost entire area is high altitude (&SL range)
Part	Has some high altitudes, and some below treeline or < c.3,000m
Small Part	Very small portions in high altitude areas
No	No areas in high altitudes
?	Not clear

Veg. Types	
AAP	Alpine Arid Pasture;
ADP	Alpine Dry Pasture;
ADS	Alpine Dry Scrub;
AMP	Alpine Moist Pasture;
AMS	Alpine Moist Scrub;
FVG	Flooded Valley Grassland;
HDS	Himalayan Dry Scrub;
HDT	Himalayan Dry Temperate;
HMT	Himalayan Moist Temperate;
HSS	Himalayan Secondary Scrub;
HWT	Himalayan Wet Temperate;
MFV	Freshwater Swamp;
MNF	Littoral Forest;
MSM	Seasonal Marsh;
RIV	Riverine Vegetation;
SAF	Sub-Alpine Forest;
SBH	Sub-Tropical Broad Leaved Hill;
SDE	Sub-Tropical Dry Evergreen;

Veg. Types	
SDS	Sub-Alpine Dry Scrub;
SMH	Montane Wet Temperate Forest;
SPF	Sub-Tropical Pine Forest;
SSS	Sub-Tropical Secondary Scrub;
TAZ	Tropical Arid Zone;
TDD	Tropical Dry Deciduous;
TDE	Tropical Dry Evergreen;
TGL	Tropical Grasslands;
TMD	Tropical Moist Deciduous;
TMS	Tropical Moist Scrub;
TSE	Tropical Semi-Evergreen;
TSS	Tropical Secondary Scrub;
TTF	Tropical Thorn Forest;
TWE	Tropical Wet Evergreen.

12 ACTIVITY FLOW CHART

PROJECT SNOW LEOPARD