

Management Plan for Pin Valley National Park, Lahaul & Spiti, Himachal Pradesh
2018 –2028



Himachal Pradesh
Forest Department

Himachal Pradesh Forest Department (Wildlife Wing)





Foreword

Mountains are undoubtedly one of the most vulnerable ecosystems on the earth. Though they harbor a spectacular diversity of wild flora and fauna, often unique to the mountain habitats, they are under severe pressure from local communities who are dependent on the ecosystem goods and services provided by the mountains for their livelihood and sustenance. Therefore, management of protected areas in high mountains has always been riddled with the challenges and dilemmas.

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 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.

In this context, developing a management plan for Pin Valley National Park had to be carried out in the backdrop of experience gained and knowledge generated over the years under the Project Snow Leopard in Upper Spiti Landscape and the research findings made by some hard core professionals in the area. The National Park is also a core zone of Cold Desert Biosphere Reserve and has a unique bio-diversity. Due process of inviting the comments and carrying out the consultations with the field staff of forest department was carried out and where relevant these were incorporated in the Plan. Overall, the Management Plan is refreshingly bold in its approach and given a short period, the technical guidance given by the experts of Nature Conservation Foundation (NCF), Mysuru is commendable. I also thank Chief Wildlife Warden Dr. R.C.Kang for providing valuable suggestions in finalizing this management plan.

I do hope that the concerned field staff of PA and managers would find it a useful document and would take wildlife management efforts in Pin Valley National Park to the next level, by the time this plan is due for revision after ten years.

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Preface

The Asiatic Ibex (*Capra sibirica*) is unique to Central Asia. The Pin Valley National Park is a safe haven to about 200-250 ibex and the rare snow leopard. The Park falls near the southern boundary of the snow leopard distribution for the State of Himachal Pradesh. It also forms the south-western boundary of ibex distribution. It is known that populations at the edge of a species' range are likely to have low growth rates and be more vulnerable to extirpation, compared to populations located in the core of the species' range. Also for wide ranging species like snow leopards that range over a few hundred square kilometres, it is critically important that large landscapes be conserved.

Areas surrounding the Park are inhabited by agropastoral communities who depend entirely on the ecosystem for their livelihood. Local communities and wildlife depend pervasively on the landscape. Negative behaviour of local communities can magnify the threat to wildlife and is therefore important to work with local communities, in order to conserve these rare species. Parts around the Pin Valley National Park are also accessed by migratory herders during summer months. All these factors make the Pin Valley National Park an area in need of critical attention in terms of management.

In line with this requirement, we are happy to have developed the first management plan for the Pin Valley National Park. Through this plan we hope to work closely with local communities residing in the landscape, identify their needs and implement micro-plans aimed at fostering coexistence between these local communities and the wildlife with whom they share this landscape. The Plan also lists our critical areas of research that will be focussed on through the plan period.

The plan is for a period of 10 years (2018-2028) at a budget of Rs 789.3 lacs. We are confident that the Spiti Wildlife Division, their partners and all other Stakeholders will be able to successfully implement this plan.

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Part I
Existing situation of the protected area

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Part 1

Existing situation of the protected area

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1. Introduction to Pin Valley National Park

1.1 Location, extent & approach

The Pin Valley National Park (PVNP) is located in the Spiti sub-division of Lahaul & Spiti District in Himachal Pradesh (HP), India (Fig. 1). The park stretches between $31^{\circ} 6' 40''$ to $32^{\circ} 2' 20''$ N latitude and $77^{\circ} 4' 21''$ to $78^{\circ} 6' 19''$ E longitude.

The national park can be approached by two routes; from Shimla via Rampur and Reckong Peo (in Kinnaur District) one can reach Tabo, then across Attargu bridge enter Pin Valley. The other route is from Manali via Kunzum pass to Kaza, then across Attargu bridge access Pin Valley. On foot one can enter Pin Valley from Kinnaur across Pin-Bhaba pass from Bhaba Valley, Larsawe pass from Kiran khud and Manerang pass from Ropa. From Kullu one can enter Pin across Pin – Parvati Pass. The national park is flanked by the Bara Shigri glacier complex to the north, the Great Himalayan National Park (in Kullu District) to the west and the Rupi - Bhaba Wildlife Sanctuary (in Kinnaur district) to the south.

1.2 Zonation

The intention for establishing this national park was declared in 1987. The intended area of the national park is 1825 km^2 which include a core zone of 675 km^2 and a buffer zone of 1150 km^2 (Fig. 1). Majority of the core area lies in the Parahio catchment formed by five tributaries Khamengar, Debsa, Killung, Kocho and Kidul Chu or Minsar nala. The buffer zone includes the entire Pin watershed (including Parahio and Ensa) and upper part of Ratang nala and extends east of the core area till the confluence of Pin and Spiti rivers.

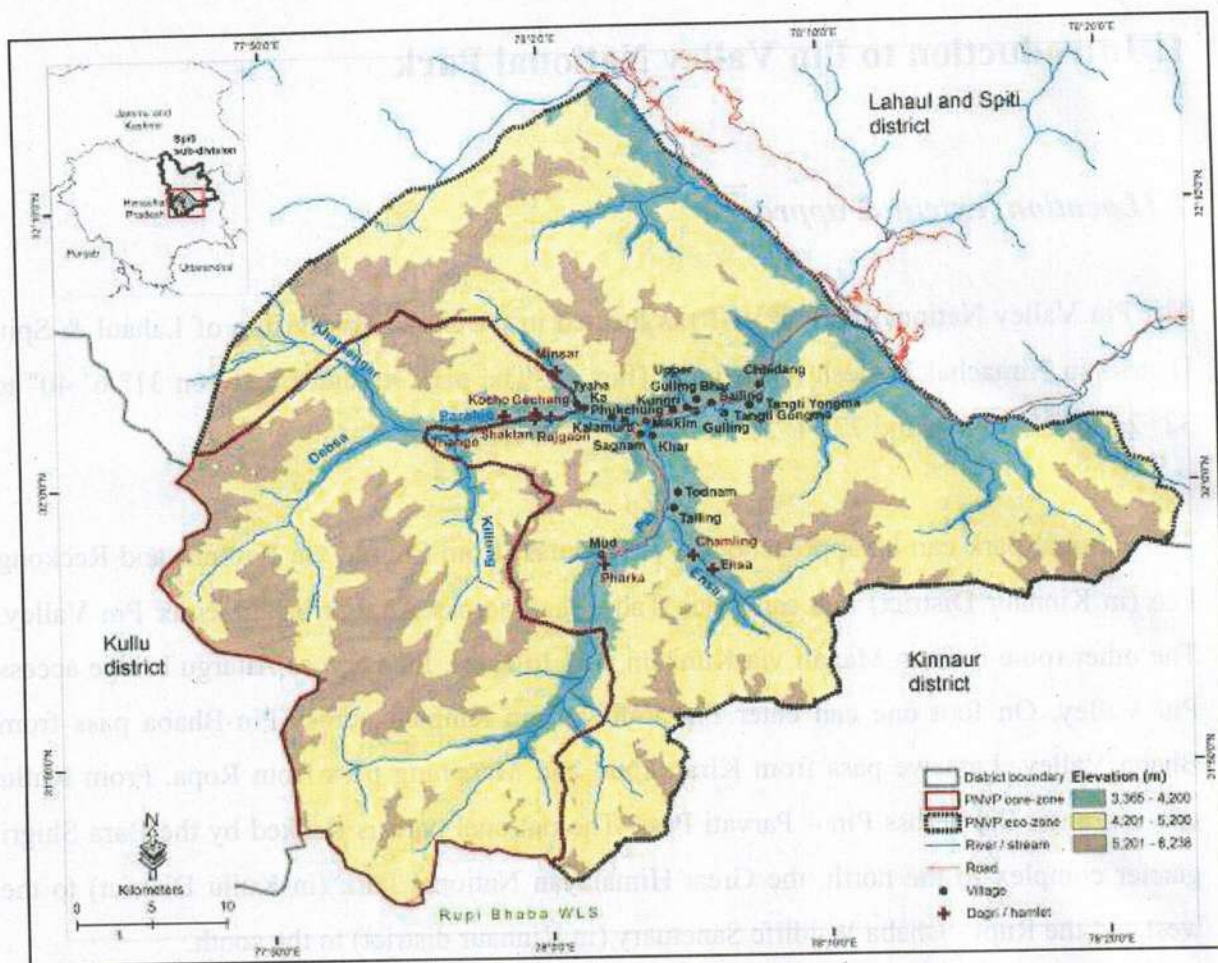


Figure 1: An outline of the Pin Valley National Park in Spiti sub-division, Lahaul & Spiti District, Himachal Pradesh, India, with villages, hamlets (dogri), roads and streams, boundaries of core and buffer areas.

1.3 Statement of significance

The PVNP is a stronghold of a breeding population of 200-250 Asiatic ibex *Capra sibirica* individuals (density of 0.45 individual per sq.km in 2016). Ibex receives highest legal protection in India as a Schedule I species. Ibex serve as the primary prey of the endangered snow leopard *Panthera uncia*, the top-predator of the PVNP and 'flagship' species for conservation of Indian Himalaya. Snow leopard density has been estimated to be 0.53 individuals per 100 sq.km (95% Confidence Interval 0.21 - 1.36 individuals per 100 sq.km).

PVNP is contiguous with the Great Himalayan National Park (UNESCO World Heritage Site) and Rupin-Bhaba Wildlife Sanctuary. The three protected areas together support an aesthetically important and biologically rich and diverse patch of Himalayan and Trans-Himalayan ecosystem across an area of *ca.* 3,500 sq.km. This area supports, in addition to a unique assemblage of mountain flora and fauna, livelihood of primarily agro-pastoralist people dwelling the mountainous ecosystem, serving them with water, pastures for livestock grazing, fuel-wood, fodder and medicinal plants. There is widespread use of natural resources by local and migratory communities within the protected areas. Given low-productivity and low availability of natural resources in Trans-Himalayan rangelands, science-based conservation management of PVNP is a necessity for long-term social and ecological security of the people and wildlife inhabiting the protected area.

2. Eco Sensitive Zone Notification

The National Wildlife Action Plan (NWAP) 2002-2016 indicates that areas outside the protected area network are often vital ecological corridor links and must be protected to prevent isolation of fragments of biodiversity which will not survive in the long run. Land and water use policies will need to accept the imperative to strictly protecting ecologically fragile habitats and regulating use elsewhere. It was further recommended that lands falling within 10 km of the boundaries of national parks and sanctuaries be notified as eco-fragile zones under section 3 (v) of the Environment (Protection) Act and Rule 5 Sub rule (viii) & (x) of the Environment (Protection) Rules.

Following this guidance a proposal to set up an eco-sensitive zone (ESZ) around the Chandratat Wildlife Sanctuary was tabled before the 19th Expert Committee for Declaration of Eco-Sensitive Zone around Wildlife Sanctuaries/National Parks held on 4 July 2016 in New Delhi.

The salient features of proposal tabled for the declaration of ESZ were:

- Area of Protected Area: 675 sq.km
- Proposed area of the ESZ: 1150 sq. km
- Proposed extent of ESZ: 45.83 km

After detailed deliberation, the Committee recommended for finalization of the draft notification after incorporating details of the flora and fauna found in National Park area.

3. Physical characteristics

3.1 *Topography & soil*

Pin Valley is formed by the Pir Panjal Range, an offshoot south of the main Himalayan axis. The area represents a cold-desert (biogeographic zone 1: 'Trans-Himalayan Cold Desert'), characterized by rugged cliff-dominated terrain (Fig. 2). Altitude varies from about 3,450m (near confluence of Pin and Spiti rivers) to more than 6,000m in the Bara Shigri glacier area.

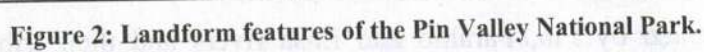
Soil in Pin Valley is mostly silty - loam to silty - clay loam in texture with a slightly alkaline pH, poor organic matter and water holding capacity. The soil is low in available nitrogen, phosphorous, potassium and carbon, with relatively high calcium content.

3.2 *Hydrology*

Pin Valley is drained by Pin, Parahio and Ensa rivers and their tributaries (Fig. 1). Pin originates near Pin-Parvati Pass on the Spiti-Kullu divide. Parahio is formed by two tributaries named Debsa and Khamengar, while another important tributary is Killung. The Spiti-Kullu divide to the west and Pin-Bhaba divide to the south of the Pin catchment has numerous glaciers. The Shigri glacier complex is to the north of Pin catchment.

3.3 *Climate*

Pin Valley has sub-arctic and alpine climatic conditions. Summer season is short (July-August), characterised by mild temperatures (maximum temperatures around 30 degree Celsius) and low rainfall. Winter (November-March) is long with minimum temperature up to minus 40 degree Celsius and heavy snowfall (ca. 300 cm). Occasional rainfall occurs during summer season.



4. History of management and existing practices

The overarching forestry related policies of the Himachal Pradesh Forest Department (<http://www.hpforest.nic.in/>) guiding management practices in protected areas are the Himachal Pradesh Forest Sector Policy (2005), policy on development of Eco-Tourism in Himachal Pradesh (2005), Himachal Pradesh Forestry Medicinal Plants policy (2006) and Policy on Payment for Ecosystem Services (PES) in Himachal Pradesh (2013). Working plans are developed under these forest management policies and laws.

The current management plan is the first for the Pin Valley National Park.

5. Existing research and conservation activities

4.1 Existing research

Ibex ranging behaviour in relation to habitat characteristics and livestock

A study to understand ranging behaviour of Asiatic ibex was conducted in Pin Valley by collaring ibex individuals (Bhatnagar, 1997). Fifteen individuals of ibex were captured near Gechang during May-June, 1994 (Bhatnagar, 1997). These individuals were radio-tracked for one year from spring 1994 (June) to spring 1995 (May). Home-range size of ibex in relation to habitat structure and vegetation characteristics was described. Ibex had a mean home range size of $30.33 \pm 4.5 \text{ km}^2$. Males had larger annual home ranges ($43.8 \pm 3.4 \text{ km}^2$) compared to females ($20 \pm 0.7 \text{ km}^2$).

Home range size of ibex females was positively correlated with forage availability. Home range sizes of females was largest during summer, followed by autumn, winter and spring. Home range size of males had no clear relationship with forage availability. However, on excluding winter range sizes of males, a positive correlation between home range size and forage availability was observed. A weak negative correlation between range sizes and forage quality was observed for both sexes. Ibex had smaller home ranges during winter and spring, presumably owing to lower forage availability and poor mobility through snow.

This work noted high spatial overlap between ibex and resident livestock in spring season. During summer, however, ibex moved to higher elevations, while most livestock remained along the valley bottom, thus, resulting in spatial separation. While ibex preferred slopes between 31° and 60° , livestock consistently preferred slopes $\leq 30^\circ$. Livestock preferred areas $>100\text{m}$ from escape terrain (cliffs) during summer and autumn, while ibex preferred areas between $1\text{m} - 50\text{m}$ from escape terrain. Again, ibex preferred areas with escape terrain in 3 or 4 directions, while livestock preferred areas with escape terrain not within 100m in any direction.

Interference competition between migratory livestock and Asiatic ibex

Interference competition between migratory livestock and Asiatic ibex was documented by Bagchi *et al.* (2004). Interference competition manifested through overlap of diet between ibex and livestock and habitat partitioning. Ibex populations segregated from migratory livestock grazed areas to be restricted to cliff-dominated areas. The results for this study suggested goats and sheep of migratory herders forced resource limitations on ibex and excluded them from pastures. In the remaining suitable habitat, ibex shared forage with horses. Ibex remained relatively unaffected by other large-bodied livestock, such as yak, donkey, cattle and yak-cattle hybrids. Livestock removed large amounts of forage from the pastures (nearly 250 kg of dry matter/day by certain species), thereby reducing forage availability for ibex.

Vegetation

Plant taxonomists have documented plants in general and also medicinal plants in PVNP. Aswal & Mehrotra (1994). Polunin and Stainton (1984) reported numerous plant species from PVNP region. Kala (2000) documented medicinal plants. Kala (2005) reported 17 threatened medicinal plants, including endemic and critically endangered species, such as *Gentiana kurroo* and *Malaxis muscifera* from PVNP. Chandra Sekar & Srivastava (2009) provided a detailed documentation of plants of PVNP.

4.2 Ongoing research

Long-term population monitoring of Asiatic ibex

Long-term ibex population monitoring by Nature Conservation Foundation (NCF) and the Snow Leopard Trust (SLT) working together with the Himachal Pradesh Forest Department (HPFD) is on-going since 2010. This work will contribute to understand trend and demographic characteristics of ibex population in PVNP. A detailed account of ibex population trend is given in Section 6.2.3 of the management plan.

Long-term population monitoring of snow leopard

Snow leopard population density estimation was undertaken for the first time in PVNP during autumn of 2016 by NCF-SLT with support from HPFD. Preliminary results showed estimated snow leopard density to be 0.53 (95% Confidence Interval 0.21-1.36) individuals/100 km². Detail on the camera-trapping activity has been given in Section 6.2.1 of the management plan.

Long-term population monitoring of resident / local livestock

Population of resident livestock is being monitored since 2010. Detail on livestock population across fourteen villages in PVNP, along with livestock losses, have been summarized in Sections 5.1 and 5.4 of the management plan.

Impacts of migratory livestock grazing on rangeland vegetation

A study looking at ecological impacts of migratory livestock on rangeland vegetation is ongoing since 2015 (Ghoshal *et al.*, in review). Results from this work show grass and herb biomass to be significantly lowered in areas grazed by migratory livestock (Appendix 1). Mean biomass of palatable species was 2.25 times higher in areas not grazed by migratory livestock (Appendix 1).

Impacts of migratory livestock grazing on Asiatic ibex

Population density of Asiatic ibex was consistently lower in areas grazed by migratory livestock than ungrazed areas (Ghoshal *et al.*, in review). Impact of migratory livestock grazing on young: adult female ratios was unclear, however, during peak summer, yearlings of ibex were excluded from areas grazed by migratory livestock. Reduction in forage availability is reducing ibex population densities in areas grazed by migratory livestock.

Changes in practices of migratory livestock grazing

Changes in migratory livestock grazing practice over the past decade were documented by Ghoshal *et al.* (in review). Herd sizes of migratory livestock grazing pastures in Pin Valley

nearly doubled between 2005 and 2015. Livestock composition of herds changed over the past decade, with 139% increase in goat and 42.60% increase in sheep (Appendix 1). Mean number of goat in a herd was 255.40 (SE $\pm$ 28.96) in 2005 and 610.77 (SE $\pm$ 71.46) in 2015. Mean number of sheep in a herd was 313.84 (SE $\pm$ 24.85) in 2005 and 447.50 (SE $\pm$ 35.53) in 2015.

Perception of migratory herder and local communities on changes in pasture quality

Pasture quality was reported to be changing over the past decade by 96% migratory herders (sample size 25; constitutes more than half of total number of herders coming into Pin Valley for livestock grazing) (Ghoshal et al., in review). All of these herders reported degradation of pasture quality.

The migratory herders reported three changes in vegetation attributes of pastures, namely, 'decreasing pasture area' – the extent of pastures are declining, 'palatable forage decreasing' – availability of palatable plant species are declining and 'unpalatable forage increasing' – availability of unpalatable plant species are increasing. Decline in availability of palatable species was reported by 76% herders. About one-third (28%) of herders reported decreasing pasture area and increase in availability of unpalatable species, respectively.

Majority of respondents (60%) reported irregular rain and snow as the reason for changes in pasture quality, 52% reported intense grazing, while 36% reported pollution. As a result of perceived pasture degradation, occurrence of frequent disease was reported as an implication by 44% migratory herders, 32% reported decreasing body-size of livestock and reduced milk production by livestock, respectively, 20% reported they had to find new pastures every three to five years, 8% reported chronic weakness in livestock and low regeneration in pastures, respectively, while one herder (4%) reported livestock dying suddenly, potentially due to consumption of unpalatable species.

The local community reported migratory livestock grazing affects pasture quality through degradation (rapid degradation was suggested by two villages, while one village suggested gradual degradation). Degradation of pasture quality was suggested to be manifesting through five ways: lowered seed dispersal – continuous foraging on plants by migratory livestock since late - spring through summer (the main growing period) impairs flowering, seed

formation, seed development and dispersal; reduced plant growth – repeated foraging on same tracts of a pasture hinder growth of plants; increase in unpalatable species – owing to high intensity of grazing palatable species are overcome by unpalatable species; decline in medicinal plant availability – areas grazed by migratory livestock show low availability of medicinal plants; and landslide / denudation – trampling by livestock loosens top-soil making pastures grazed by migratory livestock prone to landslide and subsequent denudation.

4.3 Conservation activities

Long-term educational programme

HPFD with support from NCF-SLT has been organizing nature education camps near Kibber Village for about a decade. Schools in Pin Valley have been participating in this program. Students of 5th – 8th standard visit the education camps. Trained staff from NCF-SLT along with the Forest Department staff also visit schools in Pin Valley to spread awareness on nature and conservation of wildlife.

Community-based livestock insurance programme

An insurance programme has been initiated by NCF-SLT in partnership with the local people and the HPFD in Sagnam to offset losses of horse due to depredation by wild-carnivores. A detailed account of the livestock insurance programme is given in Section 5.4 of the management plan.

Image 1: Parahio catchment of Pin Valley National Park, as seen from Ka village. The Parahio catchment is formed by dry steppe vegetation with steep cliff-dominated terrain.

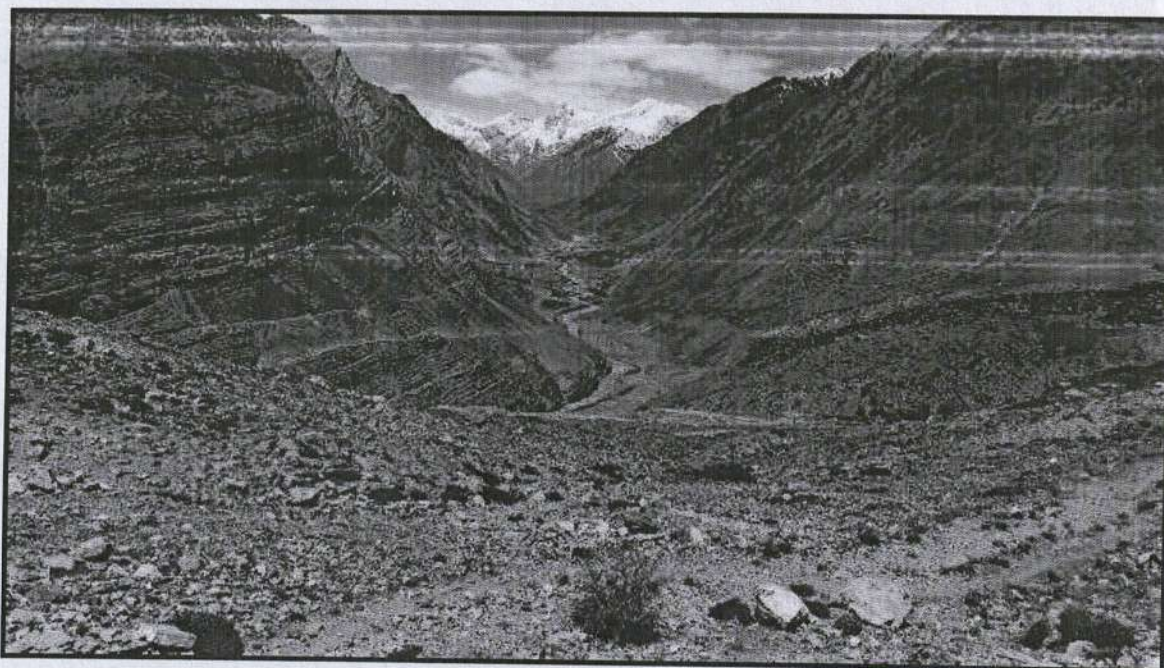
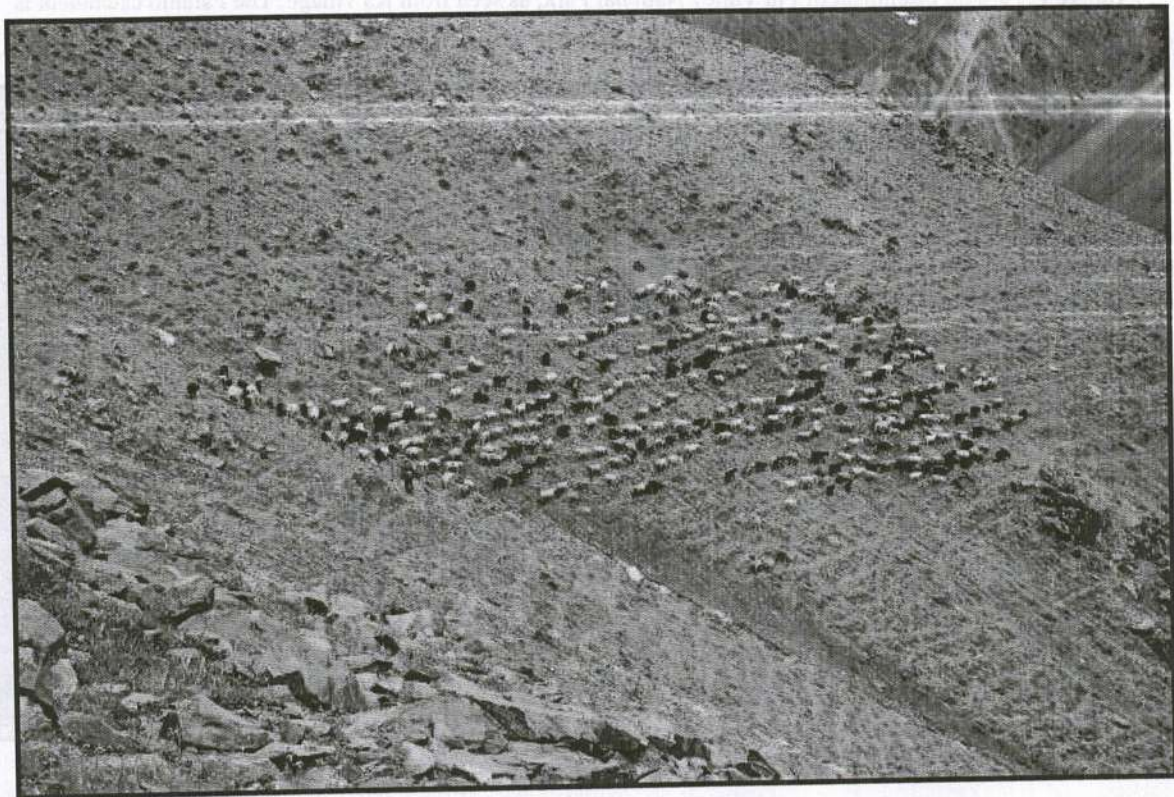


Image 2: Migratory livestock grazing in Pin Valley National Park has been a long-standing practice. Grazed areas experience lowered forage availability and poor densities of Asiatic ibex.



6. Status of land-use in Pin Valley National Park

6.1 Distribution of villages

Villages in Pin Valley are located mainly along the Pin River (Fig. 1). Sagnam, with 72 houses, is the largest village, followed by Kungri with 37 houses and Tailing with 35 houses (Table 1a). Mud is at the road-head along Pin River, while Ka-Tyaha is at the road-head along Parahio catchment. Some of the major villages are Sagnam, Mud, Tailing, Kungri and Gulling. All the villages are outside the designated core area of the national park. The villages nearest to the core area of the national park are Mud and Ka.

Table 1: Number of houses and species-wise livestock population for villages in Pin Valley National Park in 2016

Village	No. of houses	Yak	Dzo/dzomo	Cow	Horse	Donkey	Sheep	Goat	Total livestock
Sagnam	72	109	98	104	80	139	90	7	627
Kungri	37	22	54	16	45	59	0	0	196
Tailing	35	42	67	79	71	68	6	8	341
Mud	34	49	40	30	30	68	34	18	269
Bhar	28	31	101	58	63	69	68	50	440
Gulling	22	26	20	11	19	10	18	10	114
Tangti	20	17	10	11	18	36	28	26	146
Gongma									
Tangti	19	21	3	28	17	33	61		163
Yongma									
Khar	18	18	9	25	29	27	2	4	114
Sailing	11	8	9	11	6	8	31	7	80
Todnum	11	15	12	27	27	19	0	0	100
Upper Gulling	10	11	14	18	12	10	0	0	65
Mikkim	7	6	7	3	4	5	0	0	25
Chidang	4	1	3	4	0	2	0	0	10

Summer agricultural settlements (dogri) are numerous in the valley, located usually within ten kilometres from a village (Fig. 1). Some of the large dogris of Sagnam village are

Rajgaon, Gechang and Thango in Parahio catchment. Minsar dogri in Kidul Chu is used by people from Gulling. Ensa dogri inside Ensa nala is used by people from Tailing and Todnum villages. Farka is a major dogri for people of Mud village. Many of these dogris, e.g. Rajgaon, Shaktan, Gechang and Thango are inside the core area of the national park.

6.2 Local community

Pin Valley is inhabited by agro-pastoralist people. Owing to scarcity of arable land and limited natural resources human population density is low at 2 persons per square kilometre. Local people are followers of Buddhism. Kungri monastery is the main religious centre in the valley.

Local people have been traditionally involved in barter-trade with people from neighbouring Kinnaur (especially people from Rupi-Bhaba area). Over the past three decades local economy has shifted to a more market-oriented cash-based system owing to cash-crop (green pea) production in the villages of the valley.

Some locals are involved in trade with Ladakh (via Parang *la*) and Tibet (via Shipki *la*). A major trade commodity is *chhumurti* horses reared by local people of Pin Valley. Anecdotal information suggest Pin Valley served as a transit of illegal-trade of musk of musk-deer, gall bladder, coat and nail of black and brown bear between Kinnaur and Tibet.

6.3 Agriculture

Cultivation is restricted to arable areas near villages owing to limited availability of arable land, limited primarily by availability of irrigation water and deep soil areas. Barley (*Hordeum vulgare*), green and black pea (*Pisum sativum*) and potato (*Solanum tuberosum*) constitute the major crops. Green pea has gained importance as a cash crop over the last three decades. Some households, depending on availability of man-power, have access to additional agricultural areas in dogri, located away from villages, where they tend cattle, collect fodder and fuel and cultivate crops between April and October.

6.4 Local livestock grazing

Livestock grazing is one of the primary livelihoods of local people. People own yak, cow, yak-cow hybrid [locally called *dzo* (male), *dzomo* (female)], horse, donkey, sheep and goat. Sheep-goat is grazed communally in pastures near to villages through summer. Usually there are two-three pastures to graze sheep-goat of one village. Grazing is rotated from one pasture to another through summer months. Larger bodied livestock like donkey, yak and yak-cow hybrids are allowed to graze freely in pastures farther and higher from villages through summer. Every now and then a representative team from a village would assess the conditions of the animals and report back to village any loss or death of animals. Cows are guided to pastures near villages by respective owners and brought back to village during dusk. Horses are grazed communally in pastures specifically designated as horse-grazing grounds. All livestock is stall-fed in villages during winter.

Small and large livestock numbers remained largely stable in PVNP during 2010-2015. Small livestock (sheep-goat) population drastically declined, while that of large livestock increased from 2015 to 2016. The total number of small livestock in PVNP was 468 in 2016, while 1,127 in 2015. The number of large livestock was 2026 in 2016, while 1,839 in 2015. Change in local livestock population in PVNP since 2010 is given in Table 1b.

Table 1b: Livestock population in Pin Valley National Park between 2010 and 2016

Year	2010	2011	2012	2013	2014	2015	2016
Sheep	100	100	100	100	100	100	100
Goat	100	100	100	100	100	100	100
Yak	100	100	100	100	100	100	100
Donkey	100	100	100	100	100	100	100
Horse	100	100	100	100	100	100	100
Cow	100	100	100	100	100	100	100
Small livestock	468	468	468	468	468	468	468
Large livestock	1839	1839	1839	1839	1839	1839	2026
Total	2307	2307	2307	2307	2307	2307	2494

Table 2: Overall livestock population of Pin Valley National Park between 2010 and 2016. Sheep and goat are considered as small livestock

Year	Yak	Yak-cow hybrid	Cow	Horse	Donkey	Sheep	Goat	Total	Total small livestock	Total large livestock
2010	276	324	204	421	474	280	354	2333	634	1699
2011	296	299	297	438	444	599	715	3088	1314	1774
2012	244	362	282	433	518	575	513	2927	1088	1839
2013	346	449	225	400	452	708	458	3038	1166	1872
2014	299	441	287	398	448	807	576	3256	1383	1873
2015	286	346	303	424	480	697	430	2966	1127	1839
2016	354	393	409	376	494	338	130	2494	468	2026

Depredation on livestock by snow leopard is prevalent in PVNP (Table 2). Since 2010, the number of livestock killed by snow leopard has been fluctuating, with 77 livestock heads being killed in 2016. Livestock depredation by wolf has been reported only seen 2013, with 24 heads of livestock being killed by wolf in 2016. Free-ranging dogs also kill livestock and the numbers of livestock killed by dogs have been fluctuating since 2010, with 69 livestock being killed in 2016.

The numbers of livestock mortality due to disease have been fluctuating since 2010, with 9 livestock deaths from disease in 2016. (Table 2)

Table 3: Livestock losses in Pin Valley National Park between 2010 and 2016

	2010	2011	2012	2013	2014	2015	2016
Depredation							
Snow leopard	53	119	64	65	32	66	77
Wolf	0	0	0	4	0	20	24
Dog	0	24	88	42	51	45	69
Depredation sub-total	53	143	152	111	83	131	170
Other livestock loss							
Disease	7	9	17	6	34	17	9
Missing	0	0	5	14	5	9	23
Unknown	0	0	0	22	0	0	0
Other loss sub-total	7	9	22	42	39	26	32
Total livestock loss	60	152	174	153	122	157	202

A community-run livestock insurance program has been initiated in Sagnam since 2013 to offset losses of horses due to snow leopard depredation (Table 3). The cost of participation in the programme is subsidised through a contribution from an external agency. At the end of a year, the number of cases is evaluated by a committee appointed within the participants and claims are settled after confirmation that the case was genuine. Also, a carcass of an animal killed by a wild carnivore is left for the carnivore to consume--a rule within the programme. The insurance program helps improve attitude of local people towards wild-carnivores and avoid retaliatory killing of snow leopard. Chumurti horses are a rare breed that fetches a high price. Horses are reared extensively in the villages of Pin Valley and are sold at trade fairs like the Lavi fair in Rampur. Young horses are also at threat from carnivores like snow leopards and wolves, since they graze in pastures far away from villages for most of the year.

Table 4: Indicative figures of the ongoing horse insurance programme in Sagnam, Pin Valley National Park

Year	Opening Balance	Number of horses insured	Collection (Villager + NCF-HPFD)	Cases Reported	Compensation Paid	Closing Balance	No. of participant families
2013-14	0	58	83,240/-	4	17,000/-	66,000/-	32
2014-15	66,000/-	68	86,240/-	6	40,000/-	112,026/-	36
2015-16	112,026/-	66	101,560/-	9	56,000/-	157,586/-	38

6.5 Migratory livestock grazing

Migratory herders from Kinnaur and Upper Shimla District access pastures in Pin Valley for summer grazing during June-August in 40-45 groups, approximately 55,000-60,000 sheep-goat graze in Pin Valley. Majority of the herders are from Rupi-Bhaba area. The herders come into Pin Valley across the Pin-Bhaba Pass. Migratory herders use pre-designated campsites to pitch make-shifts tents. Migratory herders use pastures in Chhohem, Lal nala, Khamengar, Debsa, Noor and Killung within the core area of the national park in Parahio catchment. In Ensa valley, a group of migratory herders use pastures in Shinsa nala. In Pin catchment, migratory herders are present on hill-slope on the right bank of Pin between Tailing and Mud villages, Shian, Larang, Bara- & Chhota-Baldhar, pastures enroute Pin-Parvati (e.g. Dumundhar) and Pin-Bhaba passes (e.g. Tey Nima). The approximate area of

pasture grazed by migratory livestock within PVNP is 160 km² (Fig. 3). The approximate density of sheep-goat within these grazed pastures is 366-400 livestock per km².

Migratory herders from Kinnaur have been accessing pastures in Pin Valley for centuries. Earlier, before the advent of cash-based economy, migratory herders used to bring grains, cereals and fruits for local people of Pin Valley. In lieu of these subsistence materials, local people allowed migratory herders to access pastures not directly used by villagers. The villagers also shared barley *sattu* with herders. The villagers benefited from livestock dung as manure for agricultural land. At the end of summer, migratory herders would gift a few sheep-goat to eminent villagers. After introduction of grazing permits, till mid-1980s, only pasture right holders used to graze livestock. In current times, most original pasture right holders depend mainly on apple farming in Kinnaur. On behalf of these right holders, other herders are accessing pastures. They pay a fee to the village council to access pastures that may vary from a nominal two thousand rupees for every three years to forty five thousand rupees for one season. Migratory herders pay a nominal amount (Rs. 1,500-2,500) to village council for damage along trail in addition to pasture fee. Pasture and trail damage fees are utilised by villagers towards mainly religious activities and sometimes towards maintenance of common facilities in village such as, repairing irrigation channels and community hall.

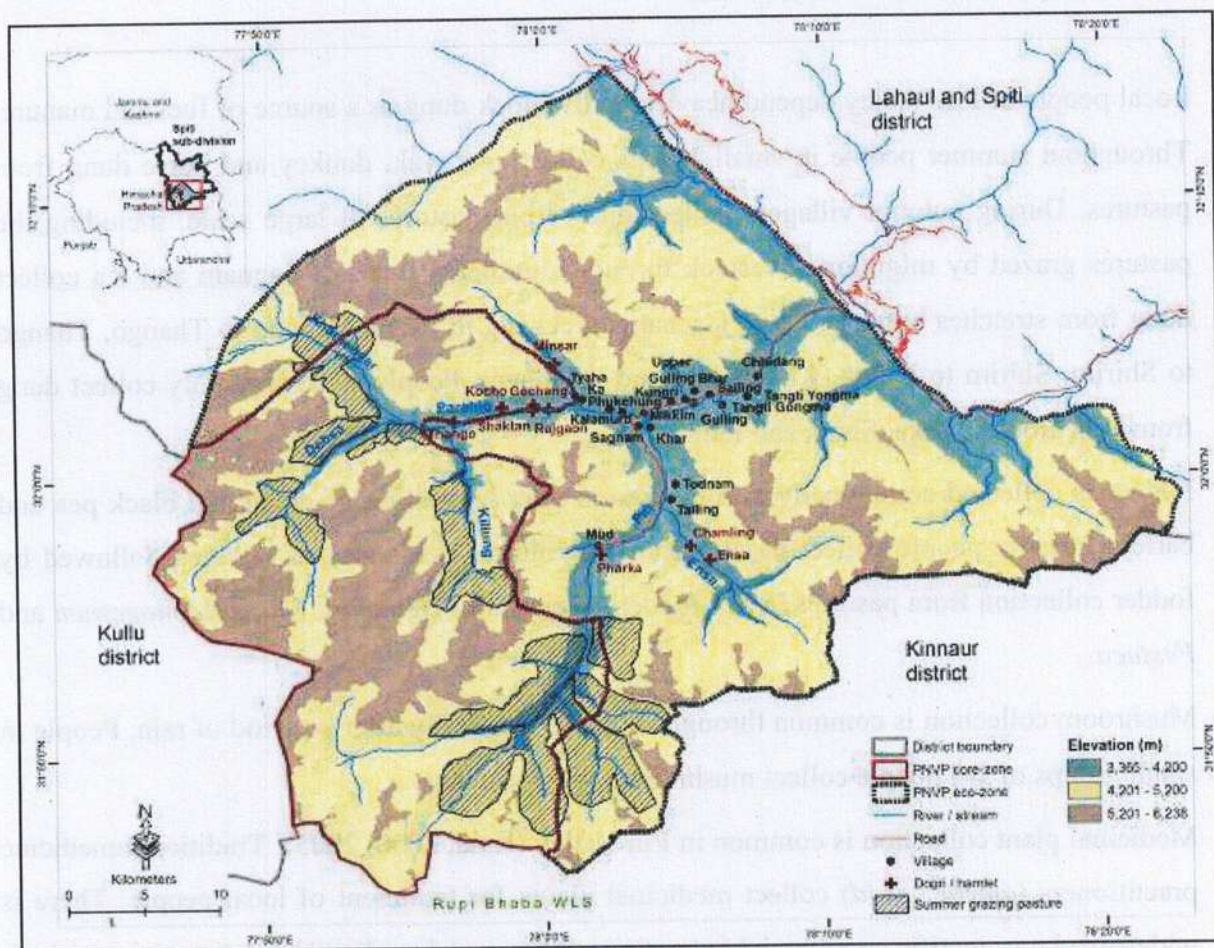


Figure 3: Areas grazed by migratory livestock in Pin Valley National Park. Nearly all the pastures grazed are within the designated core area of the national park. Migratory livestock graze for about two months during June – August in Pin Valley.

6.6 Other natural resource use

Local people of Pin Valley depend heavily on livestock dung as a source of fuel and manure. Throughout summer people in small groups collect cow, yak, donkey and horse dung from pastures. During autumn villagers collect dung from pastures at large scale, including the pastures grazed by migratory livestock through summer. People of Sagnam and Ka collect dung from stretches between Ka to Gechang, Gechang to Kocho, Kocho to Thango, Thango to Shirim, Shirim to Debsa, Khamengar and Chhohem. People of Mud mainly collect dung from area around Farka, Shian and Larang.

Fodder is collected communally during autumn after harvesting of green and black pea and barley. Initially people collect fodder from agricultural fields around villages, followed by fodder collection from pastures. Main fodder species are *Trigonella*, *Cicer*, *Aconogonum* and *Festuca*.

Mushroom collection is common through summer, especially after a period of rain. People in small groups of 2-8 people collect mushroom for subsistence.

Medicinal plant collection is common in Pin Valley (Kala, 2000; 2005). Traditional medicine practitioners (*amchi / vaid*) collect medicinal plants for treatment of local people. There is widespread unscientific commercial extraction of threatened medicinal plants catering to high market demand for modern medicine industry and illegal cross-border trade (USL, 2011; Kala, 2005).

6.7 *Ecosystem services*

Ecosystem services are the contributions that ecosystems make to human well-being. A fundamental characteristic is that they retain a connection to the underlying ecosystem functions, processes, and structures that generate them.

Ecosystem services are divided into three sections provisioning, regulating, and cultural services.

- Provisioning services include all nutritional, material, and energetic outputs from living systems. It includes crop production, livestock production, collection of material etc.
- Regulating and maintenance include all the ways in which living organisms can mediate or moderate the ambient environment that affects human performance. These include pollination services, pest control, disease control, etc.
- Cultural services include all the non-material and normally non-consumptive, outputs of ecosystems that affect physical and mental states of people. These include sense of place, experiential use etc.

In each of these cases varying amounts of human input are required to provide these services. Services are valuable at different scales. Local ecosystem services are valuable locally for example collection of firewood; regional ecosystem services are used by people outside the point of origin of these services such as water used by people downstream; and global ecosystem services are services that are relevant globally, for example carbon sequestration.

Given below is a list of ecosystem services from Spiti Valley (Table 4). It also indicates whether they have local, regional, or global reach.

Table 5: An assessment of ecosystem services in Spiti Valley, Himachal Pradesh, India

Ecosystem Service Type	Services from Spiti Valley	Reach of services
Provisioning	Crops including Green pea, barley, apple, black pea, wheat.	Local
	Sheep and goat for wool, meat from all livestock except donkeys and horses, yak hair used to make ropes, cow and dzomo for milk, butter and cheese.	Local
	Wild onion as a spice, mushroom, and green leafy plants to eat.	Local
	Water for household and agricultural purposes. Snow-melt water for downstream users.	Local, regional
	Medicinal plants, plants for dyes, plants for roofing.	Local
	Animal dung as fertilizer, wild plants as fertilizer, collection of fodder.	Local
	Wood and animal dung for heat	Local
	Yak to plough the land, donkey to transport materials.	Local
Regulating	Storage by ecosystems, i.e, water storage pits built using soil and plants are allowed to grow around it for fresher storage of water. Irrigation channels also made using the same principle.	Local
	Clean air and clean water, i.e no pollution of air and water.	Local
	Control of soil erosion	Local
	Pest and disease control	Local
	Soil fertility	Local
	Good climatic conditions. Important for it to rain and snow at the right time.	Local and regional
Cultural	Tourism	Local, regional, and

Ecosystem Service Type	Services from Spiti Valley	Reach of services
		global
	Cultural heritage, traditional knowledge systems, knowledge of traditional Tibetan medicine passed down through generations.	Local, regional, and global
	Beautiful landscapes, wildlife and biodiversity	Local, regional, and global
	Sacred spaces around the villages, sacred plants used in religious ceremonies, and sacred animals.	Local, regional, and global
	Enjoyment provided by wild species and the landscape. Sense of peace.	Local, regional, and global
	Preserving nature for the future generations.	Local, regional, and global

Monetary value of ecosystem services from Spiti Valley

Spiti Valley has a population of around 12,000 people who use the local ecosystem services. Spiti being an agro-pastoral system, the local community depend directly on the ecosystem for provisioning services. In addition, transhumant pastoralists with a total of 55,000 to 80,000 livestock visit the region from Ladakh in the north and from the main Himalaya in the South. Some villages rent out pastures to the herders with grazing charges varying between 83US\$ to 1250US\$ (or 5395 INR to 81250 INR) for three months based on the size of the pasture and fodder quality. Around 40,000-50,000 tourists visit the valley every year to enjoy the stunning landscape, unique biodiversity assemblage, and the Buddhist cultural heritage. This number is rapidly increasing every year.

An economic valuation of all the provisioning ecosystem services from the Spiti Valley amounted to 3622 ± 149 US\$ HH⁻¹ yr⁻¹ (or 235430 ± 9685 INR HH⁻¹ yr⁻¹) to the local community (Murali *et al*, unpublished data). This was 3.8 times higher than the average annual household income (955 US\$ or 62075 INR; Revenue department, Kaza, Spiti Valley, 2014). The total value of the subsistence goods in Spiti Valley amounted to 2667 US\$ (or 173355 INR) per household, which was 2.8 times higher than the value of the commercial

goods produced. This indicates that the pasturelands in Spiti provide the local community with economic security.

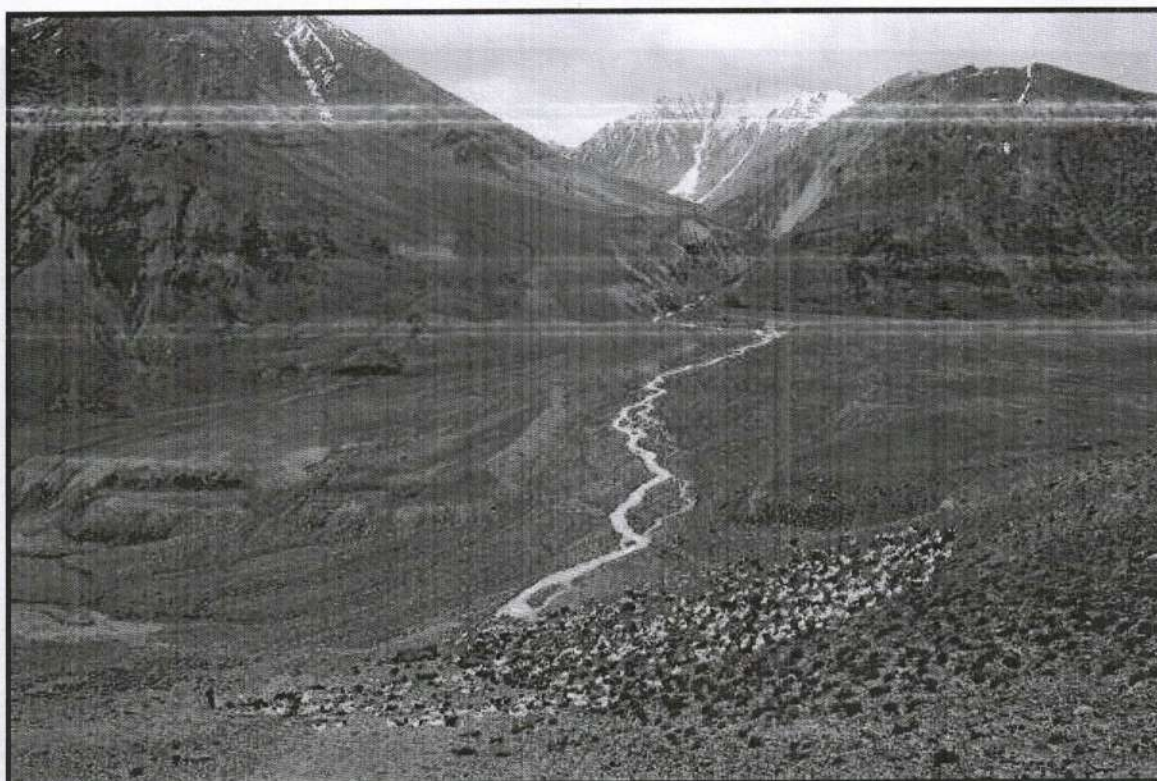
At a regional scale, water is an important ecosystem service from this valley. Mountain regions world over generally serve as important water towers (Viviroli *et al.*, 2007). The Spiti River is one of the two major rivers that drain into the Sutlej, an important river of the Indus basin that drains the fertile agricultural plains of North India and Pakistan (Gupta and Sah, 2008).

At a global scale, the unique biodiversity assemblage of Spiti Valley which includes the snow leopard, the blue sheep, ibex, and the Tibetan wolf, is of immense conservation value. It is recognized as an important landscape for snow leopard conservation (Snow Leopard Working Secretariat, 2013). Cultural services, such as the unique Buddhist cultural heritage (Handa, 2004), and scientific and educational value from rock art, and Bonpo cave paintings (Thakur, 2008), from the landscape are relevant at both regional and global scale.

Image 3: Sagnam (in the fore-ground) is the largest village in Pin Valley National Park, located at the confluence of the Pin and Parahio rivers. Khar, Mikkim, Kungri, Gulling and Upper Gulling villages are also seen in the image.



Image 4: Migratory livestock grazing is the most widespread and intense form of land-use in the Pin Valley National Park. A camp of a migratory herder is seen near confluence of Larang nala and Pin River.



7. Status of vegetation and wildlife

7.1 Vegetation

Vegetation of the Trans-Himalaya, in general, has much lower annual net primary production than the global average (Mishra *et al.*, 2010). Grazing by native wild-herbivores and domesticated livestock (local and migratory) is the main form of natural resource use in Pin Valley. Consumption of vegetation as forage by wild-herbivores and livestock is comparable to the global average despite below average vegetation production. A series of research on effects of livestock grazing on vegetation of Spiti have been carried out over the past two decades (Ghoshal *et al.*, *in review*; Bagchi, Bhatnagar & Ritchie, 2012; Bagchi & Ritchie, 2010; Suryawanshi, Bhatnagar & Mishra, 2010; Mishra, 2001). Spiti's pastures are in general overstocked by livestock and thereby degraded (Mishra, 2001). Vegetation cover and biomass are significantly depleted in areas intensely grazed by livestock (Ghoshal *et al.*, *in review*; Suryawanshi *et al.*, 2010; Mishra, 2001). Additionally, livestock grazing has strong impacts on lowering soil carbon sequestration (Bagchi & Ritchie, 2010) and plant species richness (Bagchi, Bhatnagar & Ritchie, 2012), with a preponderance of unpalatable plant species in intensely grazed areas (Ghoshal *et al.*, *in review*).

In addition to widespread livestock grazing, collection of plants for fuel, fodder and medicinal purposes is also common in Spiti (USL, 2011; Kala, 2000, 2005).

The arid landscape of Pin Valley supports open dry alpine steppe vegetation (Puri *et al.*, 1989; Champion & Seth, 1968) (Fig. 4), constituting mainly grasses and sedges like *Stipa*, *Elymus*, *Carex* and *Festuca* and dwarf-shrub steppe comprised mainly by *Caragana* and *Artemisia* (Chandra Sekar & Srivastava, 2009; Aswal & Mehrotra, 1994). Areas along streams and near glaciers have sedge-meadows formed primarily by *Kobresia* and *Carex*. A checklist of common grass, herb and shrub found in Pin Valley is given in Table 5. Vegetation of Pin Valley has numerous species of high medicinal value (Kala, 2005; Kala, 2000; Chandra Sekar & Srivastava, 2009).

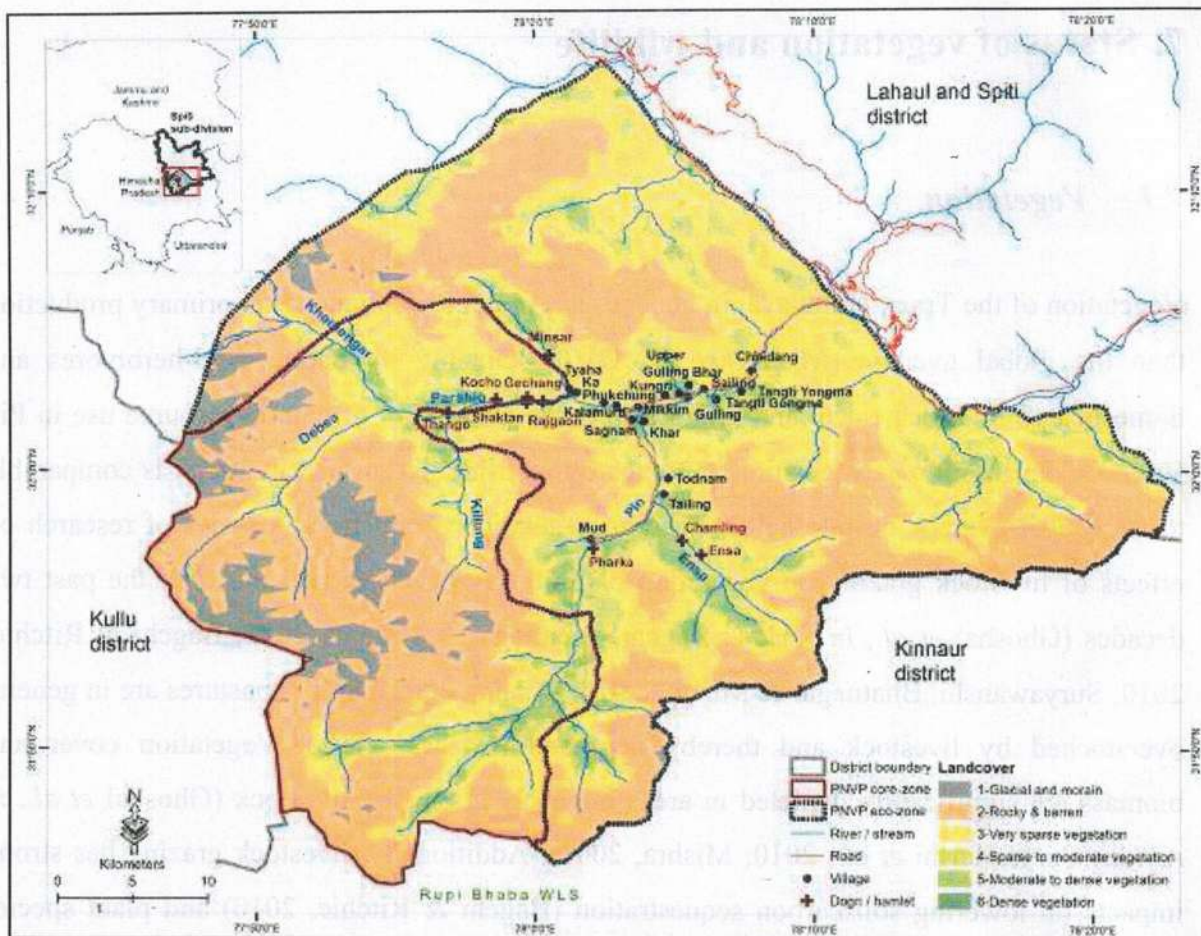


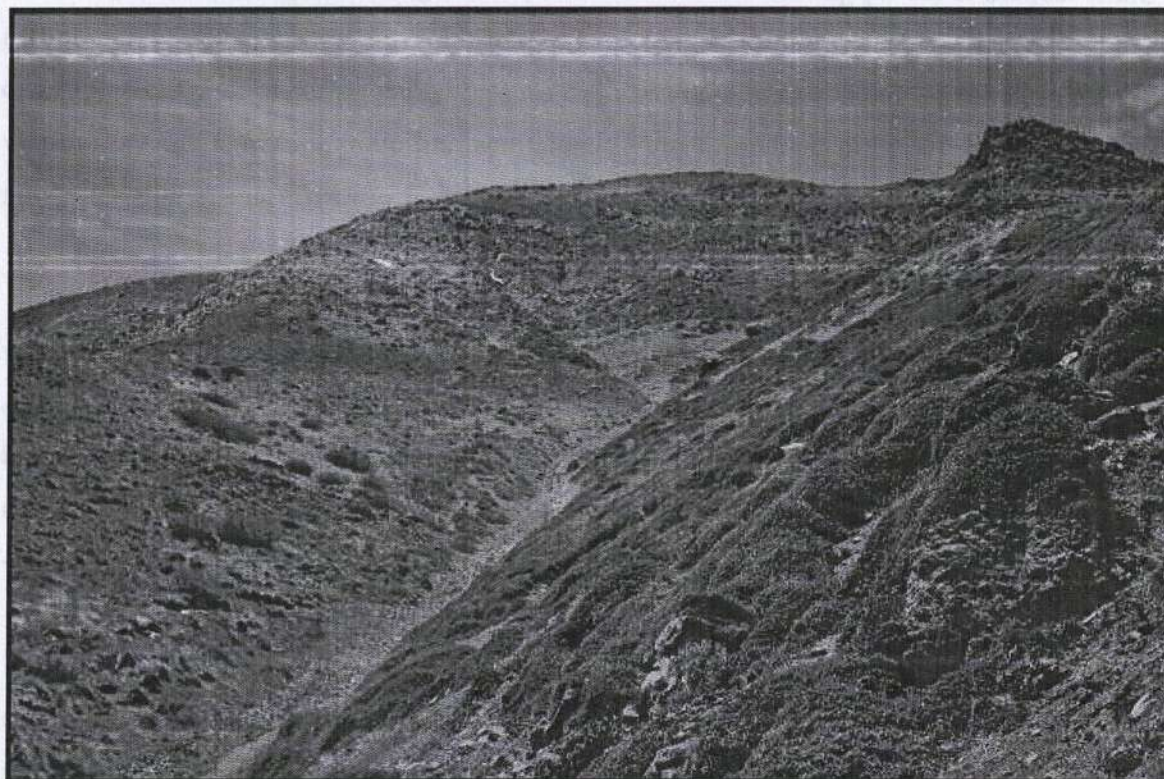
Figure 4: Land – cover features of Pin Valley National Park. The map shows majority of the national park to be rocky and barren, while dense, moderate and sparse vegetation is restricted largely along the valley bottoms.

Table 6: Some common species of tree, grass, herb and shrub reported in Spiti based on our vegetation sampling, Chandra Sekar & Srivastava, (2009) and Bagchi et al., (2004).

Group	Species	Family
Tree	<i>Betula utilis</i>	Betulaceae
	<i>Populus spp.</i>	Salicaceae
	<i>Salix spp.</i>	Salicaceae
	<i>Juniperus spp.</i>	Cupressaceae
Grass	<i>Stipa orientalis</i>	Poaceae
	<i>S. arabica</i>	Poaceae
	<i>Leymus secalinus</i>	Poaceae
	<i>Elymus mutabilis</i>	Poaceae
	<i>E. nutans</i>	Poaceae
	<i>E. russellii</i>	Poaceae
	<i>E. semicostatus</i>	Poaceae
	<i>Carex nivalis</i>	Cyperaceae
	<i>C. stenophylla</i>	Cyperaceae
	<i>Poa hylobates</i>	Poaceae
	<i>P. lahulensis</i>	Poaceae
	<i>Festuca kashmiriana</i>	Poaceae
	<i>F. valesiaca</i>	Poaceae
	<i>Piptatherum gracile</i>	Poaceae
	<i>P. munroi</i>	Poaceae
	<i>Calamagrostis stoliczkai</i>	Poaceae
	<i>Kobresia schoenoides</i>	Cyperaceae
Herb	<i>Astragalus spp.</i>	Fabaceae
	<i>Cousinia thomsonii</i>	Asteraceae
	<i>Lindelophia anchusoides</i>	Boraginaceae
	<i>L. longiflora</i>	Boraginaceae
	<i>Bupleurum candollei</i>	Apiaceae
	<i>Ephedra gerardiana</i>	Ephedraceae
	<i>Hieracleum thomsonii</i>	Apiaceae
	<i>Saussurea jacea</i>	Asteraceae
	<i>Crepis flexuosa</i>	Asteraceae
	<i>Scrophularia koelzii</i>	Scrophulariaceae
	<i>Aconogonum tortuosum</i>	Polygonaceae
	<i>Allium cepa</i>	Amaryllidaceae
	<i>Allium carolinianum</i>	Amaryllidaceae
	<i>Arnebia euchroma</i>	Boraginaceae
	<i>Anaphalis triplinervis</i>	Asteraceae
	<i>Artemisia spp.</i>	Asteraceae
	<i>Aster spp.</i>	Asteraceae
	<i>Bergenia stracheyi</i>	Saxifragaceae
	<i>Bistorta spp.</i>	Polygonaceae

Group	Species	Family
	<i>Cicer microphyllum</i>	Fabaceae
	<i>Eremurus himalaicus</i>	Asphodelaceae
	<i>Eurotia ceratoides</i>	Amaranthaceae
	<i>Geranium pratense</i>	Geraniaceae
	<i>Linum</i> spp.	Linaceae
	<i>Nepeta</i> spp.	Lamiaceae
	<i>Oxytropis</i> spp.	Fabaceae
	<i>Polygonum</i> spp.	Polygonaceae
	<i>Potentilla atrisanguinea</i>	Rosaceae
	<i>P. bifurca</i>	Rosaceae
	<i>Rhodiola tibetica</i>	Crassulaceae
	<i>Rumex</i> spp.	Polygonaceae
	<i>Saxifraga</i> spp.	Saxifragaceae
	<i>Scorzonera</i> spp.	Asteraceae
	<i>Silene</i> spp.	Caryophyllaceae
	<i>Thalictrum foetidum</i>	Ranunculaceae
	<i>Thymus</i> spp.	Lamiaceae
Shrub – dwarf shrub	<i>Ephedra gerardiana</i>	Ephedraceae
	<i>E. intermedia</i>	Ephedraceae
	<i>Caragana</i> spp.	Fabaceae
	<i>Ribes orientale</i>	Grossulariaceae
	<i>Rosa webbiana</i>	Rosaceae
	<i>Lonicera spinosa</i>	Caprifoliaceae
	<i>Myricaria</i> spp.	Tamaricaceae
	<i>Salix flabellaris</i>	Salicaceae

Image 5: Relatively lush vegetation is found only in a few parts of the Pin Valley national Park, e.g. deep inside Ensa nala, where human activities have been low due to long distances from village allowing higher density of ibex population.



7.2 Mammals

The top-predator of Pin Valley is the endangered snow leopard. Red fox and brown bear are co-predators of snow leopard in the landscape. Wolf is likely to be present in PVNP, however remains unconfirmed. Asiatic ibex is the large wild-ungulate in Pin Valley.

6.2.1 Snow leopard (*Panthera uncia*)

Snow leopard is the top-predator of the Pin Valley. Owing to its large territory requirement and role as top-predator, snow leopard is the 'flagship' for conservation of the Indian Himalaya under the Environment ministry's Project Snow Leopard. Retribution killing due to depredation on livestock, decline in prey populations and climate change are the primary threats to the snow leopard and its habitat. Developmental pressures are rapidly emerging across the snow leopard habitat.

Camera-trapping has been implemented by HPFD - NCF team to estimate density of snow leopard in Pin Valley (Fig. 5). Snow leopard density has been estimated at 0.53 (95% Confidence Interval 0.21 - 1.36) individuals /100 km². A report summarizing the methods and analyses for estimating snow leopard population is given in Appendix 4. Long-term monitoring of snow leopard population using non-invasive techniques such as camera-trapping is needed in Pin Valley to understand home-range and survival rates.

The Himachal Pradesh Forest Department has also embarked on a study to estimate the density of snow leopards across the entire range of snow leopard habitat in the State using similar camera trap surveys and deploying SECR techniques for estimation. The study will be completed between 2018 and 2020.

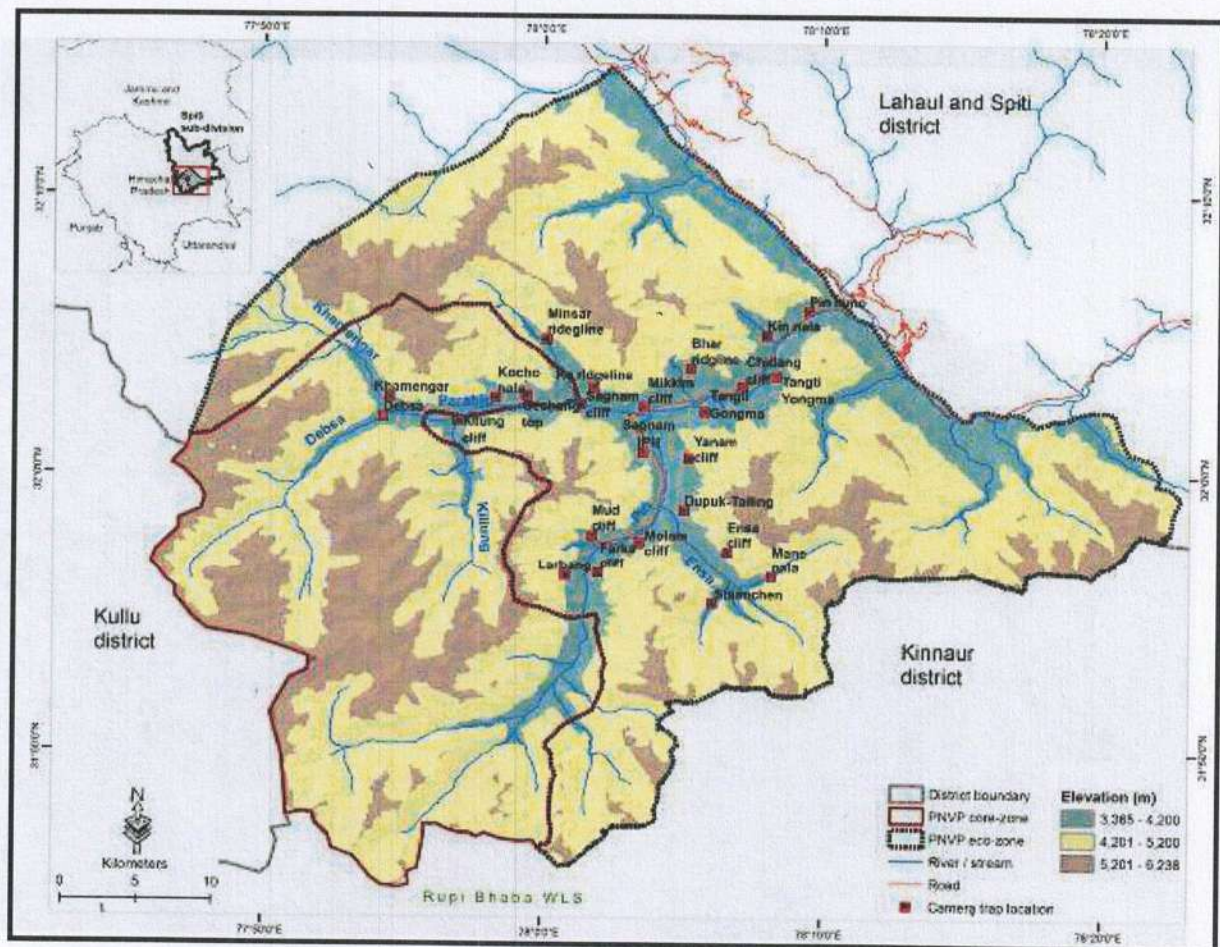


Figure 5: Locations of camera-traps installed during November - December, 2016, to estimate population of snow leopard in Pin Valley National Park.

Image 6: Camera-trap image of snow leopard from ridgeline above Gechang dogri in the Parahio catchment of Pin Valley National Park



6.2.2 Himalayan brown bear (*Ursus arctos isabellinus*)

Himalayan brown bears are found between 3,000m and 5,000m inhabiting alpine meadows and pastures above the treeline in Jammu and Kashmir, Himachal Pradesh and Uttarakhand. Brown bears have a uniformly brown coat and unlike most other bears, they do not have any markings on their body. They are known to hibernate in winter. Himalayan brown bear is largely threatened due to persecution by herders to protect livestock. Extraction of fuel-wood and other non-timber forest products by humans and developmental activities continue to disturb brown bear habitat. Brown bear is occasionally poached for their skin and gall-bladder.

Brown bear was reported in Pin Valley by local people in 2013. Initially reports of brown bear raiding dogris came from Rajgaon, Shaktan and Gechang dogris along Parahio River. Later brown bear attack on a hut near Sagnam village was reported in 2015. Our surveys in Ensa Valley in 2015 showed presence of potential brown bear scats across the valley (Fig. 6). A team sighted a mother with two cubs in Shian nala, one of the left bank tributaries of Ensa nala. There is an urgent need to understand distribution, forage availability and diet of brown bear to develop insights for mitigating and managing bear-human interactions in Pin Valley. Depending on the intensity of bear-human interactions conservation interventions such as solar-power fencing in areas facing bear attacks/raids might be necessary.

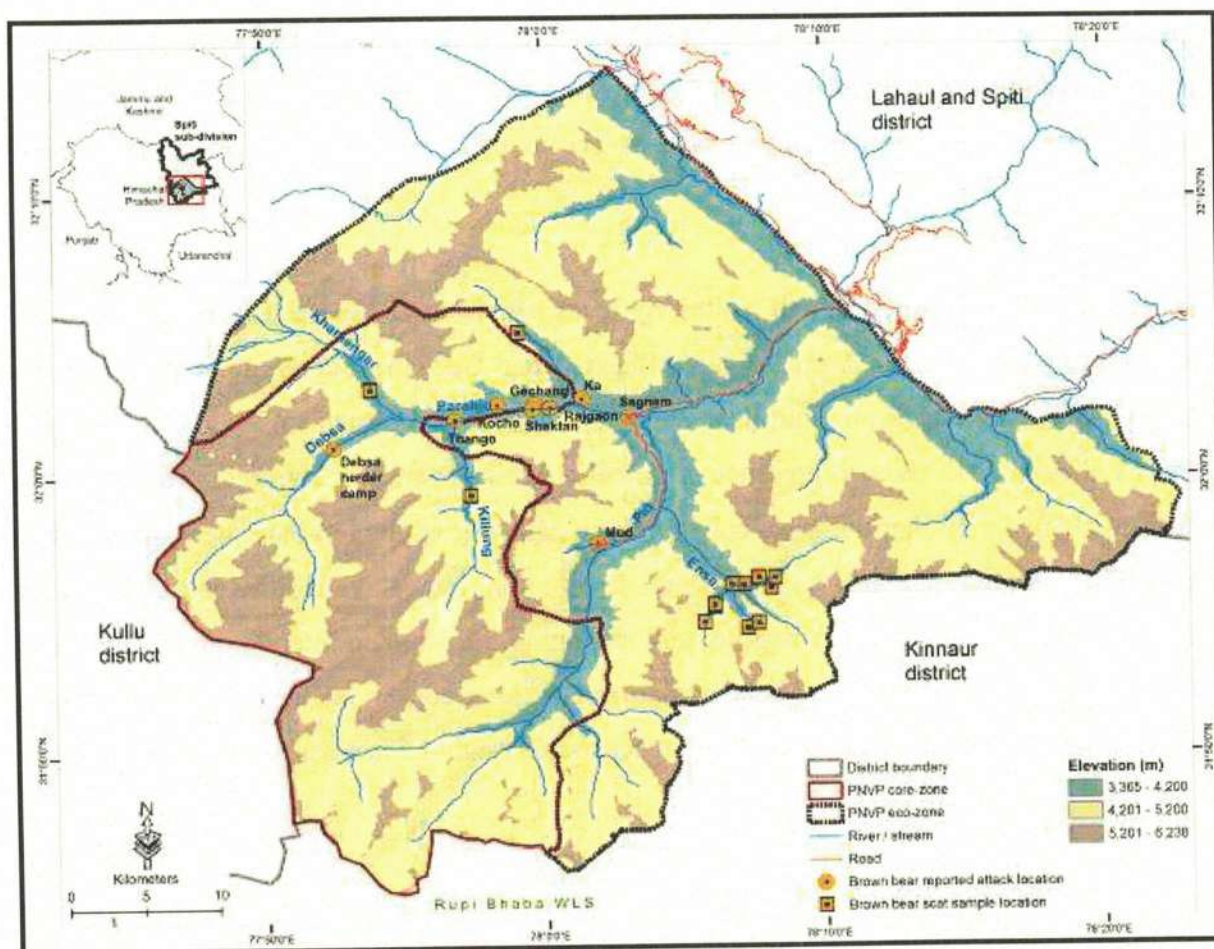
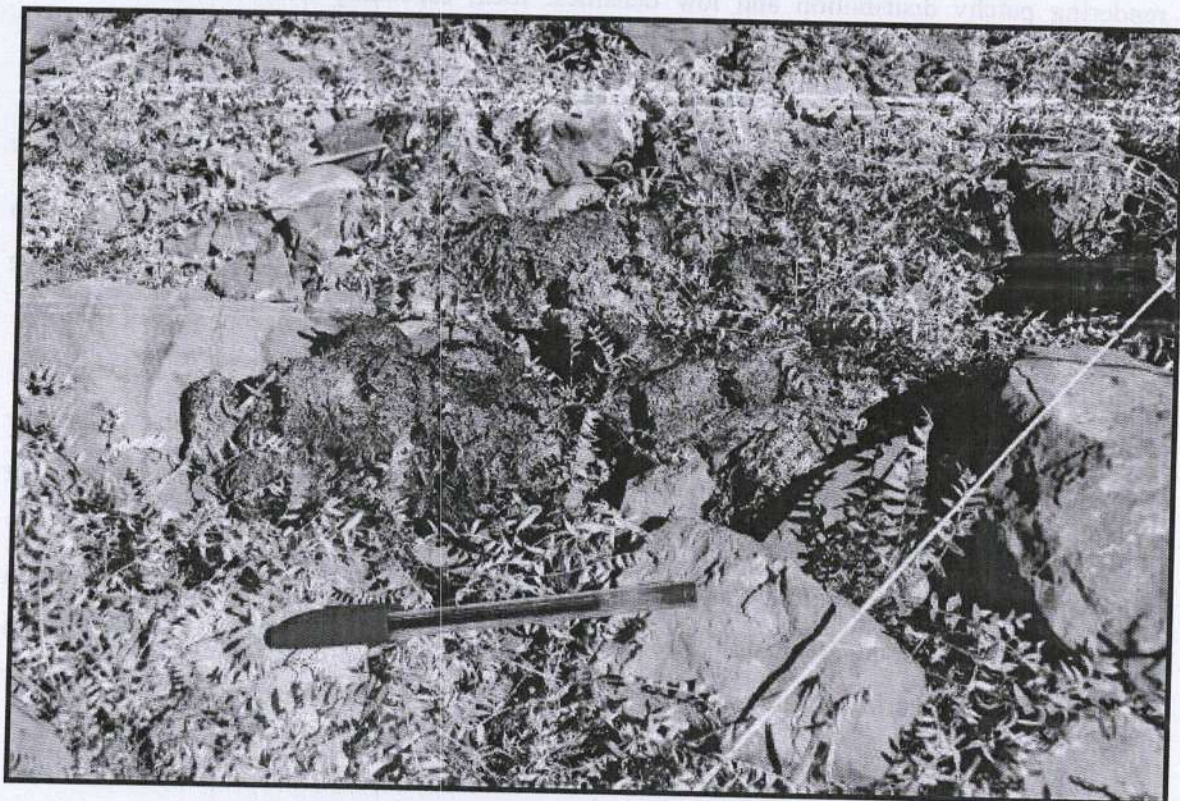


Figure 6: Locations of potential brown bear scat samples collected from Pin Valley National Park. Locations of brown bear attacks as reported by local people are also shown in the map.

Image 7: Potential scat of brown bear found deep inside Larsa nala (way towards Larsa We Pass) in Ensa Valley during October, 2015.



6.2.3 Asiatic ibex (*Capra sibirica*)

Ibex is one of the primary wild-prey of snow leopard, found in rugged and cliff-dominated areas above 3,000m altitude. In India, ibex occurs only in Jammu & Kashmir and Himachal Pradesh, not reported in areas east of the Sutlej River. Similar to bharal or blue sheep *Pseudois nayaur*, ibex also faces competition from domestic livestock, and is vulnerable to diseases transmitted from livestock. Ibex distribution range faces particularly high migratory livestock grazing pressure that has restricted ibex populations to sub-optimal habitat, rendering patchy distribution and low densities. Ibex, especially adult males, with huge sweeping horns, are hunted for trophy and meat.

Mean home range size of ibex in Pin Valley has been reported to be $30.33 \pm 4.5 \text{ km}^2$ (Bhatnagar, 1997). Ibex population monitoring is going on in Pin Valley since seven years to better understand long-term population dynamics, e.g. age-sex ratios, survival rates. There are 200-250 ibex in Pin Valley with some variation in estimates across different years (Table 6). Density of ibex is low in Pin Valley, estimated to be 0.45 ibex individual km^{-2} . Bagchi *et al.* (2004) showed evidence of strong interference competition between ibex and migratory livestock. Ibex was displaced from pastures where migratory livestock grazed. An ongoing study (Ghoshal *et al.*, *in review*) shows ibex density to be significantly lowered by migratory livestock grazing through reduction in forage availability. Some of the key areas for ibex in Pin Valley are Kin nala, Gechang – Kidul chu ridgeline, Kocho nala, slopes around Thango and Ensa Valley. During winter, ibex can be spotted near Gechang and Thango dogries, cliff opposite Tailing village on left bank of Pin River and around Mud village.

Table 7: Population estimates of Asiatic ibex in Pin Valley National Park based on long-term population monitoring using double-observer survey method. Lower and upper bounds represent 95% Confidence Intervals around the population estimates.

Year	Estimated population	Lower bound	Upper bound
2010	198	107	329
2011	211	117	352
2012	279	203	364
2013	187	128	262
2014	278	208	344
2015	192	122	274
2016	224	159	315

Image 8: Asiatic ibex densities are low in the Pin Valley National Park. Ibex face strong interference and exploitative competition from migratory livestock grazing within the national park. Here a herd of ibex females with yearlings is seen in Chhohem in Parahio catchment, deep inside core area of the national park.



6.2.4 Wolf (*Canis lupus*)

Wolf is an important predator in the Himalayas, co-occurring with the snow leopard. In addition to large ungulates, wolves prey upon smaller mammals, such as hare, marmot and pika, occasionally scavenging on snow leopard kills and garbage. A pack of wolf may have large home-range, traveling long distances in search of prey and shelter, usually hunting in open, rolling habitats. Wolf often comes into conflict with local communities due to depredation on livestock. Retribution killing continues to be a major threat to wolf populations. Widespread, yet patchy distribution and relative rarity are major challenges to studying and monitoring wolf.

Distribution and status of wolf needs to be assessed in Pin Valley. Based on our field-observations during surveys to estimate population of ibex throughout Pin Valley over six years, certain areas appear to be potential habitat for wolf; Ensa Valley (especially right bank of Ensa nala, area contiguous with Lippa-Asrang Wildlife Sanctuary of Kinnaur and Shinsa nala on way to Mane village; wolf has been known to occur around Mane); Baldhar area upstream Mud on right bank of Pin River, this area offers lush pastures and rolling terrain; Chhohem and Lal nala areas and Minsar or Kidul Chu area in Parahio catchment also offer extensive rolling terrain.

6.2.5 Red fox (*Vulpes vulpes*)

Red fox is the most widespread Carnivore species globally, occurring usually above 2,000m altitude across the Himalayas. A wide variety of food, such as small rodents, other small mammals, insects, worms, eggs, birds, fruit, scavenging the remains of prey killed by larger carnivores and also household waste constitute diet of red fox. Although versatile and apparently resilient to disturbances, intense human activity and competition with non-native predators, such as feral dogs (stray dogs depending largely on wild animals for survival), appear to be the major threats to red fox populations. Red fox is vulnerable to disease transmission from dogs.

Red fox is seen around villages in Pin Valley. There hasn't been any documentation of distribution and status of red fox population. Competition with feral dogs needs to be assessed as Pin Valley has considerable presence of dogs.

Small mammals confirmed in the PVNP are pika (*Ochotona* spp.) and vole (*Alticola* spp.). These small mammals serve as important regulators of vegetation characteristics, such as plant diversity and productivity. They are excellent indicators of climate change owing to relatively small home range sizes and rapid reproduction rates. Presence of weasel (*Mustela* spp.), otter (*Lutra* spp.), marten (*Martes* spp.), marmot (*Marmota* spp.) and hare (*Lepus* spp.) remain unconfirmed.

7.3 Avifauna

PVNP is one of the 'important bird areas' in India with a rich diversity of birds (Table 7). The national park has a good population of golden eagles owing to the steep mountainsides, which provide ideal nesting sites for these raptors. Various rosefinches were seen throughout Pin Valley. Almost every place in the valley with good number of willow trees (*Salix* sp.) had a sizeable population of common rosefinches. Such willow stands were commonly seen on the banks of rivers. Rosefinches such as the great rosefinch and streaked rosefinch, which are usually found near rocky slopes at higher altitudes, were seen coming down to the stream banks. Streaked rosefinches were observed near flowing water at Tailing and Ka.

The Phasianidae family is also well represented in the National Park. It includes birds such as the Himalayan snowcock, chukar partridge and snow partridge. Some small glaciers in the region here which exist below 4,500m, provide ideal habitat for the rare snow partridge. A pair of snow partridge was observed at a glacier situated around 3,900m near Mud village. The rock strewn grassy periphery of this glacier and the cliff face on one side also supported some other interesting species including but not limited to red-fronted rosefinch, great rosefinch, Himalayan snowcock and wallcreeper.

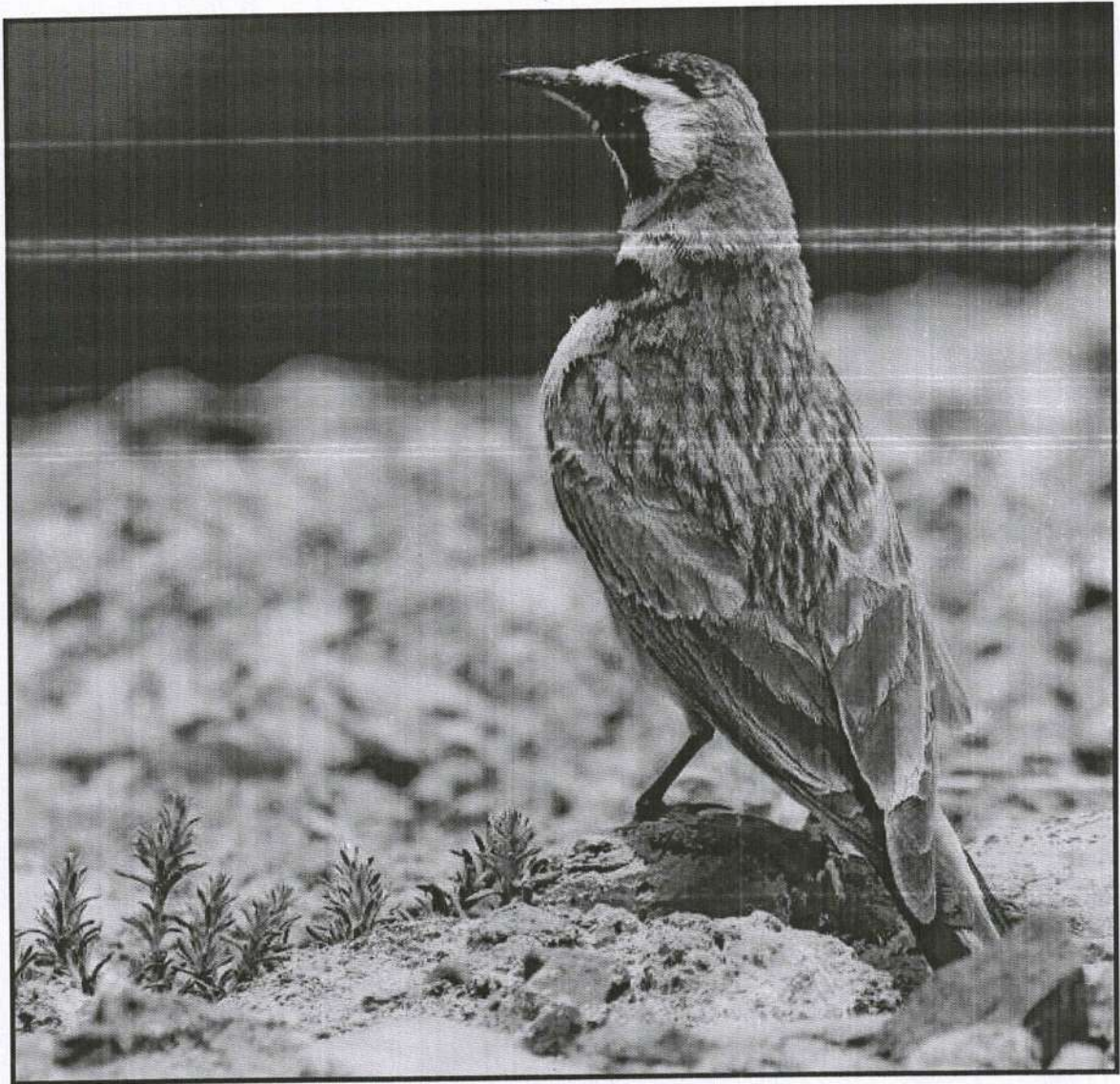
Warblers were abundant in the willow stands that flank the Parahio river inside the core area of PVNP. Apart from Hume's Leaf warblers and a few greenish warblers, an Ortolan bunting was observed at Kocho. Though this species has been recorded in Ladakh before, we believe that this is the first record of this species from Spiti valley.

Table 8: Birds recorded in the Pin Valley National Park based on primary surveys and existing literature.

Common name	Order	Family	Scientific name	IUCN Status
Golden eagle	Accipitriformes	Accipitridae	<i>Aquila chrysaetos</i>	Least Concern
Himalayan griffon	Accipitriformes	Accipitridae	<i>Gyps himalayensis</i>	Near Threatened
Bearded vulture	Accipitriformes	Accipitridae	<i>Gypaetus barbatus</i>	Near Threatened
Common hoopoe	Bucerotiformes	Upupidae	<i>Upupa epops</i>	Least Concern
Black winged stilt	Charadriiformes	Recurvirostridae	<i>Himantopus himantopus</i>	Least Concern
Green sandpiper	Charadriiformes	Scolopacidae	<i>Tringa ochropus</i>	Least Concern
Little stint	Charadriiformes	Scolopacidae	<i>Calidris minuta</i>	Least Concern
Common greenshank	Charadriiformes	Scolopacidae	<i>Tringa nebularia</i>	Least Concern
Hill pigeon	Columbiformes	Columbidae	<i>Columba rupestris</i>	Least Concern
Blue rock pigeon	Columbiformes	Columbidae	<i>Columba livia</i>	Least Concern
Snow pigeon	Columbiformes	Columbidae	<i>Columba leuconota</i>	Least Concern
Common kestrel	Falconiformes	Falconidae	<i>Falco tinnunculus</i>	Least Concern
Himalayan Snowcock	Galliformes	Phasianidae	<i>Tetraogallus himalayensis</i>	Least Concern
Chukar Partridge	Galliformes	Phasianidae	<i>Alectoris chukar</i>	Least Concern
Snow partridge	Galliformes	Phasianidae	<i>Lerwa lerwa</i>	Least Concern
Yellow-billed chough	Passeriformes	Corvidae	<i>Pyrrhocorax graculus</i>	Least Concern
Wallcreeper	Passeriformes	Tichodromadidae	<i>Tichodroma muraria</i>	Least Concern
Eurasian crag martin	Passeriformes	Hirundinidae	<i>Ptyonoprogne rupestris</i>	Least Concern
Hume's leaf warbler	Passeriformes	Phylloscopidae	<i>Phylloscopus humei</i>	Least Concern
Sulphur-bellied warbler	Passeriformes	Phylloscopidae	<i>Phylloscopus griseolus</i>	Least Concern
Mountain chiffchaff	Passeriformes	Phylloscopidae	<i>Phylloscopus sindianus</i>	Least Concern
Black redstart	Passeriformes	Muscicapidae	<i>Phoenicurus ochruros</i>	Least Concern
Tibetan snowfinch	Passeriformes	Passeridae	<i>Montifringilla adamsi</i>	Least Concern
Twite	Passeriformes	Fringillidae	<i>Linaria flavirostris</i>	Least Concern
Common rosefinch	Passeriformes	Fringillidae	<i>Carpodacus erythrinus</i>	Least Concern
Streaked rosefinch	Passeriformes	Fringillidae	<i>Carpodacus rubicilloides</i>	Least Concern
White wagtail	Passeriformes	Motacillidae	<i>Motacilla alba</i>	Least Concern
Rock bunting	Passeriformes	Emberizidae	<i>Emberiza cia</i>	Least Concern
Northern house martin	Passeriformes	Hirundinidae	<i>Delichon urbicum</i>	Least Concern
Greenish warbler	Passeriformes	Phylloscopidae	<i>Phylloscopus trochiloides</i>	Least Concern
Tickell's leaf warbler	Passeriformes	Phylloscopidae	<i>Phylloscopus affinis</i>	Least Concern
Grandala	Passeriformes	Turdidae	<i>Grandala coelicolor</i>	Least Concern
House sparrow	Passeriformes	Passeridae	<i>Passer domesticus</i>	Least Concern
Plain mountain finch	Passeriformes	Fringillidae	<i>Leucosticte nemicola</i>	Least Concern
Fire-fronted serin	Passeriformes	Fringillidae	<i>Serinus pusillus</i>	Least Concern
Great rosefinch	Passeriformes	Fringillidae	<i>Carpodacus rubicilla</i>	Least Concern

Common name	Order	Family	Scientific name	IUCN Status
Red-fronted rosefinch	Passeriformes	Fringillidae	<i>Carpodacus puniceus</i>	Least Concern
Citrine wagtail	Passeriformes	Motacillidae	<i>Motacilla citreola</i>	Least Concern
Ortolan bunting	Passeriformes	Emberizidae	<i>Emberiza hortulana</i>	Least Concern

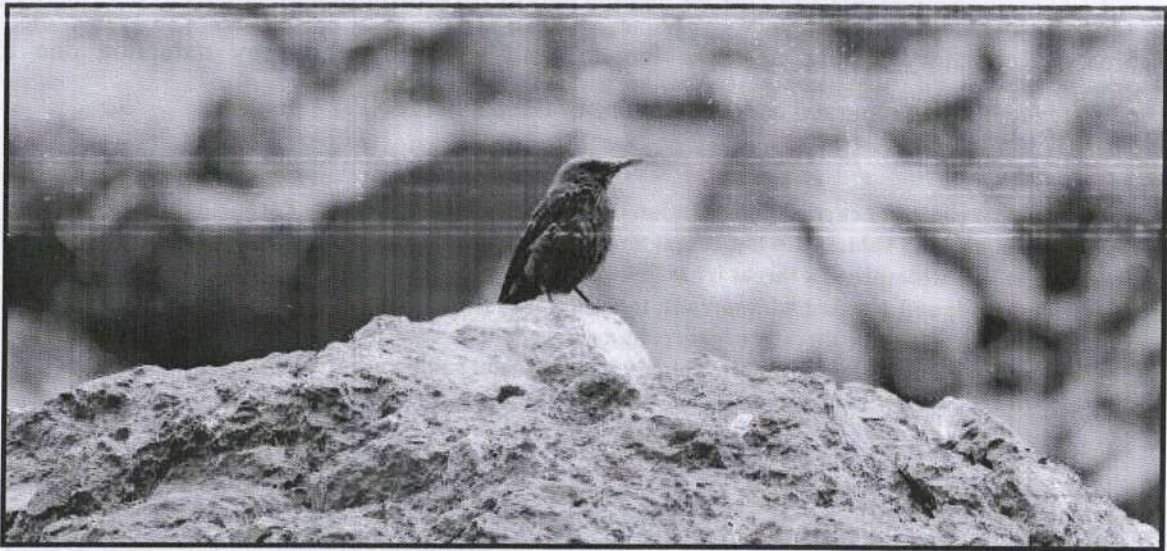
Image 9: A horned lark seen near Thango dogri in the Parahio catchment



3. Assessment of Impact

The identified and ranked extent conservation threats to PVP, based on their intensity and frequency (Table 4), have reduction due to a combination with migratory livestock destruction of wildlife & livestock by free-ranging dogs, impacts of road on snow leopard habitat and natural resources are by migratory herder community and tourism activities emerged as severe threats in PVP. Free reduction due to a combination with local livestock, free reduction due to disease from livestock, wildlife trade, herbivorous forest wood collection, herbivorous

Image 10: A blue rock thrush seen near confluence of Kidul chu and Parahio River.



Threat	Rank	Frequency	Intensity	Extent
Herbivorous	1	1	1	1
Free reduction due to a combination with migratory livestock	1.1	1	1	1
Free reduction due to a combination with local livestock	1.2	1	1	1
Free reduction due to disease from livestock	1.3	1	1	1
Wildlife trade	2	1	1	1
Herbivorous forest wood collection	2.1	1	1	1
Herbivorous forest wood collection	2.2	1	1	1
Herbivorous forest wood collection	2.3	1	1	1
Herbivorous forest wood collection	2.4	1	1	1
Herbivorous forest wood collection	2.5	1	1	1
Herbivorous forest wood collection	2.6	1	1	1
Herbivorous forest wood collection	2.7	1	1	1
Herbivorous forest wood collection	2.8	1	1	1
Herbivorous forest wood collection	2.9	1	1	1
Herbivorous forest wood collection	3	1	1	1
Herbivorous forest wood collection	3.1	1	1	1
Herbivorous forest wood collection	3.2	1	1	1
Herbivorous forest wood collection	3.3	1	1	1
Herbivorous forest wood collection	3.4	1	1	1
Herbivorous forest wood collection	3.5	1	1	1
Herbivorous forest wood collection	3.6	1	1	1
Herbivorous forest wood collection	3.7	1	1	1
Herbivorous forest wood collection	3.8	1	1	1
Herbivorous forest wood collection	3.9	1	1	1

8. Assessment of threats

We identified and ranked extant conservation threats in PVNP based on area, intensity and urgency (Table 8). Prey reduction due to competition with migratory livestock, depredation of wildlife & livestock by free-ranging dogs, impacts of road on snow leopard habitat and natural resource use by migratory herder community and immigrant labourers emerged as severe threats in PVNP. Prey reduction due to competition with local livestock, prey reduction due to disease from livestock, wildlife trade, fodder/dung/fuel wood collection, medicinal plant collection, unregulated tourism (off-roading/camping/hiking in wilderness, garbage mismanagement) and climate change and its effects on rangelands were intermediate threats. Retaliatory killing of snow leopard and wild-prey and prey reduction due to subsistence hunting emerged as low category of threats in PVNP.

Table 9: Assessment of current conservation threats in Pin Valley National Park, Himachal Pradesh, India. Threat ranking values: 1 = low threat level; 2 or 3 = intermediate threat level; 4 or 5 = high threat level. Area: how widespread a threat is? Is it present across large areas or limited to a few portions (5 = most widespread; and 1 = least widespread); intensity: how serious/severe is a threat (5 = the most severe threat; 1 = the least severe threat); urgency: immediacy of a threat. How immediate/urgent is the threat (5 = most urgent; and 1 = least urgent). Colour shades in total ranking score: light grey – low threat level, grey – intermediate threat level and dark grey – high threat level.

Sl.No	Threat categories & heads	Area	Intensity	Urgency	Total ranking
1	Livestock grazing				
1.1	Prey reduction due to competition with migratory livestock	4	5	3	12
1.2	Prey reduction due to disease from livestock	2	3	3	8
1.3	Prey reduction due to competition with local livestock	2	3	2	7
2	People-wildlife interactions				
2.1	Wildlife trade	1	3	3	7
2.2	Retaliatory killing of snow leopard and wild-prey	1	1	3	5
2.3	Prey reduction due to subsistence hunting	1	1	3	5
3	Direct/indirect human disturbances				
3.1	Depredation of wildlife & livestock by free-ranging dogs	4	3	3	10
3.2	Impacts of roads on snow leopard habitat	3	3	4	10
3.3	Natural resource use by migratory herder community & immigrant labourers	4	3	3	10
3.4	Fodder/dung/fuel wood collection	4	3	2	9

Sl.No	Threat categories & heads	Area	Intensity	Urgency	Total ranking
3.5	Medicinal plant collection	4	3	2	9
3.6	Unregulated tourism (off-roading/camping/hiking in wilderness, garbage mismanagement)	2	2	2	6
4	Climate				
4.1	Climate change and its effects on rangeland	5	2	2	9

We describe the key conservation issues (dark grey shaded) in PVNP in the following:

8.1 *Prey reduction due to competition with migratory livestock*

Migratory livestock grazing was found to be widespread in Pin Valley (Fig. 3). The high altitude pastures of Pin and Parahio valleys are grazed by livestock herders from neighbouring Rup-Bhaba and Nichar areas of Kinnaur and Sarahan - Rampur area of upper Shimla District.

As mentioned earlier, a total of 55,000-60,000 livestock is grazed by 40-45 groups of herders each summer in Pin Valley. Coarse estimate of livestock density in *ca.* 160 km² of grazed pastures of PVNP is thus 366-400 livestock / km².

Research on impacts of migratory livestock grazing has shown lowered forage availability in intensely grazed areas (Ghoshal *et al.*, in review). There are evidences for interference and exploitative competition between migratory livestock and ibex, (Bagchi *et al.*, 2004; Ghoshal *et al.*, in review). As a result of outcompetition of ibex by livestock, their population is restricted to cliff-dominated areas with low density.

Migratory herders are accessing areas beyond those to which they hold traditional rights. Such areas include Shinsa nala in Ensa valley and pastures near Mud. Migratory herders are passing through Pin Valley (Minsar nala) to access pastures around Rama and Langza villages in Spiti Valley.

Migratory shepherds are accompanied by guard dogs, primarily to protect livestock from depredation by native predators, such as common leopard *Panthera pardus*, bear *Ursus* spp.,

snow leopard and wolf. The guard dogs often chase and hunt native wild-ungulates e.g. ibex, and small mammals, e.g. pika. In 2015, there were a couple of reports of guard dog chasing away snow leopard that allegedly came close to a migratory herder's camp-site in Debsa.

8.2 Depredation of wildlife & livestock by free-ranging dogs

Free-ranging dogs are unattended dogs partly dependent on human habitations for food and may hunt in the wilderness. Guard dogs of migratory herders also contribute to local dog population and are almost exclusively associated with migratory herders for livestock protection. Often, two-three migratory shepherds graze their livestock in one area for a certain duration of time. This promotes division of labour and reduces individual vigilance effort. Such arrangements result in the aggregation of guard dogs at a camp-site. The dogs are generally aggressive in nature, and when in a pack pose a direct threat to snow leopard and its wild prey (ibex), to smaller mammalian species such as hare, marmot and pika and to ground dwelling birds such as pheasants and snow cock, through depredation and/or chasing. The guard dogs may also potentially be source of disease transmission to wild canids, such as the red fox and other native wildlife, and also humans.

Free-ranging dogs pose a direct threat to native wildlife through depredation on and chasing ibex, pika, voles and foxes. Large villages, such as Sagnam and Kungri, support considerable dog population. Monitoring and managing dog population is necessary in Pin valley to reduce impacts of this introduced predator on native fauna. Along with this, managing garbage is needed to reduce human-subsidies to dog. In Sagnam, a garbage management program has been initiated.

8.3 Impacts of road on snow leopard habitat

Pin Valley has a wide network of primary, secondary and tertiary roads, built under *Pradhan Mantri Grameen Sadak Yojna* and Public Works Department (PWD). Road primarily follows the Pin river and connects villages on both banks of the river. Road-head along Pin River is Mud, while road-head along Parahio River is Ka and Tyaha. Tractor-roads have been built connecting villages with dogris to carry crops, e.g. from Tailing village to Ensa dogri.

Upstream Mud, jeepable track has been carved out up to Larang and beyond, as part of the proposed road connecting Pin Valley with neighbouring Bhaba Valley of Kinnaur. This proposed road will cut through prime ibex and snow leopard habitat of PVNP that is already facing intense migratory livestock grazing.

Roads have opened up and brought about rapid changes (often development) in numerous hitherto remote areas of Himachal Pradesh, such as the Chandra Tal in Lahaul, Pangi Valley in Chamba and the high passes over 4,000m altitude, such as Shipki La (in Kinnaur), Kunzum La (in Spiti) and Baralachha La (in Lahaul). Roads have also introduced human disturbances in these important areas for the endangered snow leopard and its primary prey, such as ibex and bharal. Most areas along the roads, in addition to being manipulated and damaged, are sources of perpetual disturbance to native wildlife and rangeland vegetation owing to continuing construction and maintenance activities, labour camp-sites and hunting and fuel-wood collection by labourers for subsistence. Development in road network over the past two decades has perhaps facilitated improved marketing of cash-crops by local people, thereby rendering them the capability to employ immigrant labourers. Roads have also contributed towards establishment of hydro-electric projects and other infrastructure projects, which again engage large numbers of immigrant labourers.

While roads and infrastructure projects are necessary for development of these remote areas contiguous with international borders, poor planning and implementation, undermining local public opinion, lack of afforestation programmes and mismanagement of maintenance activities are some of the serious problems for wildlife conservation. Roads are also facilitating unregulated tourism deep into the snow leopard habitat including trekking, adventure sports and more recently, scientifically and ethically questionable snow leopard-centric camping and hiking activities.

8.4 *Natural resource use by migratory herder community and immigrant labourers*

Natural resource use is widespread in PVNP. In addition to natural resource use by local people, migratory herders and immigrant labourers extract natural resources, such as medicinal plants and fuel-wood. Both the groups of stakeholders are also reported to be involved in illegal trade in medicinal plants.

Migratory herders depend on fuel-wood for cooking and warmth during the two months of July-August. Their dependence is spread across upper Pin catchment (Shian – Baldhar areas to pastures on the way to Pin-Parvati Pass), Killung, Debsa, Khamengar and Chhohem nalas. Immigrant labourers are widespread in Pin Valley. The labourers come primarily from Nepal, Bihar, Jharkhand, Uttar Pradesh, West Bengal and Orissa. Immigration of labourers into Pin Valley began about 20-25 years ago following the advent of green-pea cultivation. Today, construction (roads and buildings), tourism (restaurants and road-side eateries) and household (agricultural, livestock herding and domestic help) are the primary sectors where large numbers of immigrant labourers are employed.

Immigrant labourers were reported to be associated with widespread natural resource extraction. Wildlife poaching using vehicle's gear/steering wire to prepare snare appears to be pervasive. Ibex, small mammals, such as pika, and birds, such as yellow-billed chough *Pyrrhocorax graculus* and rock pigeon *Columba livia* seem to be hunted for subsistence. Pheasants were also reported to be hunted for the commercially valuable plumage as well as subsistence. In addition to wildlife harvesting, immigrant labourers were consistently reported to be involved in commercial extraction of medicinal plants.

8.5 Climate change and its effects on rangeland

The mountains of Central and South Asia are prone to extreme and unpredictable weather conditions as a result of a changing climate (IPCC, 2007; SLN, 2014). In these mountainous ecosystems, intensity and frequency of catastrophic weather events are predicted to increase (ICIMOD, 2009). Future consequences of climate change in the greater Himalayan region, its glaciers, permafrost and the implications for water resources and ecosystems were reported by Xu *et al.* (2007). Glaciers in the Himalaya-Hindu Kush region have been mapped using satellite imagery and digital elevation models (Bajracharya & Shrestha 2011) so that changes in extent can be tracked.

An estimated 30% reduction in snow leopard habitat in the Himalayas is predicted due to an upward shift in tree - line and consequent shrinkage of the alpine zone over the next century (Forrest *et al.*, 2012). Another study predicted three climatically suitable large patches of areas in the Central Asia will account for about one-third of current global distribution of snow leopard through the late 21st century (Li *et al.*, 2016). At a finer scale, Aryal *et al.* (2014) reported 11% decline in grasslands and 42% decline in forests in Trans-Himalaya of Nepal.

Understanding effects of climate change on rangeland vegetation and wildlife continues to be a major challenge. Studies teasing apart impacts of climate change from other existing conservation threats, such as livestock grazing, is important. Interactions with the migratory herders revealed perceived degradation of pasture quality due to climatic changes, especially irregular rain and snowfall (Ghoshal *et al.*, in review). Untimely rain, cloud-bursts and reduced winter precipitation were reported to increase aridity of pastures and lead to increased frequency of soil erosion and land-slide over the past decade.

The global Snow Leopard Survival Strategy (SLN, 2014) has given the following recommendations to address the impacts of climate change in snow leopard habitat:

- Strengthening climate change policies nationally and internationally, including capacity building; regional watershed management and collaboration; and disaster risk management.
- Working with local communities in snow leopard range to assess climate change vulnerability and adaptive capacity.
- Sharing specific actions that local communities could take to adapt to climate change, ranging from community education (including drawing on traditional knowledge); natural resource and rangeland management and restoration to erosion control, desertification and water-resources conservation, etc.

Note:

The threat list is to be considered as dynamic and the assessment needs to be repeated every three to five years, as threats in an area are likely to be changing with time. Based on current assessment, prey reduction due to competition with migratory livestock, depredation of wildlife & livestock by free-ranging dogs, impacts of road on snow leopard habitat and

natural resource use by migratory herder community and immigrant labourers emerged as serious threats in the PVNP. Hence, this management plan proposes research and conservation activities to better understand and mitigate these four threats. Over the next few years, with implementation of this management plan, certain threats might be mitigated altogether, some might be downgraded owing to conservation interventions, others might continue to be of concern and new threats might emerge. During the next management planning exercise this threat assessment can be modified to redirect the research and conservation activities accordingly.

Understanding effects of climate change on trans-himalayan vegetation is a major challenge. Studies focusing spatial impacts of climate change from above existing conservation threats, such as livestock grazing in mountainous landscapes with the migratory herders revealed potential degradation of pasture quality due to climatic changes, especially irregular rain and snowfall (Ghoshal et al., in review). Unusually rain, cloud-bursts and reduced winter precipitation were reported to increase aridity of pastures and lead to increased frequency of soil erosion and landslides over the past decade. The Global Snow Leopard Survey Strategy (SLN, 2014) has given the following recommendations to address the impacts of climate change in snow leopard habitat:

- Strengthening climate change policies nationally and internationally, including capacity building, regional watershed management and collaboration and disaster risk management.
- Working with local communities in snow leopard range to assess climate change vulnerability and adaptive capacity.
- Identifying specific actions that local communities could take to adapt to climate change, ranging from community education (including drawing on traditional knowledge), natural resource and range management and restoration to erosion control, desertification and water resource conservation, etc.

The threat list is to be considered as dynamic and the assessment needs to be repeated every three to five years as threats in an area are likely to be changing with time. Based on current assessment, prey reduction due to competition with migratory livestock degradation of wildlife & livestock by free-ranging dogs, impacts of road on snow leopard habitat and

Part 2

The proposed management plan

While the effort to carry out camera trap surveys across the Pin Valley National Park will continue as an ongoing exercise, the Himachal Pradesh Forest Department has also conducted or is ready to initiate the survey of snow leopard tracks across the range of snow leopard habitat in the State using camera trap surveys and employing SIGR techniques for estimation. The study will be completed between 2018 and 2020 in collaboration with the Nature Conservation Foundation.

The first round of camera-trapping to estimate population density of snow leopards in the Pin Valley National Park was carried out during autumn 2016. Long-term snow leopard population monitoring will be continued at least on a bi-annual basis through the current management plan period by investing in required equipment for each exercise, building capacity within Forest Department staff and extending such exercises in coordination with agencies having relevant expertise in this subject.

Long-term ecological monitoring gives insights on functioning of an ecosystem. Long-term data can help track changes in density, survival rates of species of conservation importance (e.g. ibex and snow leopard), dynamics of vegetation, including changes in extent of pasture and the frequency of key fires. Monitoring programmes helps avoiding catastrophic decline in wildlife populations and provides early signals on changes in key factors (e.g. disease outbreaks, fires etc. (research numbers).

Long-term research objectives

Goal: To develop ecological understanding and conservation implication of key threats in the Pin Valley National Park

Research goal and objectives

9. Research goal and objectives

Goal: To develop ecological understanding and conservation implication of key threats in the PVNP

9.1 Long-term research objectives

Long-term ecological monitoring gives insights on functioning of an ecosystem. Long-term data can help track changes in density estimates and survival rates of species of conservation importance (e.g. ibex and snow leopard), dynamics of vegetation, including changes in extent of pastures and species composition, impacts of climate change and monitoring of key threat factors (such as population of local and migratory livestock). Systematic long-term monitoring programme helps avoiding catastrophic decline in wildlife populations and provides early signals on changes in key threats (e.g. pasture degradation, increase in livestock numbers).

8.1.1 Monitoring of snow leopard population

The first round of camera-trapping to estimate population density of snow leopards in the Pin Valley National Park was carried out during autumn, 2016. Long-term snow leopard population monitoring will be continued at least on a bi-annual basis through the current management plan period by investing in required equipment for such exercises, building capacity within Forest Department staff and executing such exercises in coordination with agencies having required expertise in this subject.

While the effort to carry out camera trap surveys across the Pin Valley National Park will continue as an ongoing exercise, the Himachal Pradesh Forest Department has also embarked on a study to estimate the density of snow leopards across the entire range of snow leopard habitat in the State using similar camera trap surveys and deploying SECR techniques for estimation. The study will be completed between 2018 and 2020 in collaboration with the Nature Conservation Foundation.

8.1.2 Monitoring of Asiatic ibex population

Long-term population monitoring of Asiatic ibex, the only large-herbivore in PVNP, is being carried out since 2010. This effort will be continued annually through the period of implementation of this management plan to track the changes in population of ibex in the PVNP.

8.1.3 Monitoring of rangeland vegetation

Changes in plant species composition, richness and productivity can be assessed through long-term monitoring of vegetation. Long-term experimental vegetation plots will be set up in PVNP, especially in areas intensely grazed by local and migratory livestock. This will help in monitoring changes in pasture quality and provide the information needed to mitigate pasture degradation.

8.1.4 Monitoring population and health of migratory livestock

A long-term monitoring of migratory livestock will track population changes, extent of grazing, shifts in grazing areas, incidences and impacts of livestock diseases. An ongoing study (Ghoshal *et al.*, in review) shows herd sizes of migratory herders coming into Pin Valley have nearly doubled over the past decade, with a considerable increase in goat numbers (Appendix 1). Data on livestock population and composition will be compiled periodically through the plan period. This information will be useful to relate changes in vegetation characteristics and wild-ungulate population.

9.2 Research objectives for prey reduction due to competition with migratory livestock

8.2.1 Understanding effects of migratory livestock grazing on vegetation and Asiatic ibex

Research on ecological impacts of migratory livestock grazing on vegetation and Asiatic ibex is ongoing (Ghoshal *et al.*, in review). Key results of this work showed significant lowering

of grass and herb availability and preponderance of unpalatable species in migratory livestock grazed area (Appendix 1). Availability of palatable species was 2.25 times higher in the ungrazed than grazed area. Ibex density was comparatively much lower in migratory livestock grazed than ungrazed area (Appendix 2). Yearlings in ibex population face strong interference competition from migratory livestock during peak summer (Appendix 2).

The impacts of migratory livestock grazing on changes in pasture quality remain poorly understood. Future studies in the landscape will be focused on changes in species composition (especially palatable versus unpalatable species) in intensely grazed versus moderately grazed and ungrazed areas. Effects of grazing on plant productivity and nutrient content will also be studied. Based on these understandings, areas rich in palatable species showing good productivity need to be identified to foster conservation of rangelands and ibex in PVNP (see section 9.1).

8.2.2 Understanding changes in migratory herding practices

Work on understanding changes in migratory grazing practice is ongoing. This work showed herd sizes of migratory livestock nearly doubled over the past decade (Appendix 3). The increase in herd sizes was accompanied by an increase in goat than sheep numbers in the herds (Appendix 3). Additionally, migratory herders are increasingly hiring labourers from outside the state. With considerable differences in culture, food habit and economic motivation, labourers are often reported by local people to be involved in hunting of wildlife for meat consumption, illegal trade in wildlife and medicinal plants. While long-term monitoring of changes in practices will allow documenting these factors, engaging with migratory herder community will be needed to address potential conservation issues (see section 9.4).

8.2.3 Understanding changes in pasture quality

Migratory herder community in Pin Valley perceived a decline in pasture quality over the past decade (Ghoshal et al., in review). They also perceived reduction in body-size and milk production of sheep-goat as a result of pasture degradation. These perceptions suggest 'overstocking' of the rangelands to the level that livestock productivity is compromised. This

makes understanding changes in pasture quality an important step as ibex population is also dependent on these pastures.

9.3 Research objectives for depredation of wildlife & livestock by free-ranging dogs

8.3.1 Assessing distribution and population of dog

Dogs have emerged as a serious conservation problem in the Indian Trans-Himalaya. The first step is to understand occurrences of dog in PVNP across seasons in areas around villages and in the wilderness. Understanding of distribution may be followed up by an assessment of dog population in the park using block counts.

8.3.2 Understanding effects of dog on native wildlife (competition, depredation and disease transmission)

Free-ranging dogs are non-native predators in the PVNP, with potential negative effects on birds, small and large mammals. In another part of Spiti, dog depredation on livestock has emerged to be a serious conservation issue (Ghoshal *et al.*, 2016; Home *et al.*, 2016) and surpasses depredation by snow leopard and wolf put together (Suryawanshi *et al.*, 2013). Dogs are also known to be competitors to smaller native carnivores like the red fox (Ghoshal *et al.*, 2016). Understanding ecological effects of dog on native wildlife and livestock will allow implementation of mitigation plan to control dog population in Pin Valley.

9.4 *Research objectives for impacts of road on snow leopard habitat*

9.4.1 Environmental impact assessment of area already affected and to be affected by proposed roads

Impacts of road construction and maintenance activities on Trans-Himalayan ecosystem are poorly understood. In addition to direct effects, such as habitat degradation and fragmentation and road mortality, indirect effects in the form of air pollution, debris deposition, hunting by road construction labourers need to be assessed.

9.4.2 Assessment of disturbance to rangeland vegetation and wildlife during road construction and maintenance activities

Studying variation in vegetation composition, cover and biomass along a gradient of distance from road will provide empirical information on how vegetation attributes in rangelands are influenced by road. Similarly, variation in detection, density and group-size of wildlife along a gradient of distance from road will provide understanding on how large mammals like ibex response to road.

9.5 *Research objectives for natural resource use by migratory herder community and immigrant labourers*

8.5.1 Understanding role of migratory herders and immigrant labourers in livelihood and economy of local people

With changes in socio-economy of local community, understanding their interface with other stakeholders in the park is important. For example, before the advent of green pea and use of chemical fertilizers, villagers depended on dung of sheep-goat of migratory herders. Increasingly, that dependence is declining owing to easy availability of chemical fertilizers. Now, village councils utilise pasture fee paid by migratory herders for community or religious works.

With labourers, increasingly they are involved in outdoor activities, e.g. resident livestock grazing, fodder and fuel-wood collection, as local people invest more time in agricultural activities. This exposes labourers to wilderness areas potentially allowing them to use natural resources for subsistence and commercial purposes.

8.5.2 Understanding impact of natural resource use by migratory herders and immigrant labourers on vegetation and wildlife

The role of migratory herders and immigrant labourers in illegal medicinal plant collection and hunting of birds, small and large mammals is believed to be considerable based on anecdotal reports from the local community. Assessing the impacts is needed to engage with these important groups of people spending two to nine months in and around the protected area.

9.6 Monitoring and evaluation

- Research objectives will be assessed, budgeted and implemented. Research on the threats will be prioritised based on threat ranking. Research on priority threats and long-term monitoring programs will be initiated within the first financial year of implementation of the management plan, while some components of the research will be carried out periodically.
- Evaluation of research projects may be based on annual reports.

10. Conservation management goal and objectives

Goal: To manage and/or mitigate impacts of key conservation threats in partnership with local stakeholders

10.1 Conservation objectives for prey reduction due to competition with migratory livestock

9.1.1 Reducing livestock grazing pressure

Given the strong ecological impacts of migratory livestock grazing on rangeland vegetation (significantly lowered grass and herb biomass and lowered availability of palatable forage in grazed area) and wild-ungulate population (lowered density of ibex through interference and exploitative competition and interference competition with ibex yearlings) ways to reduce grazing pressure on areas around the park need to be set in place.

As the first step, two areas, one in the Parahio catchment, while the other in Pin catchment will be focussed on. This will call for carrying our conversations with local community members and migratory herders to develop micro-plans that can help reduce grazing pressure in some of these areas.

Areas to focus on will be identified based on a combination of understanding of good ibex areas (e.g. slopes and ridgelines around Gechang, Kocho, Thango and Shirim, Kin nala) and inputs from local people and migratory herders on pastures facing degradation (e.g. pastures in Debsa, Chhohem and Lal nala in Parahio catchment and Baldhar, Larang areas in upper Pin catchment) (Fig. 7). Certain areas in Pin Valley (e.g. Shianchen nala in Ensa) are currently free of livestock grazing due to long distance from villages. Such relatively human activity-free areas must also be focused on.

Long-term plant monitoring may be implemented in these areas to document changes in plant composition, biomass and diversity. Existing ibex monitoring activity can be extended to these areas to document usage of reserves by ibex and their population trends in the reserves.

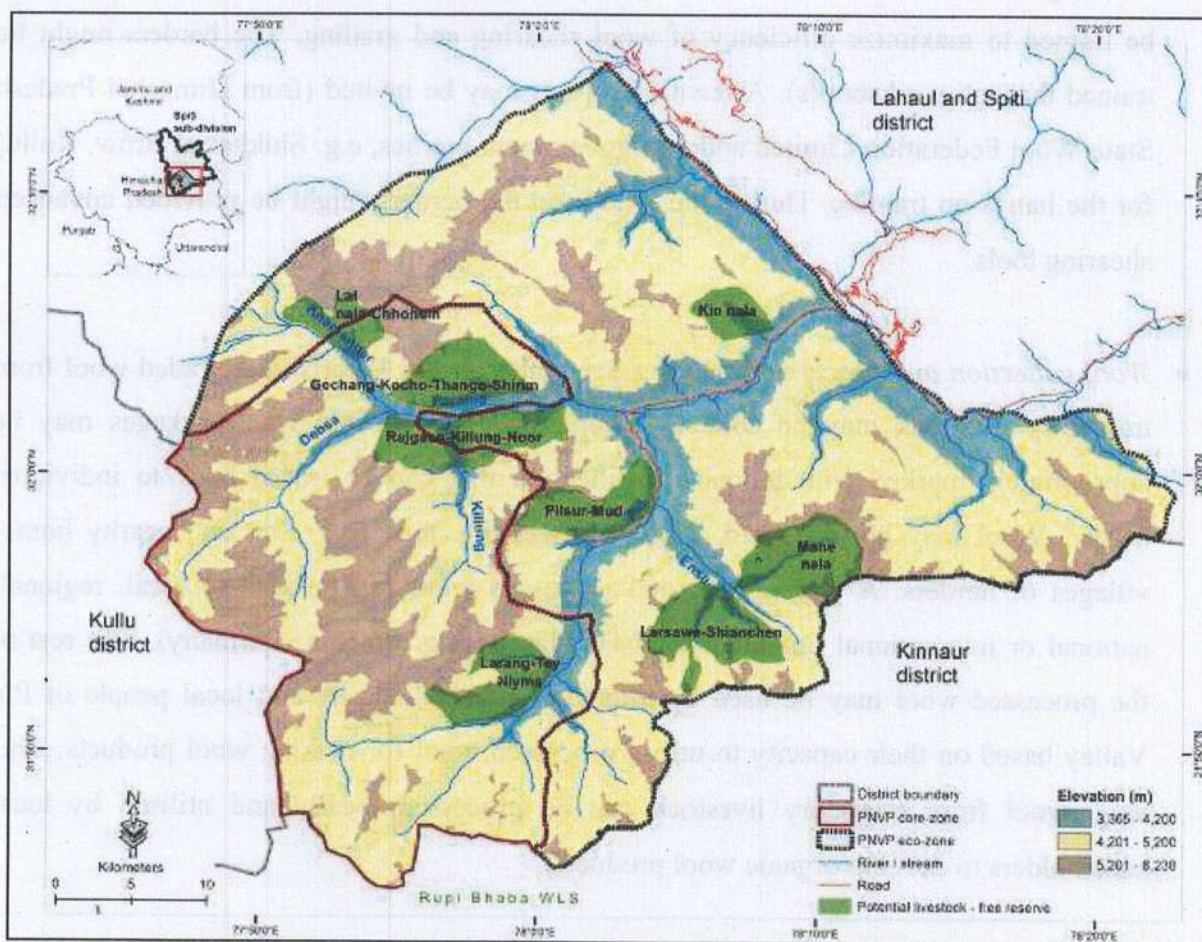


Figure 7: Potential areas to focus on around the Pin Valley National Park.

10.2 Reduce density of migratory livestock by engaging with migratory herder community to develop 'snow leopard friendly' livestock products

In addition to livestock-free community reserves, for the long-term conservation of Trans-Himalayan pastures, livestock density needs to be reduced through consultation with migratory herder community and local community. Exploring opportunities to improve and diversify organic livestock products is needed. Increasing indirect income from livestock could likely reduce migratory livestock herders' dependence on livestock numbers in the long-term, as currently their major source of cash income is through selling livestock.

The following steps may be adopted to engage with migratory herders:

- *Training to improve wool-shearing and grading:* The migratory herders of Pin Valley may be trained to maximize efficiency of wool shearing and grading. The herders might be trained through workshop(s). A team of experts may be invited (from Himachal Pradesh State Wool Federation Limited and non-government entities, e.g. Shikhar at Brow, Kullu) for the hands-on training. During the workshop the herders might be provided advanced shearing tools.
- *Wool collection and processing:* During September, better sheared and graded wool from migratory livestock may be collected (bought). The collected wool-packages may be appropriately marked with unique identification that can be traced back to individual herder. Wool may be processed at local processing units (e.g. Shikhar) nearby home-villages of herders. A part of the total processed wool can be sold to local, regional, national or international organic wool-based entity (e.g. Prolana, Germany). The rest of the processed wool may be used by migratory herders' family and local people of Pin Valley based on their capacity to utilise processed wool for making wool products. This way, wool from migratory livestock can be processed locally and utilised by local stakeholders to develop organic wool products.
- *Diversifying wool products:* Members from the migratory herder community and local people of Pin Valley accessing the training may be involved in preparing wool products. Local products from wool include shawl, blanket, men's coat, women's attire, sock and gloves. Better training may be provided to generate wool products that can be marketed in towns and cities. Better packaging, branding and marketing have the potential to substantially increase family-income of participants from livestock products. The finished organic wool products from migratory herders and local people of Pin Valley may be bought by local, regional, national or international organic wool-based government or non-government agency.
- Milk and meat products of migratory herder community also have high potential for diversification, better packaging and marketing. Milk products include yoghurt, butter, clarified butter and cheese. Meat products might be frozen meat, sausage and salami. The Himachal Pradesh State Cooperative Milk Producers Federation Limited and the Department of Industries, Government of Himachal Pradesh, may be involved to facilitate training to improve products, quality control, packaging, branding and marketing.

Potential local markets for livestock products might be Rampur, Reckong Peo, Kaza, Shimla, Manali, Kullu and Mandi, while distant markets might be Delhi, Chandigarh and Dehradun.

10.3 Conservation objectives for depredation of wildlife & livestock by free-ranging dogs

10.3.1 Garbage management

Unmanaged garbage dumps (especially disposal of livestock carcasses) are believed to be a major food source for dog populations in human habitations (USL, 2011; Ghoshal *et al*, 2016). In every village, segregation of waste at source and their effective disposal at a designated garbage site is needed. The garbage site needs to be appropriately fenced to prevent access to dogs. A garbage management program has been implemented in Sagnam. Other large villages in PVNP, as Kungri and Mud may also be brought within this garbage management program.

10.3.2 Dog sterilization

Along with garbage management, dog population needs to be controlled. Systematic dog sterilization program may be undertaken in all villages of PVNP. HPFD (Wildlife Wing) has already been working with the Animal Husbandry Department in Kaza in running a dog sterilization program in a number of villages of Spiti, e.g. Kaza, Rangrik and Lossar. This program will be introduced in villages of PVNP in collaboration with local community.

10.4 Conservation objectives for impacts of road on snow leopard habitat

10.4.1 Optimizing duration of road construction and effective implementation of road maintenance

Strengthen inter-departmental partnership to carry out better assessment of need for road, planning road while appreciating value of the landscape for wildlife conservation, effective implementation (strict timeline and adherence to zone of impact) of road construction and

maintenance activities. Road-workers may be involved in conservation activity to increase their support towards management of PVNP.

10.4.2 Maintain patrolling routes and inspection paths to prevent illegal extraction of natural resources

Repair of foot-bridges that have been destroyed by flash-floods (e.g. bridge across Kidul Chu below Ka) and construction of a few foot-bridges where necessary would be carried out (e.g. across Debsa, connecting Noor and Shirim; across Chhota- and Bara-Baldhar nals in Pin catchment upstream from Mud; across Pin River in Tey Niyma or Dumundhar pastures). These areas are currently extremely risky and time-consuming to access due to repeated river-crossing, especially during peak-summer. The foot-bridges will allow safe and speedy access to these areas for better foot-patrolling and survey/monitoring activities. Annual monitoring and maintenance of the foot-bridges will be needed.

10.5 *Conservation objectives for natural resource use by migratory herder community and immigrant labourers*

10.5.1 Awareness programme

Engaging with immigrant labourers in the landscape is important as the group is increasingly getting involved in activities such as local livestock grazing and fuel-wood collection. There is a need to organize meetings with labourers and their employers/contractors at respective villages to talk about wildlife values in the landscape from ecological and cultural perspectives.

An awareness programme may start with a basic 'Do's and Don'ts' pamphlet for labourers and employers/contractors written in Hindi and Spitian, outlining key wildlife, their values, wildlife laws and emphasizing the legal implications of violation. The 'Do's and Don'ts' may

be put up as sign-boards along roads and in large villages with considerable number of immigrant labourers (e.g. Sagnam, Mud, Kungri, Tailing and Gulling).

Awareness efforts will also include putting up signages that can sensitise locals and tourists about the landscape and wildlife found in these areas. Pamphlets will be published which will be handed out to visitors at the gate and entry points of the park.

10.5.2 Patrolling areas with labour camp-sites

Patrolling labour camp-sites in the wilderness will be important to monitor implementation of agreement guidelines and curb any illegal extraction of medicinal plants and poaching of wildlife.

10.5.3 Livestock health programme

Disease can take a toll on livestock that can lead to significant losses for local communities. Efforts to protect livestock against such losses can be beneficial to local communities and helpful in eliciting their support for conservation. Efforts in this case will include health camps for livestock, vaccinations, and construction of sheep dipping tanks to protect them from external infestation.

10.6 Monitoring and evaluation

- Conservation management objectives will be assessed, budgeted and implemented. Conservation management interventions will be prioritised based on threat ranking. Conservation interventions on priority threats will be initiated within the first financial year of implementation of the management plan.
- Evaluation of conservation management projects (may be linked with respective research project) may be based on six-monthly and annual reports.

11. Eco-tourism

PVNP is popular among tourists, trekkers and mountaineers. There is high potential to develop an eco-tourism initiative to strengthen support of local community towards conservation management of PVNP. Pin-Bhaba and Pin-Parvati Passes, Ensa and Parahio valleys are important trekking routes. Certain peaks in the Parahio Valley, e.g. Kangla Tarbo, attract mountaineering expeditions.

Eco-tourism activities may be restricted to the buffer zone of the PVNP.

Goal: Develop community-based responsible eco-tourism to improve community participation in conservation management and general appreciation of biodiversity

11.1 Assess tourism infrastructure

Existing facilities, e.g. trekker hut, bunkers, will need repairs. A few new basic facilities may be developed in villages. These facilities may be advertised on State government's website, local and regional newspapers and social media. Aesthetically designed sign-boards to strengthen awareness of tourists depicting key wildlife (including birds and plants) species and conservation issues of PVNP at the entry-point of Pin Valley (Attargu bridge) and along the main roads (such as at Gulling, Kungri, Mikkim, Ka and Mud) will be put up.

11.2 Nature interpretation centre

A nature interpretation centre can serve as the source of information on PVNP for tourists, trekkers and adventure enthusiasts. The interpretation centre may be developed in Sagnam, the largest village of Pin Valley. Sagnam remains accessible more or less throughout the year, barring short time periods during winter. Sagnam is also the base for mountaineering expeditions and trekking/camping activities into Parahio catchment.

Local people, especially school children and youth, might be trained and encouraged to participate in nature interpretation to visitors on a rotational basis. Maps, posters, brochures,

pamphlets and booklets on PVNP and its natural and cultural wealth may be kept in the interpretation centre for use by the interpreters and visitors.

11.3 Home-stay

There are existing home-stays in villages of PVNP, especially Mud. The owners of the home-stays might be encouraged to form a cooperative, maintaining basic standards of amenities, sanitation and hygiene. The department will support villagers towards developing infrastructure. The home-stays might be hosted on forest department's website to improve marketing. The cooperative might work out a way to equitably distribute visitors and improve profit sharing. Visitors' feedback might be recorded by each home-stay. The department may collect the feedback every year based on which rewards might be declared for top three best-performing home-stays. This way a constructive competitive atmosphere may be maintained with incentive to make the community home-stay initiatives work better. Such initiatives will empower local community and help develop support for conservation management.

11.4 Wildlife-tour and Trekking

PVNP is rich in vegetation, mammal and bird diversity. Local youth and school children can be trained in identifying common and important plants, animals and birds. This will help future custodians of PVNP to observe and appreciate the natural wealth of their surroundings. Plant, wildlife and bird-watching trails may be identified around villages to offer trail-walks for interested tourists. These tours may be conducted by the nature interpretation centre against a fee. The trained children and youth may be encouraged to guide visitors on short trail-walks for plants, wildlife- and bird-watching. The guides may be encouraged to record species at least once during each season while on these trail-walks to be documented as ecological data. The forest department and other science and conservation institutions might use the data for monitoring purposes. Visitors may be encouraged to provide feedback on their experience and on individual guides. Rewards might be declared for top three guides each year based on visitors' feedback. This way a constructive competitive atmosphere may be maintained with incentive to make the wildlife tours work better.

To implement eco-tourism activities the forest department will seek assistance from the state government's tourism department and/or experienced organizations working in Spiti.

11.5 Monitoring and evaluation

The overall responsibility of maintaining records on eco-tourism activities in a village will remain with the block officer or forest guard. The records may be submitted to the range office annually for neutral monitoring and evaluation.

- Status of eco-tourism infrastructures monitored annually to maintain basic standards and hygiene. Evaluation may be based on assessment of yearly turn-over from the facilities and feedback of visitors.
- Nature interpretation centres have to be monitored to develop resources on PVNP and improve facilities. Interpreters need to be continually trained. Evaluation may be based on number of local children and youth joining the initiative and yearly visitation of nature interpretation centres by tourists and their feedback.
- Home-stays need to be monitored to maintain basic standards and follow cooperative guidelines. Evaluation may be based on yearly visitation of tourists and feedback.
- Monitoring wildlife tour activities is important to ensure continued engagement of children and youth. Evaluation may be based on number of tours yearly conducted, number of checklists of plant, wildlife and birds submitted and feedback from visitors.

12. Budget

Currently, the Spiti Wildlife Division and Chandratul Wildlife Sanctuary receive funding through funds allocated under Centrally Sponsored Schemes (CSS) for the development of National Parks and Sanctuaries or protected areas. **The proposed budget for this management plan will be funded under two programs: CSS and Koldam.**

Increased funding is required for strengthening of infrastructure, development of eco-tourism, awareness generation and education activities etc. The budgetary requirement for the next ten years, i.e, from 2018-19 to 2027-28 has been categorized as explained in the following table.

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
I	Development of Pin Valley National Park											
A	Vehicle	10.00	-	-	2.00	-	10.00	-	-	2.00	-	24.00
B	Purchase of field equipment	0.50	0.50	0.60	-	0.75	0.75	-	-	1.75	1.00	5.85
C	Staff amenities	3.00	1.00	1.00	1.25	3.25	1.25	1.50	1.50	1.50	5.00	20.25
	Sub Total	13.50	1.50	1.60	3.25	4.00	12.00	1.50	1.50	5.25	6.00	50.10
II	Protected Area Management											
A	Boundary protection	5.75	1.75	1.75	2.00	2.00	6.00	2.25	2.25	2.25	2.50	28.50

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										Total
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	
B	Maintenance of road network	9.0	6.5	5.8	9.3	12.5	7.9	9.9	11.9	11.3	16.5	100.5
	Sub Total	14.75	8.25	7.55	11.30	14.50	13.90	12.15	14.15	13.55	19.0	129.00
III	Development of Responsible Eco Tourism											
	Sub Total	14.0	12.5	7.0	6.0	8.5	11.3	12.8	7.8	10.0	13.5	103.3
IV	Eco-Development											
	Sub Total	10.0	11.0	11.0	12.0	13.0	15.0	16.0	17.0	17.0	18.0	140.0
V	Research, Monitoring and Training											
	Sub Total	7.0	7.5	8.0	9.0	9.5	10.5	11.0	11.0	12.0	12.0	97.5
VI	Publicity & Awareness											
	Sub Total	2.0	1.0	2.0	1.5	2.5	1.5	2.0	4.0	2.0	4.5	23.0
VII	Establishment Costs											
	Sub Total	10.5	11.5	12.8	13.8	15.5	16.5	17.8	18.8	20.0	21.0	158.0
VIII	Maintenance of Permanent Assets at Pin Valley National Park											
	Sub Total	7.00	7.00	7.00	7.00	7.50	10.00	10.50	10.50	11.00	11.00	88.50

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										
		2018-19	2019-20	2020-21	2021- 22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
	Grand Total	78.75	60.25	56.85	63.75	75.00	90.65	83.65	84.65	90.75	105.00	789.3

Table 10: Summary of Budgeted Expenses over plan period (2018-28)

A broad activity-wise break-up of these budgeted expenses is provided in the following table.

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
I	Development of Pin Valley National Park											
A	Vehicle											
1	Purchase of vehicle to facilitate visits to Pin Valley National Park	10.0	-	-	2.0	-	10.0	-	-	2.0	-	24.0

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
	Sub Total	10.0	-	-	2.0	-	10.0	-	-	2.0	-	24.0
B	Purchase of field equipment											
1	Digital cameras	0.5	-	-	-	0.75	-	-	-	1.0	-	2.25
2	Binoculars	-	0.5	-	-	-	0.75	-	-	-	1.0	2.25
3	GPS and other equipment required for wildlife surveys and census	-	-	0.6	-	-	-	-	-	0.75	-	1.35
	Sub Total	0.50	0.50	0.60	0.00	0.75	0.75	0.00	0.00	1.75	1.00	5.85
C	Staff amenities											
1	Purchase of field equipment—walking shoes, jackets, head torches and sleeping bags.	1.0	1.0	1.0	1.25	1.25	1.25	1.5	1.5	1.5	2.0	13.25
2	Purchase of solar powered lanterns and dedicated solar unit	2.0	-	-	-	2.0	-	-	-	-	3.0	7.0

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
	for Forest Hut											
	Sub Total	3.00	1.00	1.00	1.25	3.25	1.25	1.50	1.50	1.50	5.00	20.25
II	Protected Area Management											
A	Boundary protection											
1	Survey and demarcation of wildlife National Park, beats, grazing pastures, enclosures etc	0.75	0.75	0.75	1.0	1.0	1.0	1.25	1.25	1.25	1.5	10.5
2	Installation and upkeep of general signage and boards	5.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	18.0
	Sub Total	5.75	1.75	1.75	2.00	2.00	6.00	2.25	2.25	2.25	2.50	28.50
B	Maintenance of road network											
1	Maintenance of road to Pin Valley	3.0	3.0	3.0	4.0	4.0	4.0	5.0	5.0	5.0	6.0	42.0

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
	National Park											
2	Maintenance of existing patrolling paths	2.0	2.0	2.0	3.0	3.0	3.0	4.0	4.0	4.0	5.0	32.0
3	Construction of culverts/ causeways	1.0	-	-	1.5	-	-	-	2.0	-	-	4.5
4	Identify and mark vantage points	-	1.0	0.3	0.3	1.5	0.4	0.4	0.4	1.8	0.5	6.5
5	Set up garbage collection and disposal arrangement in the National Park	3.0	0.5	0.5	0.5	4.0	0.5	0.5	0.5	0.5	5.0	15.5
	Sub Total	6.15	9.0	6.5	5.8	9.3	12.5	7.9	9.9	11.9	11.3	16.5
III	Development of Responsible Nature-based Eco Tourism											
A	Manage tourism at Pin Valley National Park											
1	Commission a study to assess tourism	-	5.0	-	-	-	-	6.0	-	-	-	11.0

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)

Sr. No.	Particulars of Work	Rs. In Lakhs										Total
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	
	carrying capacity, and develop responsible ecotourism strategy for Pin Valley National Park											
2	Construction of gate after the camping area and parking lot to prevent vehicular access after open hours	5.0	-	2.0	-	-	3.0	-	-	4.0	-	14.0
3	Demarcate areas for licenced operators to set up camp sites	2.0	-	-	2.0	-	-	2.0	-	-	2.0	8.0
4	Create nature trails for nature interpretation such as bharal trail, bird watching etc	-	3.0	-	-	3.0	-	-	3.0	-	3.0	12.0
5	Formation of	2.0	-	2.0	-	-	2.0	-	-	2.0	-	8.0

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)

Sr. No.	Particulars of Work	Rs. In Lakhs										Total
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	
	trekking paths											
6	Maintenance of trekking path	-	-	-	1.0	1.0	-	1.0	1.0	-	1.0	5.0
7	Lay out a waste disposal system around camp sites	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	10.0
8	Establish boards, signages for identification of flora and fauna	-	2.0	0.5	0.5	0.5	3.0	0.5	0.5	0.5	3.5	11.5
9	Procure souvenirs for the visitors such as t-shirts, caps etc	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	2.0	13.0
10	Set up website for the National Park	3.0	0.5	0.5	0.5	2.0	0.8	0.8	0.8	1.0	1.0	10.8
	Sub Total	14.0	12.5	7.0	6.0	8.5	11.3	12.8	7.8	10.0	13.5	103.3
IV	Eco-Development											

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
1	Capacity building for staff in participatory techniques	0.5	0.5	1	1	1	1.25	1.25	1.25	1.5	1.5	39.0
2	Capacity building as tourist guides for local youth	-	1	1	1.2	1.2	1.5	1.5	1.75	1.75	1.75	41.0
3	Development of micro plans with stakeholders seeking their ownership to conserve the landscape	0.5	1	1.5	1.5	2	2	2.25	2.25	2.5	2.5	60.0
Sub Total		1	2.5	3.5	3.7	4.2	4.75	2.75	5.25	5.75	5.75	140.0
V	Research, Monitoring and Training											
1	Conduct basic research such as survey of biological diversity, socio-economic conditions of the migrant herders grazing	2.0	2.0	2.0	2.5	2.5	2.5	3.0	3.0	3.0	3.0	25.5

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
	livestock in the buffer zone etc											
2	Train staff in wildlife techniques, Ecotourism, wildlife laws etc with field visits	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	35.0
3	Annual monitoring of biological diversity in the National Park	2.0	2.5	3.0	3.5	4.0	4.0	4.0	4.0	5.0	5.0	37.0
Sub Total		7.0	7.5	8.0	9.0	9.5	10.5	11.0	11.0	12.0	12.0	97.5
VI	Publicity & Awareness											
1	Preparation of brochures, banners, publicity materials etc...	1.0	-	1.0	-	1.0	-	-	2.0	-	2.5	7.5
2	Nature Education Camps for local	1.0	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.0	2.0	15.5

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	Total
	school children											
	Sub Total	2.0	1.0	2.0	1.5	2.5	1.5	2.0	4.0	2.0	4.5	23.0
VII	Establishment Costs											
1	Salaries and allowances for the proposed staff	7.5	8.0	8.5	9.0	10.0	10.5	11.0	11.5	12.0	12.5	100.5
2	TA, Medical expenses, of the staff	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	42.5
3	Office expenses on site	1.0	1.0	1.3	1.3	1.5	1.5	1.8	1.8	2.0	2.0	15.0
	Sub Total	10.5	11.5	12.8	13.8	15.5	16.5	17.8	18.8	20.0	21.0	158.0
VIII	Maintenance of Permanent Assets at Pin Valley National Park											
1	Civil maintenance of structures built for management of Pin Valley National Park	2.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	25.0
2	Maintenance of vehicles	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	12.5

Year-wise break up of Financial Target for Management of Pin Valley National Park (2018-2028)												
Sr. No.	Particulars of Work	Rs. In Lakhs										Total
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	
3	Diesel/Petrol expenses	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	12.5
4	Supply of uniform to the staff	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	12.5
6	Immunization of livestock in the buffer zone	2.0	2.0	2.0	2.0	2.5	2.5	3.0	3.0	3.5	3.5	26.0
Sub Total		7.00	7.00	7.00	7.00	7.50	10.00	10.50	10.50	11.00	11.00	88.50
Grand Total		78.75	60.25	56.85	63.75	75.00	90.65	83.65	84.65	90.75	105.00	789.3

Table 11: Details of budgeted expenses over plan period (2018-28)

13. A pocket guide for the PVNP management plan

Pin Valley National Park (PVNP), in Lahaul & Spiti, Himachal Pradesh, represents a Trans-Himalayan arid cold-desert ecosystem. The landscape is inhabited by agro-pastoralist Tibetan Buddhist community. Migratory herders from neighbouring Kinnaur District visit PVNP with 55,000-60,000 sheep-goat during summer (mid-June to August). The globally endangered snow leopard *Panthera uncia* is the top predator in the landscape. Population estimation of snow leopard using camera-trapping in PVNP under NCF-HPFD partnership showed density to be low (0.53 snow leopard per 100 km²). Asiatic ibex *Capra sibirica* is the only large wild-ungulate in PVNP and is the primary prey of snow leopard. Based on long-term monitoring of ibex population in PVNP, 200-250 ibex are present in the national park. They face strong competition from migratory livestock grazing. Ibex density is comparatively very low in intensely grazed area due to competition between migratory livestock and young individuals of ibex through reduction in palatable forage. Brown bear *Ursus arctos* have been reported in the PVNP only since 2013, its distribution, diet, forage availability and interactions with humans are yet to be understood. Wolf has not been confirmed from PVNP, but there are many areas that can potentially support wolf population. PVNP has rich plant diversity, with numerous endemic and rare medicinal plants.

Based on threat analysis in PVNP in 2016, the park experiences four major conservation issues: migratory livestock grazing, road construction, resource use by migratory herders and immigrant labourers and depredation by free-ranging dogs.

Based on these conservation threats, the primary research goal and objectives are:

Goal: To develop ecological understanding and conservation implication of key threats in the PVNP

Research objectives for migratory livestock grazing

- Understanding ecological impacts of migratory livestock grazing on rangeland vegetation and wild-ungulate population
- Understanding changes in migratory herding practices
- Understanding changes in pasture quality

Research objectives for depredation by free-ranging dog

- Assessing distribution and population of dog

- Understanding effects of dog on native wildlife (competition, depredation and disease transmission)

Research objectives for impacts of road construction

- Environmental impact assessment of area already affected and to be affected by proposed roads
- Assessment of scale of disturbance to rangeland vegetation and wildlife during road maintenance activities

Research objectives for resource use

- Understanding role of migratory herders and immigrant labourers in livelihood and economy of local people
- Understanding impact of natural resource use by migratory herders and immigrant labourers on vegetation and wildlife

Based on above four conservation threats, the primary conservation goal and objectives are:

Goal: To manage and/or mitigate impacts of key conservation threats in partnership with local stakeholders

Conservation objectives for migratory livestock grazing

- Reduce livestock grazing pressure
- Reduce density of migratory livestock
- Engaging migratory herder community to develop 'snow leopard friendly' livestock products to reduce dependence on livestock number

Conservation objectives for depredation by free-ranging dog

- Garbage management
- Dog sterilization

Conservation objectives for impacts of road construction

- Optimize duration of road construction
- Maintain patrolling routes to prevent illegal extraction of natural resources
- Patrolling road network to prevent illegal extraction of natural resources

Conservation objectives for migratory herders and immigrant labourers

- Awareness programme
- Patrolling areas with labour camp-sites

Annual monitoring and evaluation of the management plan (research and conservation goals and objectives, implementation of research and conservation intervention projects, their achievements and challenges) is crucial for effective conservation management of the Pin Valley National Park. The management plan may be evaluated independently by a qualified entity at every five years interval.

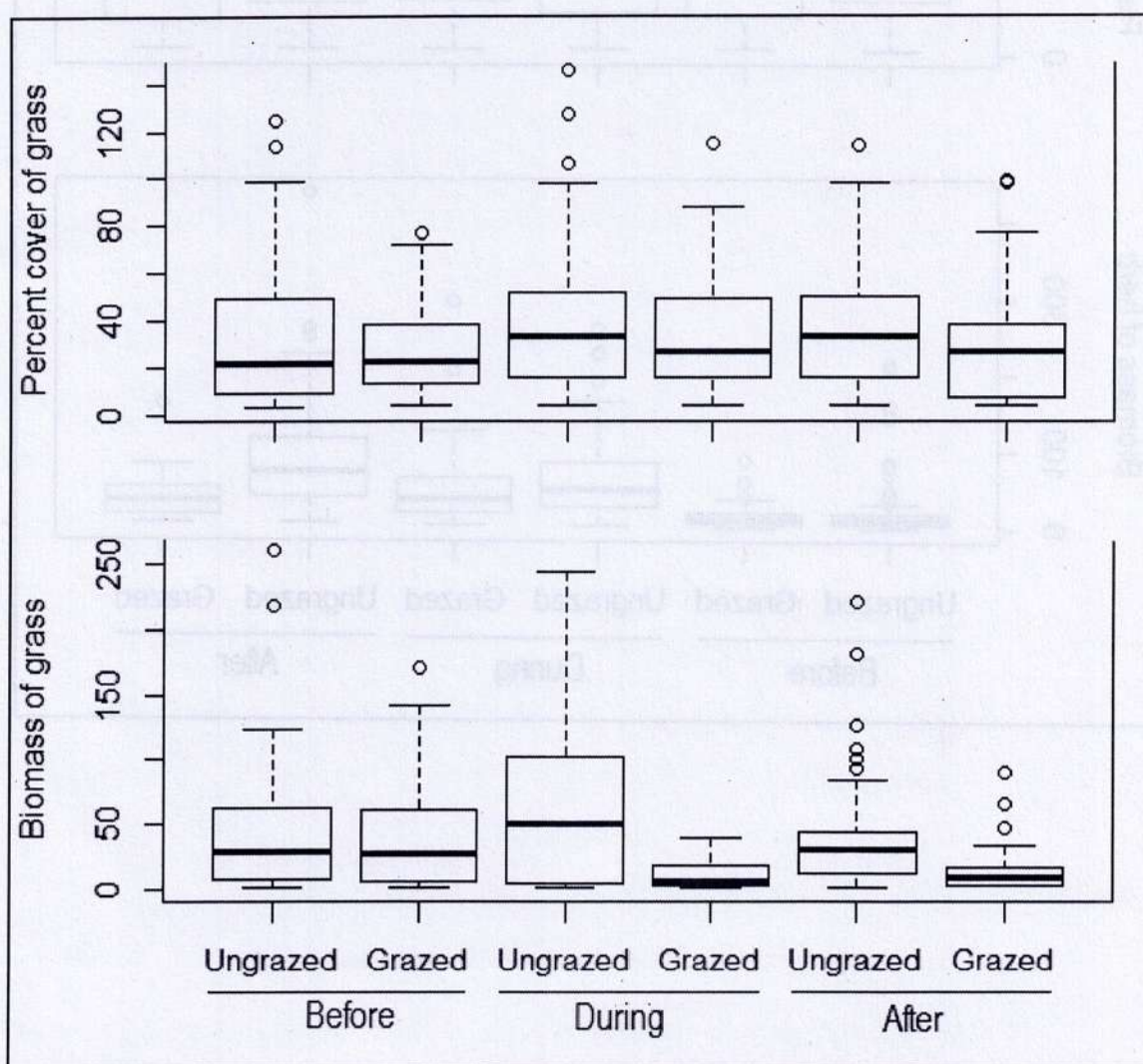
Part 3

Appendices and references

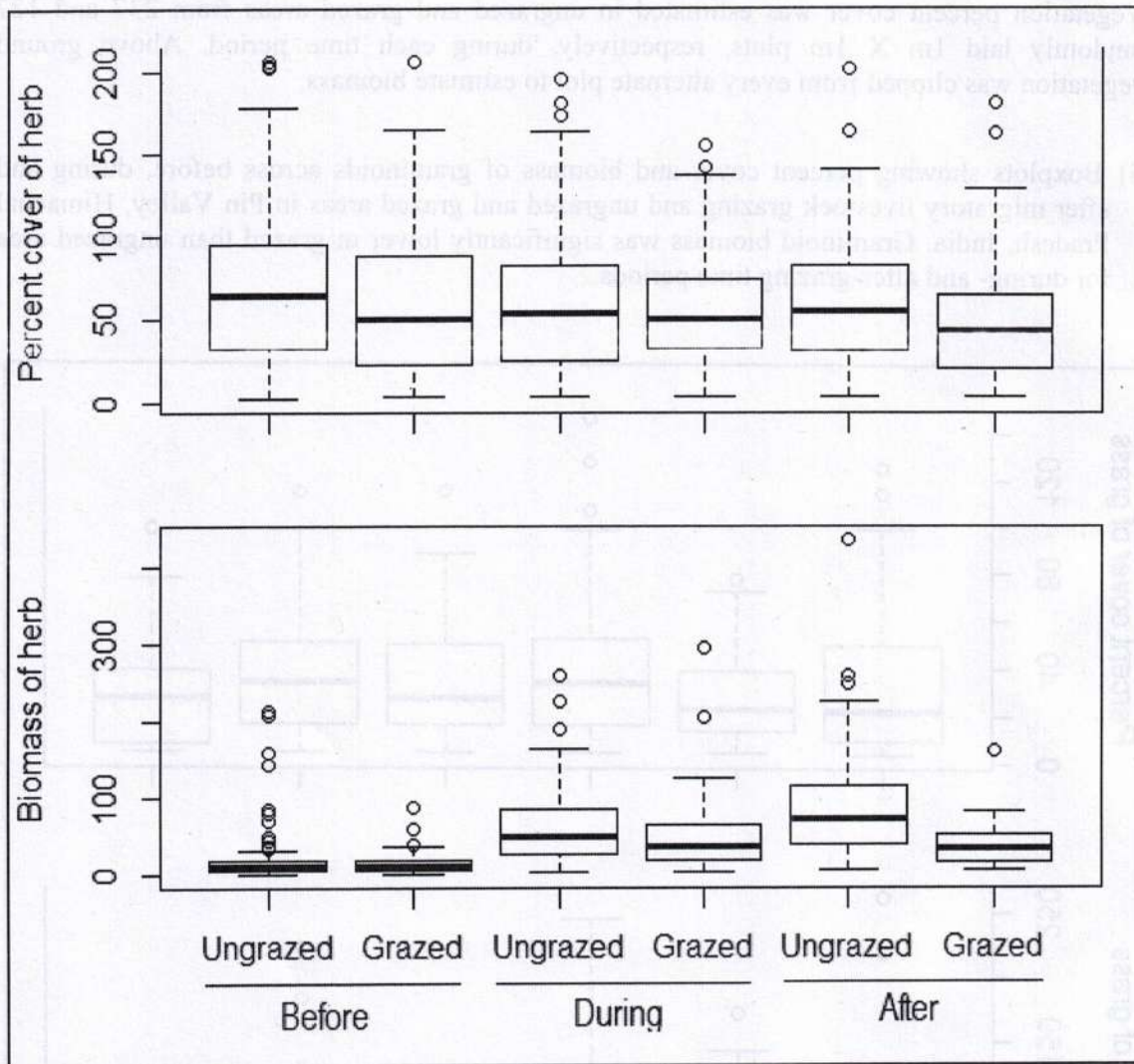
Appendix 1: Effect of migratory livestock grazing on rangeland vegetation in Pin Valley National Park.

Vegetation percent cover was estimated in ungrazed and grazed areas from 237 and 127 randomly laid 1m X 1m plots, respectively, during each time period. Above ground vegetation was clipped from every alternate plot to estimate biomass.

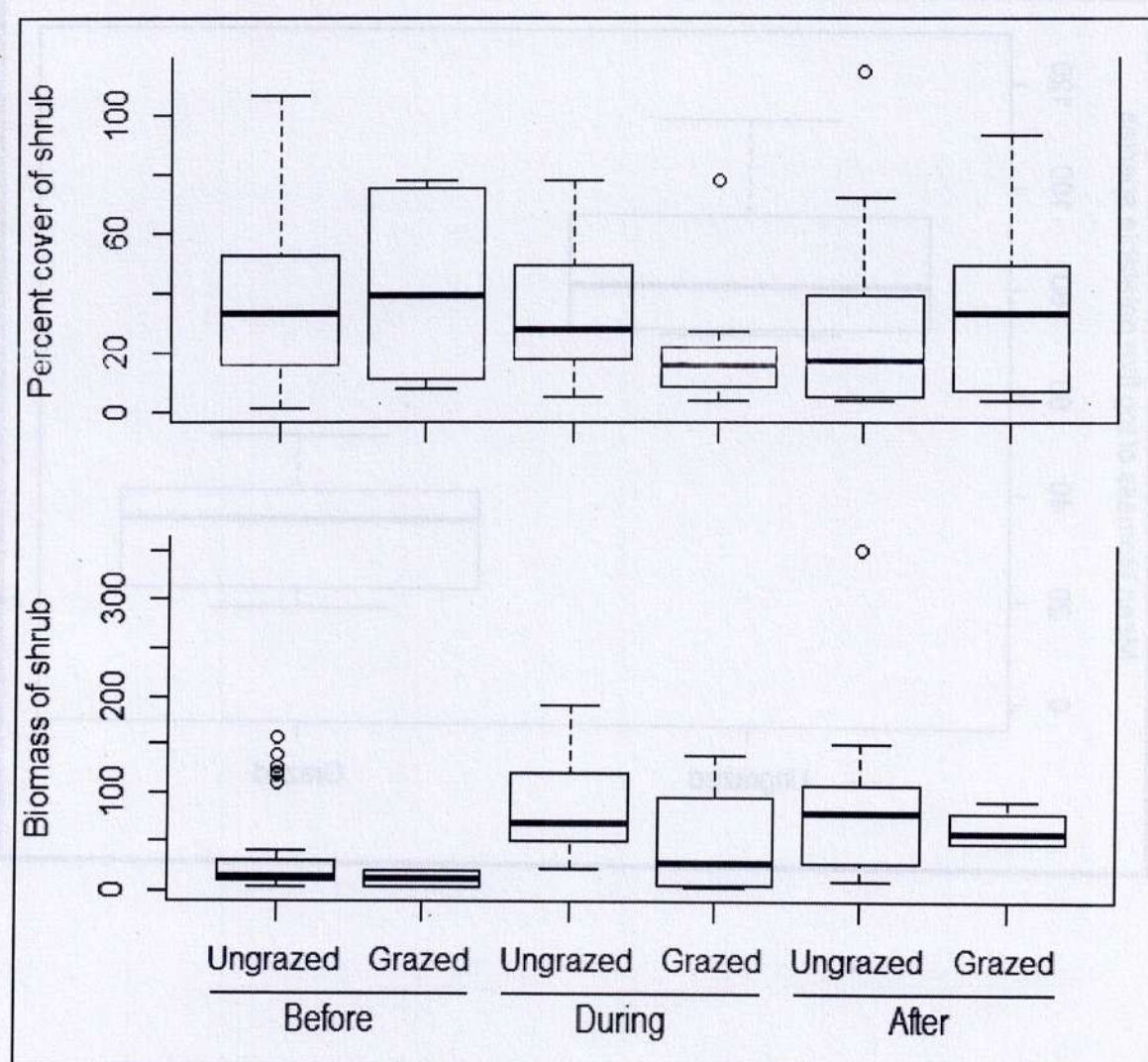
- (i) Boxplots showing percent cover and biomass of graminoids across before, during and after migratory livestock grazing and ungrazed and grazed areas in Pin Valley, Himachal Pradesh, India. Graminoid biomass was significantly lower in grazed than ungrazed area for during- and after-grazing time periods.



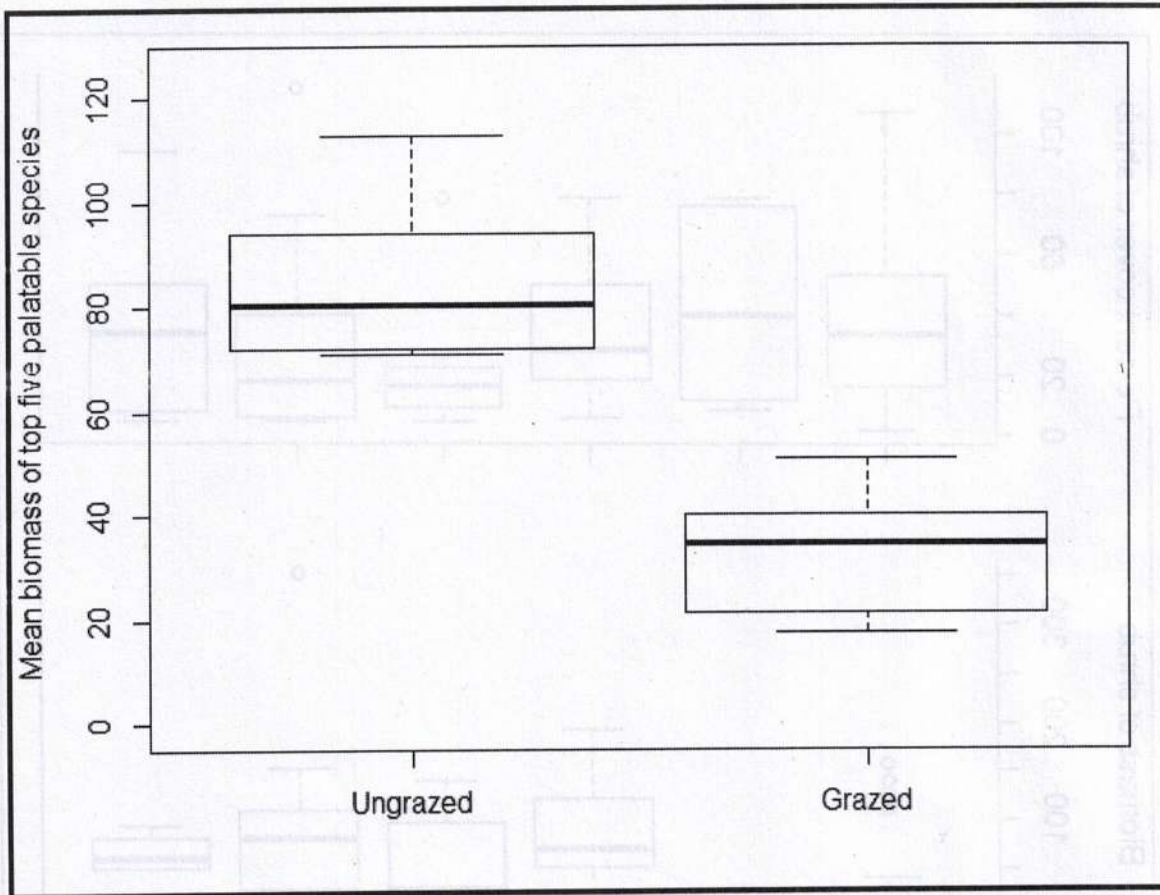
- (ii) Boxplots showing percent cover and biomass of herb across before, during and after migratory livestock grazing and ungrazed and grazed areas in Pin Valley, Himachal Pradesh, India. Herb biomass was significantly lower in grazed than ungrazed area during summer and autumn seasons.



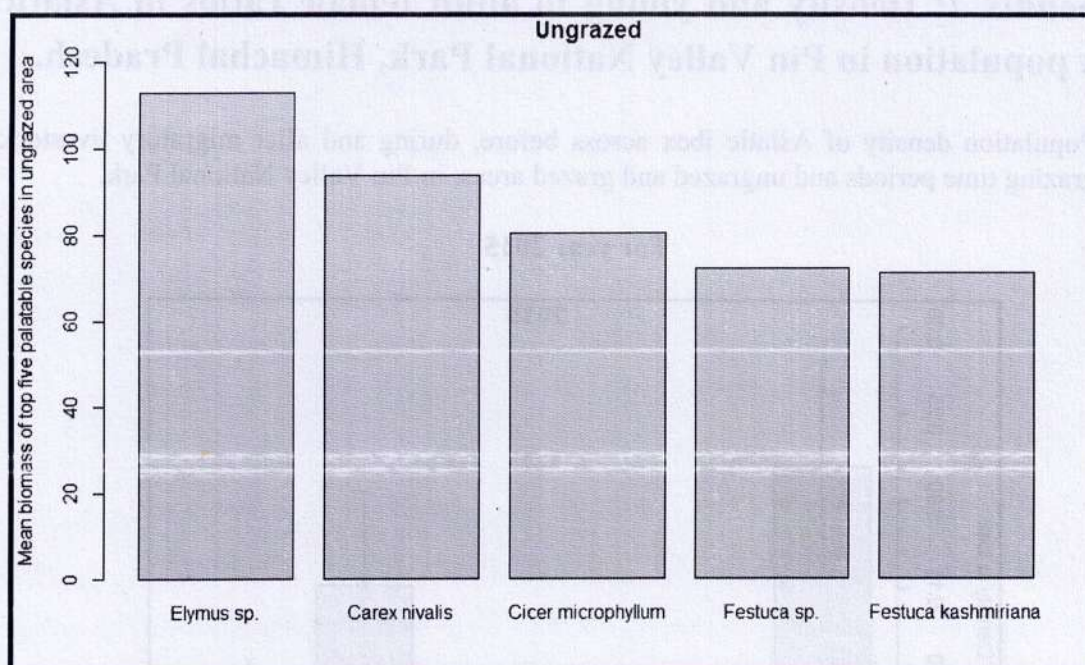
- (iii) Boxplots showing percent cover and biomass of shrub across before, during and after migratory livestock grazing and ungrazed and grazed areas in Pin Valley, Himachal Pradesh, India. Shrub biomass was significantly lower in grazed than ungrazed area during summer season.



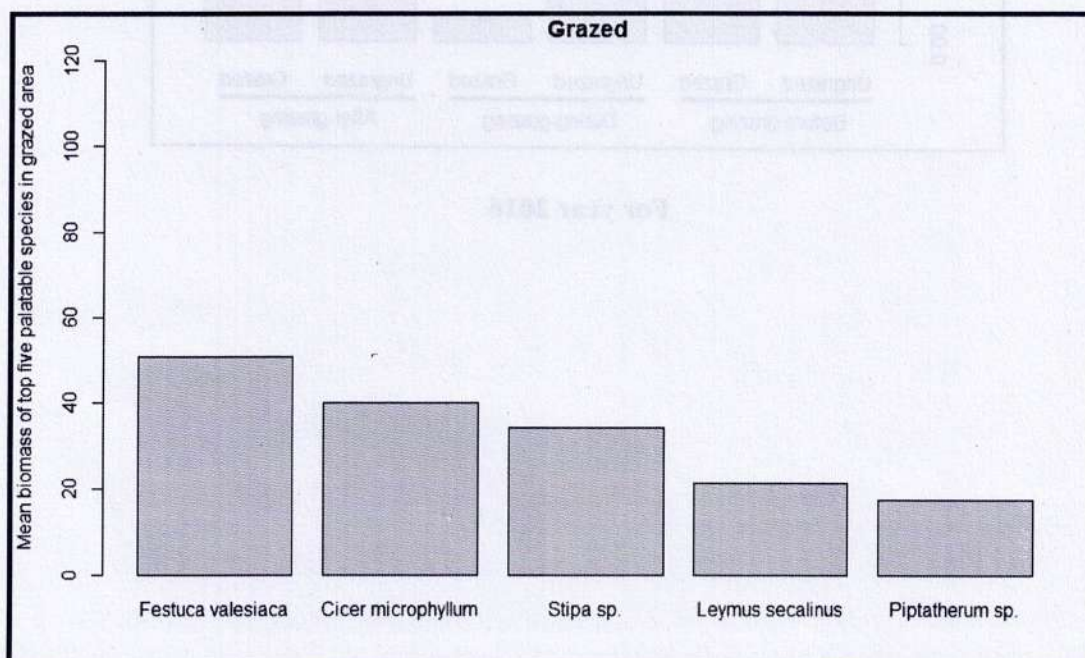
- (iv) Overall mean biomass (gram per square meter) of top five palatable species in ungrazed area was 2.25 times higher than grazed area for after-grazing (autumn season) time period.



- (v) Individual mean biomass (grams per square meter) of top five palatable species in area not grazed by migratory livestock for after-grazing (autumn season) time period.



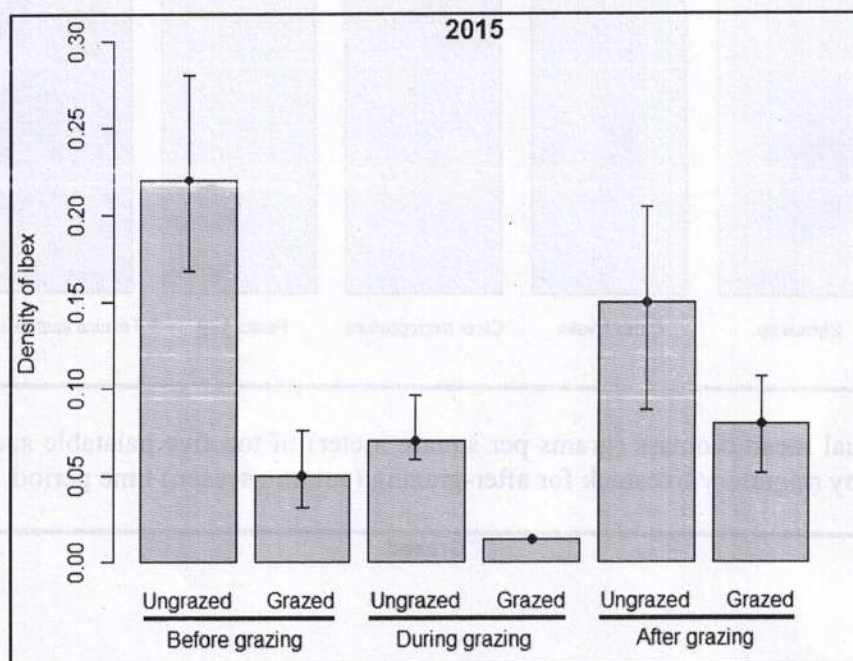
- (vi) Individual mean biomass (grams per square meter) of top five palatable species in area grazed by migratory livestock for after-grazing (autumn season) time period.



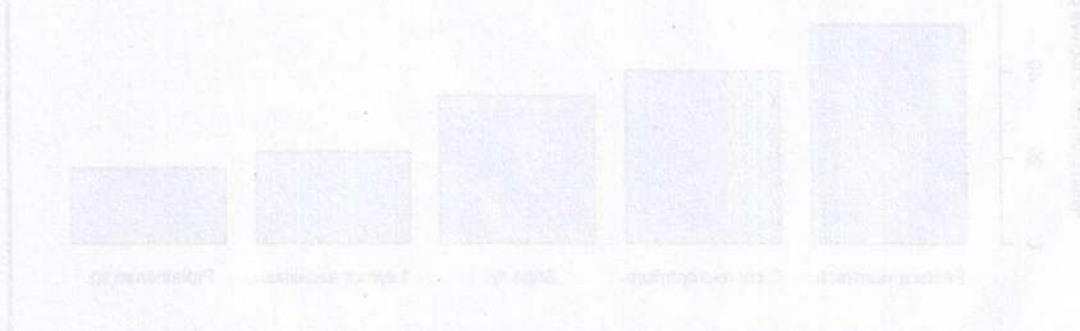
Appendix 2: Density and young to adult female ratios in Asiatic ibex population in Pin Valley National Park, Himachal Pradesh.

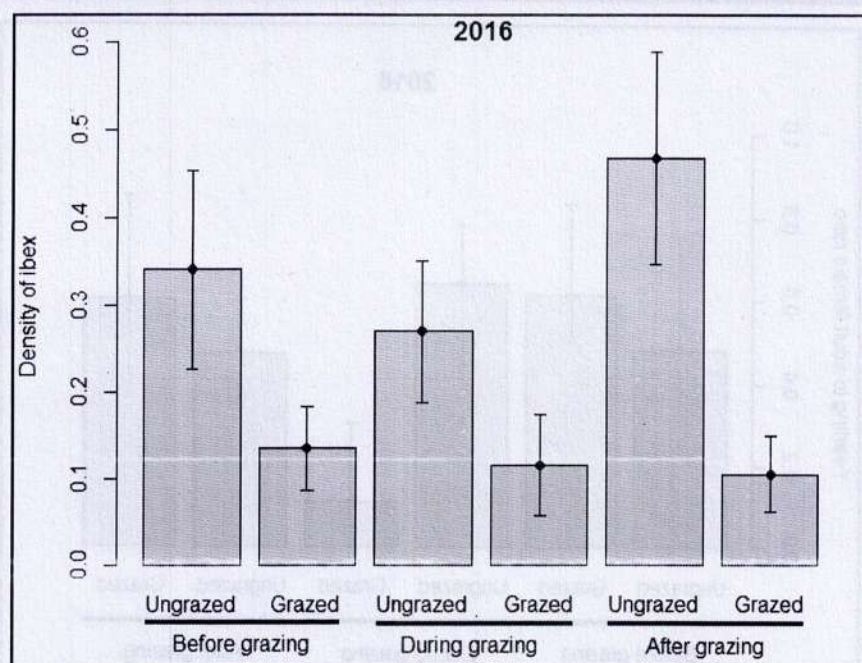
- (i) Population density of Asiatic ibex across before, during and after migratory livestock grazing time periods and ungrazed and grazed areas, in Pin Valley National Park.

For year 2015

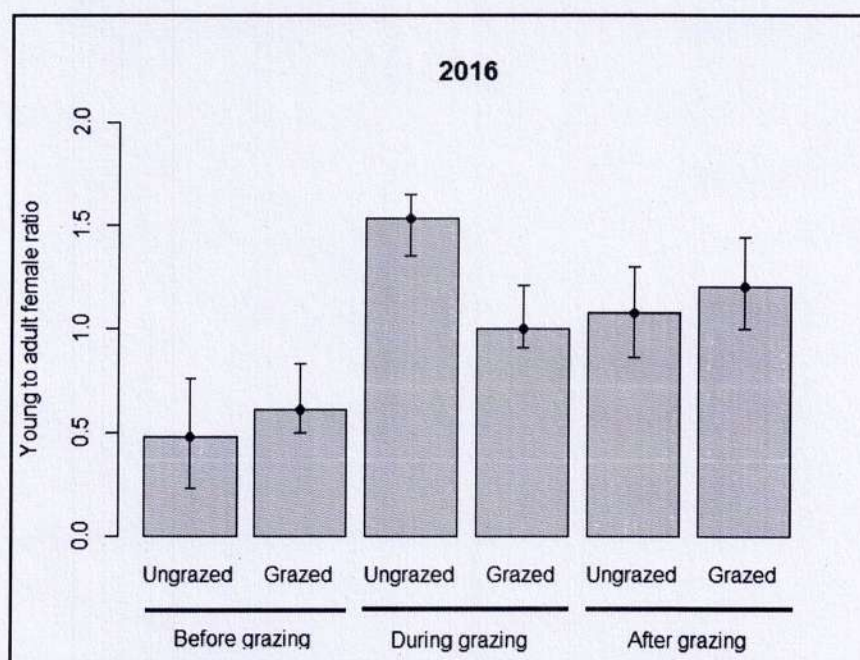


For year 2016

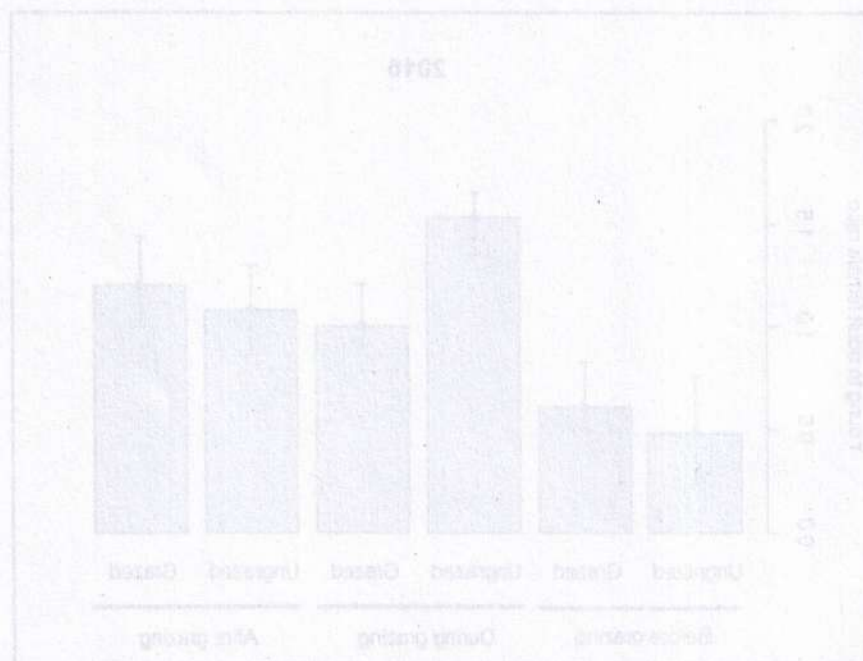
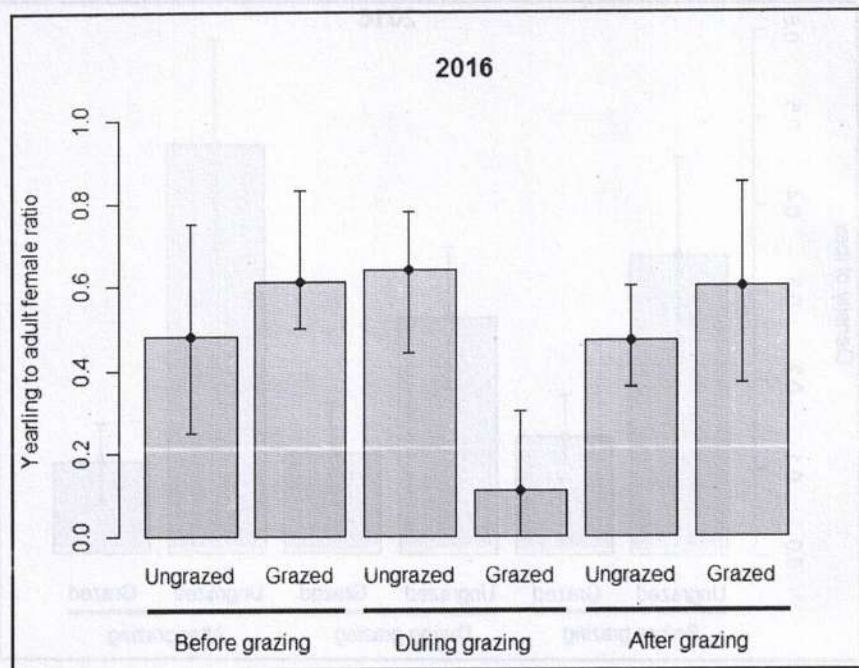




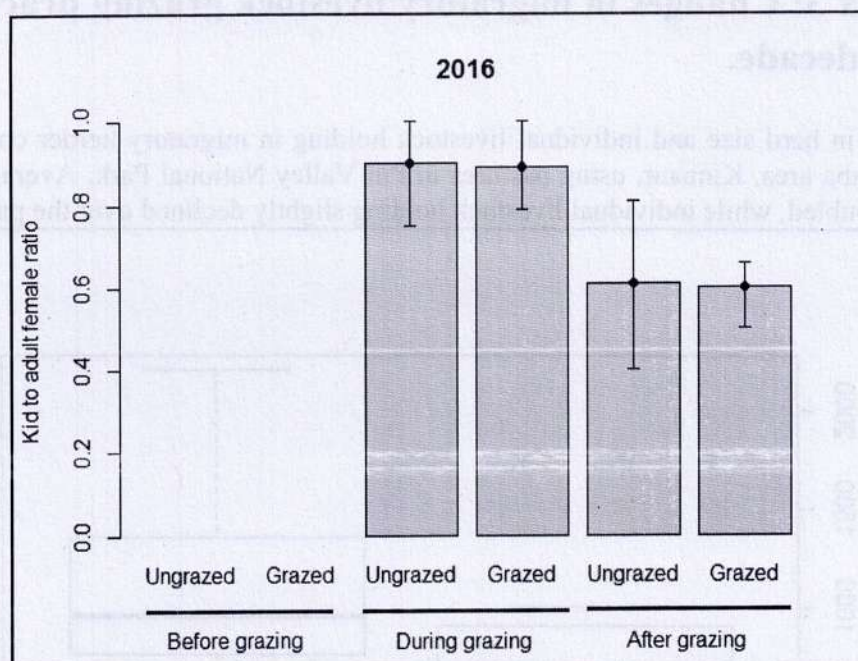
- (ii) Young to adult female ratios in Asiatic ibex populations in ungrazed and grazed areas across before-, during- and after-grazing time periods in Pin Valley National Park.



- (iii) Yearling to adult female ratios in Asiatic ibex populations in ungrazed and grazed areas across before-, during- and after-grazing time periods in Pin Valley National Park.



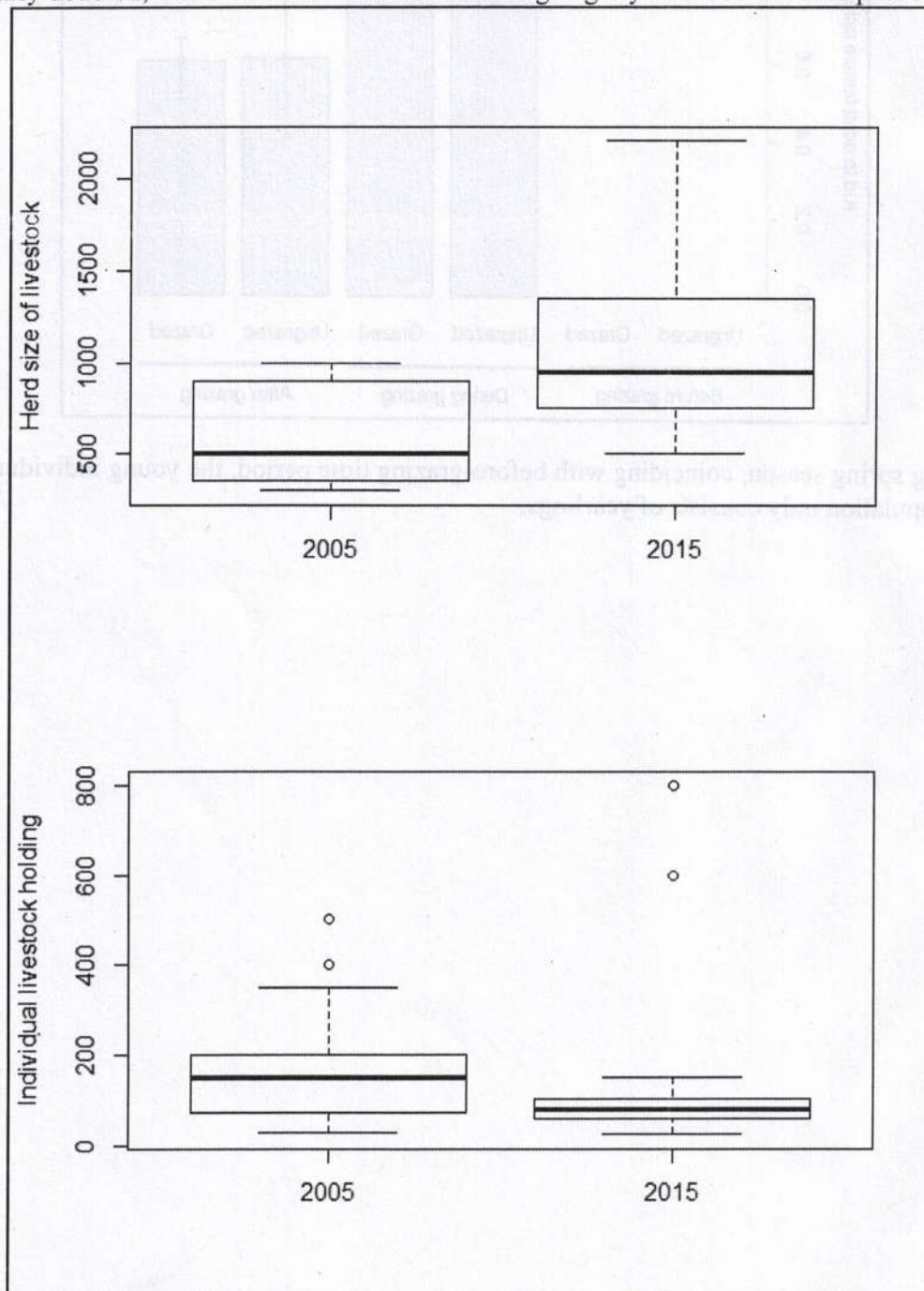
- (iv) Kid to adult female ratios* in Asiatic ibex populations in ungrazed and grazed areas across before-, during- and after-grazing time periods in Pin Valley National Park.



*During spring season, coinciding with before-grazing time period, the young individuals of ibex population only consists of yearlings.

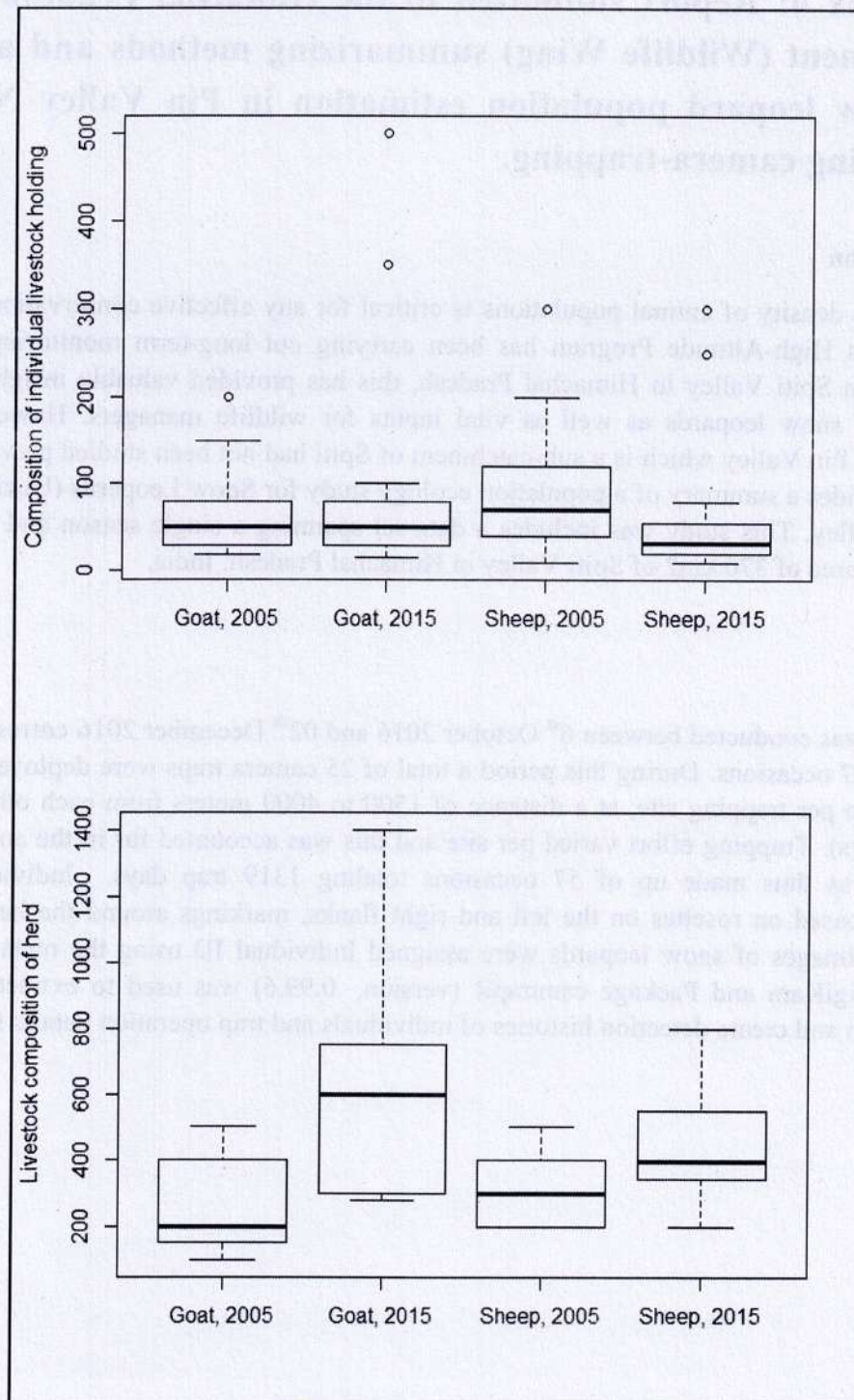
Appendix 3: Changes in migratory livestock grazing practice over the past decade.

- (i) Changes in herd size and individual livestock holding in migratory herder community of Ruppi-Bhaba area, Kinnaur, using pastures in Pin Valley National Park. Average herd size nearly doubled, while individual livestock holding slightly declined over the past decade.



- (ii) Changes in individual livestock (sheep-goat) holding composition and herd composition of migratory herder community over the past decade. Individual goat holding remained

similar, while individual sheep holding declined; goat in herd increased by 2.4 times, while sheep in herd increased by 1.42 times over the past decade.



Appendix 4: Report submitted to the Himachal Pradesh Forest Department (Wildlife Wing) summarizing methods and analyses for snow leopard population estimation in Pin Valley National Park using camera-trapping.

Introduction

Monitoring density of animal populations is critical for any effective conservation program. NCF-SLT's High-Altitude Program has been carrying out long-term monitoring of Snow Leopards in Spiti Valley in Himachal Pradesh, this has provided valuable insights into the ecology of snow leopards as well as vital inputs for wildlife managers. However, Snow leopards in Pin Valley which is a sub-catchment of Spiti had not been studied previously, this report provides a summary of a population ecology study for Snow Leopards (*Uncia uncia*) in the Pin Valley. This study includes a data-set spanning a single season and covering a core study area of 370 km² of Spiti Valley in Himachal Pradesh, India.

Methods

Sampling was conducted between 6th October 2016 and 02th December 2016 corresponding to a total of 57 occasions. During this period a total of 25 camera traps were deployed with one camera trap per trapping site, at a distance of 1500 to 4000 meters from each other (mean = 2438 meters). Trapping effort varied per site and this was accounted for in the analysis. The data set was thus made up of 57 occasions totaling 1319 trap days. Individuals were identified based on rosettes on the left and right flanks, markings around the head and tail markings. Images of snow leopards were assigned Individual ID using the meta-tagging in software digiKam and Package camtrapR (version, .0.99.6) was used to extract meta-data information and create detection histories of individuals and trap operation details for analysis in SECR.

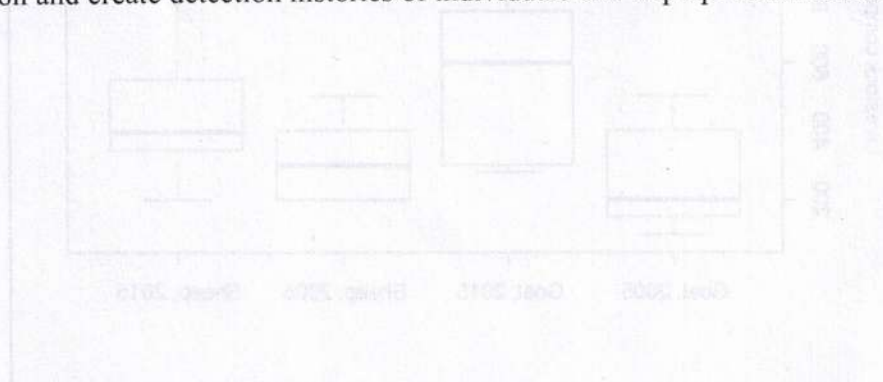


Fig 1. Map of study area showing camera-trap locations.

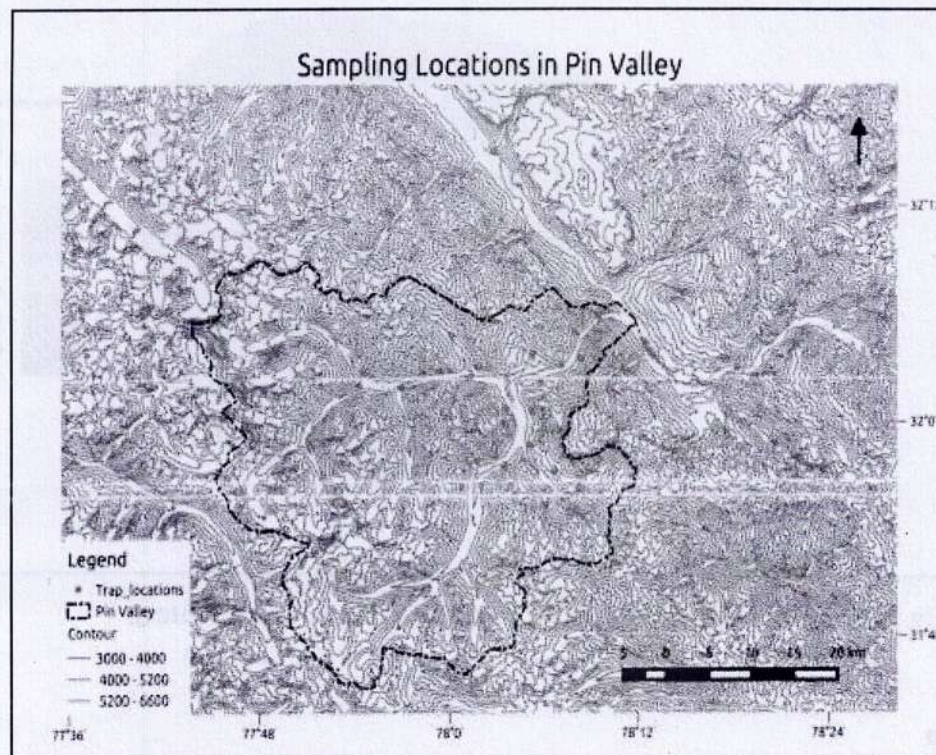


Table 1. Comparison of density estimates from Spiti Left Bank and Pin Valley. 95% CI indicated in brackets.

Study Site	Spiti Left Bank			Pin Valley
Season	2011-12	2013-14	2015	2016
SECR Result without habitat mask	1.08(.65 - 1.85) /100km ²	0.92(.57 - 1.49) /100km ²	0.80(.46-1.38) /100 km ²	0.43(.12-1.57)/100km ²

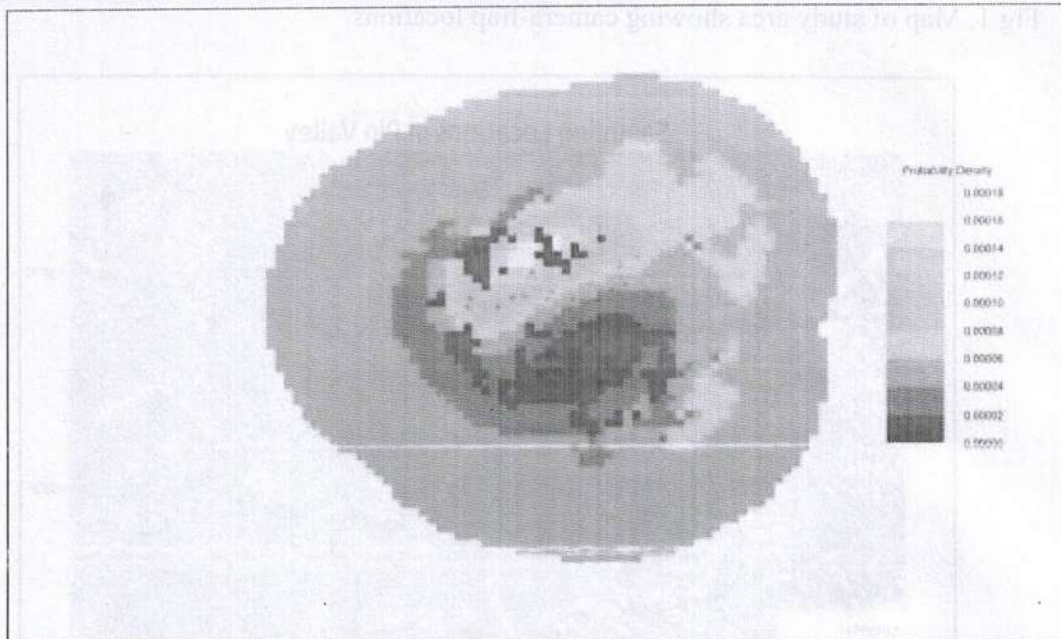


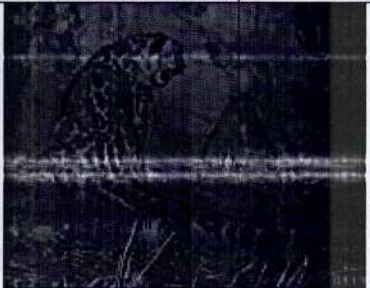
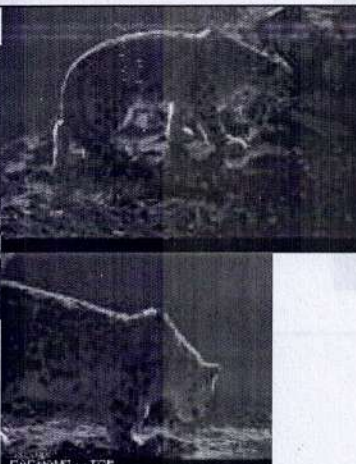
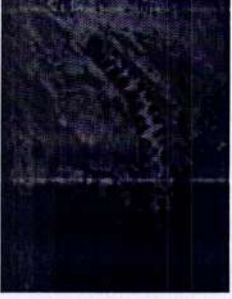
Fig 3: Probability density surface of estimated home-range centers.

Conclusion

Snow Leopards are wide-ranging species with individual home range sizes usually exceeding 100 km^2 , this is reflected in the low population densities of snow leopards. This study reports considerably lower densities of snow leopard in Pin Valley as compared to those reported from Spiti Left bank using similar methodology. Population densities of snow leopards can vary within a contiguous landscape and further research is required to determine the underlying factors.

Study Area	2011-12	2012-13	2013-14	2014-15
Spiti Left Bank	1.08 (1.33)	0.93 (1.33)	0.93 (1.33)	0.93 (1.33)
Pin Valley	0.43 (1.12)	0.43 (1.12)	0.43 (1.12)	0.43 (1.12)

Snow Leopard Profiles

Individual	Left Flank	Right Flank	Back/Tail	Head
Pin1				
Pin2				
Pin4				

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असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)

PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित

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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 11 मार्च, 2016

का.आ. 1053(अ).—निम्नलिखित प्रारूप अधिसूचना, जिसे केन्द्रीय सरकार, पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उपधारा (2) के खंड (v) और खंड (xiv) तथा उपधारा (3) के साथ पठित उपधारा (1) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, जारी करने का प्रस्ताव करती है, पर्यावरण (संरक्षण) नियम, 1986 के नियम 5 के उपनियम (3) की अपेक्षानुसार, जनसाधारण की जानकारी के लिए प्रकाशित की जाती है; जिनके उससे प्रभावित होने की संभावना है; और यह सूचना दी जाती है कि उक्त प्रारूप अधिसूचना पर, उस तारीख से, जिसको इस अधिसूचना वाले भारत के राजपत्र की प्रतियां जनसाधारण को उपलब्ध करा दी जाती हैं, साठ दिन की अवधि की समाप्ति पर या उसके पश्चात् विचार किया जाएगा;

ऐसा कोई व्यक्ति, जो प्रारूप अधिसूचना में अंतर्विष्ट प्रस्तावों के संबंध में कोई आक्षेप या सुझाव देने में हितबद्ध है, इस प्रकार विनिर्दिष्ट अवधि के भीतर, केन्द्रीय सरकार द्वारा विचार किए जाने के लिए, आक्षेप या सुझाव सचिव, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, इंदिरा पर्यावरण भवन, जोर बाग रोड, अलीगंज, नई दिल्ली-110003 या ई-मेल पते: esz-mef@nic.in पर लिखित रूप में भेज सकेगा।

प्रारूप अधिसूचना

पीन घाटी राष्ट्रीय उद्यान, हिमाचल प्रदेश के लाहोल-स्पीति जिले में उत्तर 31°6'40 से 32°02'20 अक्षांश और पूर्व 77°4'21 से 78°06'19 देशांतर में 675 वर्ग किलोमीटर के क्षेत्र में फैला हुआ है। समग्र क्षेत्र में बहुत समृद्ध जैव विविधता है और ऐतिहासिक, आर्थिक और औषधीय महत्व है।

और, इस राष्ट्रीय उद्यान में मुख्य प्रजातियां साह, जंगली बकरी गरूड, लोमड़ी, भरल और भूरा भालू पाए जाते हैं।

और, पिन घाटी राष्ट्रीय उद्यान, के चारों ओर के क्षेत्र को, जिसका विस्तार और सीमाएं इस अधिसूचना के पैरा 1 में विनिर्दिष्ट हैं, पर्यावरण की दृष्टि से पारिस्थितिक संवेदी जोन के रूप में सुरक्षित और संरक्षित करना तथा उक्त पारिस्थितिक संवेदी जोन में उद्योगों या उद्योगों के वर्गों के प्रचालन तथा प्रसंस्करण करने को प्रतिषिद्ध करना आवश्यक है;

अतः, इसलिए, केन्द्रीय सरकार, पर्यावरण (संरक्षण) नियम, 1986 के नियम 5 के उपनियम (3) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उपधारा (3) और उपधारा (2) के खंड (v) और खंड (xiv) और उपधारा (1) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, हिमाचल प्रदेश में पिन घाटी राष्ट्रीय उद्यान, की सीमा से 0 से 45.82 किलोमीटर तक के विस्तार तक के क्षेत्र को पिन घाटी राष्ट्रीय उद्यान पारिस्थितिकी संवेदी जोन (जिसे इसमें इसके पश्चात् पारिस्थितिक संवेदी जोन कहा गया है) के रूप में अधिसूचित करती है, जिसका विवरण निम्नानुसार है, अर्थात् :-

1. पारिस्थितिक संवेदी जोन का विस्तार और उसकी सीमाएं--(1) पारिस्थितिक संवेदी जोन पिन घाटी राष्ट्रीय उद्यान के चारों ओर 45.82 किलोमीटर के विस्तार तक 1150 वर्ग किलोमीटर क्षेत्र में होगा। पारिस्थितिक संवेदी जोन का प्रस्ताव पिन घाटी राष्ट्रीय उद्यान की उत्तर - पश्चिम, उत्तर - पूर्व और दक्षिण - पूर्व तरफ किया गया है जैसा कि मानचित्र में उपदर्शित है जबकि राष्ट्रीय उद्यान का दक्षिण- पश्चिम भाग खीरगंगा वन्यजीव अभयारण्य, ग्रेट हिमालयन राष्ट्रीय उद्यान, रूपी - भावा वन्यजीव अभयारण्य और लिप्पा असरंग वन्यजीव अभयारण्य के साथ सतत रूप से है। इसलिए पिन घाटी राष्ट्रीय उद्यान के इस भाग में किसी पारिस्थितिक संवेदी जोन का प्रस्ताव नहीं किया गया है।

2. उक्त पारिस्थितिक संवेदी जोन के अंतर्गत आने वाले तेरह ग्रामों की सूची उनके जी.पी.एस समन्वयकों सहित उपाबंध I के रूप में उपाबद्ध है।

3. पारिस्थितिक संवेदी जोन का मानचित्र और उसके सीमा के ब्यौरा तथा अक्षांश और देशान्तर सहित उपाबंध II के रूप में उपाबद्ध है।

2. पारिस्थितिक संवेदी जोन के लिए आंचलिक महायोजना.—(1) राज्य सरकार, पारिस्थितिक संवेदी जोन के प्रयोजनों के लिए राजपत्र में इस अधिसूचना के अंतिम प्रकाशन की तारीख से दो वर्ष की अवधि के भीतर, स्थानीय व्यक्तियों के परामर्श से, और इस अधिसूचना में दिए गए अनुबंधों का पालन करते हुए आंचलिक महायोजना तैयार करेगी।

(2) आंचलिक महायोजना का अनुमोदन राज्य सरकार में सक्षम प्राधिकारी द्वारा किया जाएगा।

(3) पारिस्थितिक संवेदी जोन के लिए आंचलिक महायोजना राज्य सरकार द्वारा ऐसी रीति जैसा इस अधिसूचना में विनिर्दिष्ट है और सुसंगत केन्द्रीय और राज्य विधियों तथा केन्द्रीय सरकार द्वारा जारी मार्गदर्शक सिद्धांतों, यदि कोई हो, के अनुरूप भी तैयार की जाएगी।

(4) आंचलिक महायोजना सभी संबद्ध राज्य विभागों के साथ परामर्श से पर्यावरणीय और पारिस्थितिक विचारणों को उसमें एकीकृत करने के लिए तैयार की जाएगी, अर्थात्:--

(i) पर्यावरण ;

(ii) वन ;

- (iii) नगर विकास ;
- (iv) पर्यटन ;
- (v) नगरपालिक ;
- (vi) राजस्व ;
- (vii) कृषि ;
- (viii) हिमाचल प्रदेश राज्य प्रदूषण नियंत्रण बोर्ड ;
- (ix) सिंचाई ;
- (x) लोक निर्माण विभाग।

(5) आंचलिक महायोजना अनुमोदित विद्यमान भू-उपयोग, अवसंरचनात्मक और क्रियाकलापों पर कोई निर्विधन अधिरोपित नहीं करेगी जब तक कि इस अधिसूचना में इस प्रकार विनिर्दिष्ट न हो और आंचलिक महायोजना सभी अवसंरचना और क्रियाकलापों में दक्षता और पारिस्थितिक अनुकूलता का संवर्द्धन करेगी।

(6) आंचलिक महायोजना में अनाच्छादित क्षेत्रों के जीर्णोद्धार, विद्यमान जल निकायों के संरक्षण, आवाह क्षेत्रों के प्रबंधन, जल-संभरों के प्रबंधन, भूतल जल के प्रबंधन, मृदा और नमी संरक्षण, स्थानीय समुदायों की आवश्यकताओं तथा पारिस्थितिक और पर्यावरण से संबंधित ऐसे अन्य पहलुओं, जिन पर ध्यान देना आवश्यक है, के लिए उपबंध होंगे।

(7) आंचलिक महायोजना सभी विद्यमान पूजा स्थलों, ग्रामों और नगरीय बस्तियों, वनों के प्रकार और किस्मों, कृषि क्षेत्रों, ऊपजाऊ भूमि, हरित क्षेत्र जैसे उद्यान और उसी प्रकार के स्थान, उद्यान कृषि क्षेत्र, आर्किडों, झीलों और अन्य जल निकायों का अभ्यंकन करेगी।

(8) आंचलिक महायोजना पारिस्थितिक संवेदी जोन में विकास को विनियमित करेगी जिससे कि स्थानीय समुदायों के पारिस्थितिक जन्य विकास और जीविका को सुनिश्चित किया जा सके।

3. राज्य सरकार द्वारा किए जाने वाले उपाय- राज्य सरकार इस अधिसूचना के उपबंधों को प्रभावी करने के लिए निम्नलिखित उपाय करेगी, अर्थात् :-

(1) **भू-उपयोग** - पारिस्थितिक संवेदी जोन में वनों, उद्यान-कृषि क्षेत्रों, कृषि क्षेत्रों, आमोद-प्रमोद के प्रयोजन के लिए चिन्हित किए गए पार्कों और खुले स्थानों का वाणिज्यिक और औद्योगिक संबद्ध विकास क्रियाकलापों के लिए उपयोग या संपरिवर्तन नहीं होगा :

परंतु पारिस्थितिक संवेदी जोन के भीतर कृषि भूमि का संपरिवर्तन के अधीन मानीटरी समिति की सिफारिश पर और राज्य सरकार के पूर्व अनुमोदन से, स्थानीय निवासियों की आवासीय जरूरतों को पूरा करने के लिए और पैरा 4 की सारणी के स्तंभ (2) के अधीन मद सं. 12, 21, 27, 36 और 37 के सामने सूचीबद्ध क्रियाकलापों को पूरा करने के लिए अनुज्ञात होंगे, अर्थात् :-

- (i) पारिस्थितिक अनुकूल पर्यटन क्रियाकलापों के लिए पर्यटकों के अस्थायी आवासन के लिए पारिस्थितिक अनुकूल आरामगाह जैसे टेंट, लकड़ी के मकान आदि ;
- (ii) विद्यमान सड़कों को चौड़ा और सुदृढ़ करना ;
- (iii) प्रदूषण उत्पन्न न करने वाले लघु उद्योग ;

(iv) कुटीर उद्योग, जिसके अंतर्गत ग्रामीण उद्योग, सुविधा भंडार और स्थानीय सुविधाएं सम्मिलित हैं ;

(v) वर्षा जल संचय।

परंतु यह और कि जनजातीय भूमि का उपयोग राज्य सरकार के पूर्व अनुमोदन और संविधान के अनुच्छेद 244 या तत्समय प्रवृत्त विधि के उपबंधों के अनुपालन के बिना, जिसके अंतर्गत अनुसूचित जनजाति और अन्य परंपरागत वन निवासी (वन अधिकारों की मान्यता) अधिनियम, 2006 (2007 का 2) भी है, वाणिज्यिक या उद्योग विकास क्रियाकलापों के लिए अनुज्ञात नहीं होगा :

परंतु यह और भी कि पारिस्थितिक संवेदी जोन के भीतर भू-अभिलेखों में उपसंज्ञात कोई त्रुटि, मानीटरी समिति के विचार प्राप्त करने के पश्चात् राज्य सरकार द्वारा प्रत्येक मामले में एक बार संशोधित होगी और उक्त त्रुटि के संशोधन की सूचना केंद्रीय सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को देनी होगी।

परंतु यह और भी कि उपर्युक्त त्रुटि का संशोधन में इस उप-पैरा के अधीन यथाउपबंधित के सिवाय किसी भी दशा में भू-उपयोग का परिवर्तन सम्मिलित नहीं होगा।

परंतु यह और भी कि हरित क्षेत्र जैसे वन क्षेत्र, कृषि क्षेत्र आदि में कोई पारिणामिक कटौती नहीं होगी और अप्रयुक्त या अनुत्पादक कृषि क्षेत्रों में पुनः वनीकरण करने के प्रयास किए जाएंगे।

(2) **प्राकृतिक जल स्रोतों** -- आंचलिक महायोजना में सभी प्राकृतिक जल स्रोतों की पहचान की जाएगी और उनके संरक्षण और पुनरुद्भूतकरण के लिए योजना सम्मिलित होगी और राज्य सरकार द्वारा ऐसे क्षेत्रों पर या उनके निकट विकास क्रियाकलाप प्रतिषिद्ध करने के लिए ऐसी रीति से मार्गनिर्देश तैयार किए जाएंगे।

(3) **पर्यटन** -- (क) पारिस्थितिक संवेदी जोन के भीतर पर्यटन संबंधी क्रियाकलाप पर्यटन महायोजना के अनुसार होंगे जो कि आंचलिक महायोजना के भाग रूप में होगी।

(ख) पर्यटन महायोजना पर्यटन विभाग द्वारा राज्य सरकार के वन और पर्यावरण विभाग के परामर्श से तैयार की जाएगी

(ग) पर्यटन संबंधी क्रियाकलाप निम्नलिखित के अधीन विनियमित होंगे, अर्थात् :-

(i) पारिस्थितिक संवेदी जोन के भीतर सभी नए पर्यटन क्रियाकलापों या विद्यमान पर्यटन क्रियाकलापों का विस्तार केंद्रीय सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय के मार्गदर्शक सिद्धांतों के द्वारा तथा राष्ट्रीय व्याघ्र संरक्षण प्राधिकरण, द्वारा जारी पारिस्थितिक पर्यटन (समय-समय पर यथा संशोधित) मार्गदर्शक सिद्धांतों के अनुसार, पारिस्थितिक पर्यटन, पारिस्थितिक शिक्षा और पारिस्थितिक विकास को महत्व देते हुए पारिस्थितिक संवेदी जोन की वहन क्षमता के अध्ययन पर आधारित होगा;

(ii) पारिस्थितिक अनुकूल पर्यटक क्रियाकलापों के संबंध में अस्थायी अधिभोग के लिए वास सुविधा के सिवाय पिन घाटी राष्ट्रीय उद्यान की सीमा से एक किलोमीटर भीतर होटल और रिसोर्टों का नया संनिर्माण अनुज्ञात नहीं होगा ;

(iii) आंचलिक महायोजना का अनुमोदन किए जाने तक, पर्यटन के लिए विकास और विद्यमान पर्यटन क्रियाकलापों के विस्तार को वास्तविक स्थल विनिर्दिष्ट संवीक्षा तथा मानीटरी समिति की सिफारिश पर आधारित संबंधित विनियामक प्राधिकरणों द्वारा अनुज्ञात किया होगा।

(4) **नैसर्गिक विरासत** -- पारिस्थितिक संवेदी जोन में महत्वपूर्ण नैसर्गिक विरासत के सभी स्थलों जैसे सभी जीन कोश आरक्षित क्षेत्र, शैल विरचनाएं, जल प्रपातों, झरनों, घाटी मार्गों, उपवनों, गुफाओं, स्थलों, भ्रमण, अश्वरोहण, प्रपातों आदि की पहचान की जाएगी और उन्हें परिरक्षित किया जाएगा तथा उनकी सुरक्षा और संरक्षा के लिए इस अधिसूचना के प्रकाशन की तारीख से छह मास के भीतर, उपयुक्त योजना बनाई जाएगी और ऐसी योजना आंचलिक महायोजना का भाग होगी।

(5) **मानव निर्मित विरासत स्थल** - पारिस्थितिक संवेदी जोन में भवनों, संरचनाओं, शिल्प-तथ्य, ऐतिहासिक, कलात्मक और सांस्कृतिक महत्व के क्षेत्रों की पहचान करनी होगी और इस अधिसूचना के अंतिम प्रकाशन की तारीख से छह माह के भीतर उनके संरक्षण की योजनाएं तैयार करनी होंगी तथा आंचलिक महायोजना में सम्मिलित की जाएंगी।

(6) **ध्वनि प्रदूषण** -- पारिस्थितिक संवेदी जोन में ध्वनि प्रदूषण के नियंत्रण के लिए राज्य सरकार का पर्यावरण विभाग, वायु (प्रदूषण निवारण और नियंत्रण) अधिनियम, 1981 (1981 का 14) और उसके अधीन बनाए गए नियमों के उपबंधों के अनुसरण में मार्गदर्शक सिद्धांत और विनियम तैयार करेगा।

(7) **वायु प्रदूषण** -- पारिस्थितिक संवेदी जोन में, वायु प्रदूषण के नियंत्रण के लिए राज्य सरकार का पर्यावरण विभाग, वायु (प्रदूषण निवारण और नियंत्रण) अधिनियम, 1981 (1981 का 14) और उसके अधीन बनाए गए नियमों के उपबंधों के अनुसरण में मार्गदर्शक सिद्धांत और विनियम तैयार करेगा।

(8) **बहिस्साव का निस्सारण** -- पारिस्थितिक संवेदी जोन में उपचारित बहिस्साव का निस्सारण, जल (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1974 (1974 का 6) और उसके अधीन बनाए गए नियमों के उपबंधों के अनुसार होगा।

(9) **ठोस अपशिष्ट** -- ठोस अपशिष्टों का निपटान निम्नलिखित रूप में होगा -

- (i) पारिस्थितिक संवेदी जोन में ठोस अपशिष्टों का निपटान भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की समय-समय पर यथासंशोधित अधिसूचना सं. का.आ. 908(अ), तारीख 25 सितंबर, 2000 नगरपालिक ठोस अपशिष्ट (प्रबंध और हथालन) नियम, 2000 के उपबंधों के अनुसार किया जाएगा ;
- (ii) स्थानीय प्राधिकरण जैव निम्नीकरणीय और अजैव निम्नीकरणीय संघटकों में ठोस अपशिष्टों के संपृथक्करण के लिए योजनाएं तैयार करेंगे ;
- (iii) जैव निम्नीकरणीय सामग्री को अधिमानतः खाद बनाकर या कृमि खेती के माध्यम से पुनःचक्रित किया जाएगा ;
- (iv) अकार्बनिक सामग्री का निपटान पारिस्थितिक संवेदी जोन के बाहर पहचान किए गए स्थल पर किसी पर्यावरणीय स्वीकृत रीति में होगा और पारिस्थितिक संवेदी जोन में ठोस अपशिष्टों को जलाना या भस्मीकरण अनुज्ञात नहीं होगा।

(10) **जैव चिकित्सीय अपशिष्ट**- पारिस्थितिक संवेदी जोन में जैव चिकित्सीय अपशिष्टों का निपटान भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की समय-समय पर यथासंशोधित अधिसूचना सं.का.आ.630 (अ) तारीख 20 जुलाई, 1998 द्वारा प्रकाशित जैव चिकित्सीय अपशिष्ट (प्रबंध और हथालन) नियम, 1998 के उपबंधों के अनुसार किया जाएगा।

(11) **यानीय परिवहन** - परिवहन की यानीय गतिविधियां आवास के अनुकूल विनियमित होंगी और इस संबंध में आंचलिक महायोजना में विशेष उपबंध अधिकथित किए जाएंगे और आंचलिक महायोजना के तैयार होने और राज्य सरकार के सक्षम प्राधिकारी के द्वारा अनुमोदित होने तक, मानीटरी समिति प्रवृत्त नियमों और विनियमों के अनुसार यानीय गतिविधियों के अनुपालन को मानीटर करेगी।

(12) **औद्योगिक इकाइयां** - (क) प्रस्तावित पारिस्थितिक संवेदी जोन में विधि के अनुसार स्थापित विद्यमान काष्ठ आधारित उद्योगों के सिवाए नए काष्ठ आधारित उद्योगों की स्थापना को अनुज्ञात नहीं किया जाएगा।

(ख) जल, वायु, मृदा, ध्वनि प्रदूषण कारित करने वाले किसी नए उद्योग की प्रस्तावित पारिस्थितिक संवेदी जोन में स्थापना को अनुज्ञात नहीं किया जाएगा।

4. पारिस्थितिक संवेदी जोन में प्रतिषिद्ध और विनियमित क्रियाकलापों की सूची - पारिस्थितिक संवेदी जोन में सभी क्रियाकलाप पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) के उपबंधों और तद्धीन बनाए गए नियमों द्वारा शासित होंगे और नीचे दी गई तालिका में विनिर्दिष्ट रीति में विनियमित होंगे, अर्थात् :--

सारणी

क्रम सं.	क्रियाकलाप	टीका-टिप्पणी
(1)	(2)	(3)
प्रतिषिद्ध क्रियाकलाप		
1.	वाणिज्यिक खनन, पत्थर की खदान और उनको तोड़ने की इकाइयां।	(क) सभी नए और विद्यमान खनन (लघु और वृहत खनिज), पत्थर उत्खनन और उनको तोड़ने की इकाइयां प्रतिषिद्ध हैं, सिवाय निवासियों की वास्तविक घरेलू आवश्यकताओं के नहीं होंगी, जिसके अंतर्गत गृहों के संनिर्माण या मरम्मत के लिए मिट्टी की खुदाई और व्यक्तिगत उपभोग के लिए गृहों के निर्माण के लिए देशी टाइलों या ईंटों का संनिर्माण भी है। (ख) खनन संक्रियाएं, माननीय उच्चतम न्यायालय की रिट याचिका (सिविल) सं. 1995 का 202 टी.एन. गौडाबर्मन थिरुमूलपाद बनाम भारत सरकार के मामले में आदेश तारीख 4 अगस्त 2006 और रिट याचिका (सी) सं. 2012 का 435 गोवा फाउंडेशन बनाम भारत सरकार के मामले में तारीख 21 अप्रैल 2014 के अंतरिम आदेश के अनुसरण में सर्वदा प्रचालन होगा।
2.	आरा मीलों की स्थापना।	पारिस्थितिक संवेदी जोन के भीतर नई और विद्यमान आरा मीलों का विस्तार अनुज्ञात नहीं होगा।
3.	किसी परिसंकटमय पदार्थों का उपयोग या उत्पादन।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय)।
4.	जल या वायु या मृदा या ध्वनि प्रदूषण कारित करने वाले उद्योगों की स्थापना।	पारिस्थितिक संवेदी जोन के भीतर नए और विद्यमान प्रदूषण कारित करने वाले का विस्तार अनुज्ञात नहीं होगा।
5.	यांत्रिक साधनों द्वारा मछली पकड़ना।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय)।
6.	नई वृहत ताप और जल विद्युत	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के

	परियोजना की स्थापना ।	सिवाय) ।
7.	पहाड़ी ढालों और नदी तटों का संरक्षण ।	सिवाय आंचलिक महायोजना के अधीन अनुज्ञात के किसी संनिर्माण कार्यकलाप को 1 से 10 से अधिक ढाल वाली पहाड़ियों पर और किसी नदी और प्राकृतिक नाले से लगभग 100 मीटर तक अनुज्ञात नहीं किया जाएगा।
8.	जलावन लकड़ी का वाणिज्यिक उपयोग ।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय) ।
9.	प्लास्टिक थैलों का उपयोग ।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय) ।
10.	पर्यटन से संबंधित क्रियाकलाप जैसे गर्म वायु गुब्बारों आदि द्वारा राष्ट्रीय उद्यान के ऊपर से उड़ना जैसे क्रियाकलाप करना।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय) ।
11.	प्राकृतिक जल निकायों या सतही क्षेत्र में अनुपचारित बहिर्वाह और ठोस अपशिष्टों का निस्सारण ।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय) ।
विनियमित क्रियाकलाप		
12.	होटलों और रिसोर्टों की स्थापना ।	राष्ट्रीय पार्क की सीमा के 1 किलोमीटर के भीतर नए वाणिज्यिक होटलों और रिसोर्टों की स्थापना को सिवाए पारिस्थितिक के अनुकूल पर्यटन क्रियाकलापों से संबंधित पर्यटकों के लिए अस्थायी आवास के लिए अनुज्ञात नहीं किया जाएगा । तथापि 1 किलोमीटर से परे और पारिस्थितिक संवेदी जोन के विस्तार तक सभी नए पर्यटन क्रियाकलापों या विद्यमान क्रियाकलापों के विस्तार पर्यटन महायोजना और राष्ट्रीय बाघ संरक्षण प्राधिकरण के दिशा-निर्देश के अनुरूप होंगे ।
13.	संनिर्माण क्रियाकलाप।	संरक्षित क्षेत्र की एक किलोमीटर की सीमा के भीतर किसी भी प्रकार के नए वाणिज्यिक संनिर्माण को अनुज्ञात नहीं किया जाएगा: परंतु स्थानीय लोगों को पैरा 3 के उप पैरा (1) में सूचीबद्ध क्रियाकलापों सहित उनके आवासीय उपयोग के लिए उनकी भूमि में संनिर्माण करने की अनुमति दी जाएगी । ऐसे लघु उद्योगों जो प्रदूषण उत्पन्न नहीं करते हैं, से संबंधित संनिर्माण क्रियाकलाप विनियमित किए जाएंगे और लागू नियमों और विनियमों, यदि कोई हों, के अनुसार सक्षम प्राधिकारी की पूर्व अनुमति से ही न्यूनतम पर रखे जाएंगे । इसके अतिरिक्त, एक किलोमीटर से परे पारिस्थितिक संवेदी जोन के विस्तार तक सद्भावपूर्वक स्थानीय आवश्यकताओं के लिए संनिर्माण और अन्य संनिर्माण क्रियाकलापों को महायोजना के अनुसार विनियमित किया जाएगा।

14.	प्राकृतिक जल निकायों में बहिर्वाह और ठोस अपशिष्ट का निस्सारण ।	लागू विधियों के अधीन विनियमित होंगे ।
15.	वायु और यानिक प्रदूषण ।	लागू विधियों के अधीन विनियमित होंगे ।
16.	ध्वनि प्रदूषण ।	लागू विधियों के अधीन विनियमित होंगे ।
17.	भूमिगत जल का निष्कर्षण।	लागू विधियों के अधीन विनियमित होंगे ।
18.	वृक्षों की कटाई ।	(क) राज्य सरकार में सक्षम प्राधिकारी की पूर्व अनुमति के बिना वन, सरकारी या राजस्व या निजी भूमि पर या वनों में किंहीं वृक्षों की कटाई नहीं होगी । (ख) वृक्षों की कटाई संबंधित केंद्रीय या राज्य अधिनियम या उसके अधीन बनाए गए नियमों के उपबंध के अनुसार विनियमित होगी । (ग) आरक्षित वनों और संरक्षित वनों की दशा कार्ययोजना में दिए गए विवरण का अनुसरण किया जाएगा ।
19.	विद्यमान स्थापना ।	लागू विधियों के अधीन विनियमित होगा ।
20.	विद्युत केबलों और दूरसंचार टावरों का परिनिर्माण ।	भूमिगत केबलों को प्रोत्साहन देना ।
21.	विद्यमान सड़कों को चौड़ा करना और उन्हें सुदृढ़ करना।	उचित पर्यावरण समाघात निर्धारण और न्यूनीकरण उपाय यथा लागू अनुसार होंगे ।
22.	होटलों और लॉज के विद्यमान परिसरों में बाड़ लगाना ।	लागू विधियों के अधीन विनियमित होगा । वन्यजीव के मुक्त संचलन को अनुज्ञात करने के लिए पारिस्थितिक संवेदी जोन के भीतर होटलों या अन्य वाणिज्यिक स्थापन अपनी परिसंपत्तियों में काटेदार से बाड़ नहीं लगाएंगे और कोई भी बाड़ एक मीटर से ऊंची नहीं होगी । कोई विद्यमान बाड़, जो इस उपदर्श का अनुपालन नहीं करती है, को आंचलिक महायोजना में वर्णित समय-सीमा के अनुसार उपांतरित किया जाएगा ।
23.	कृषि प्रणालियों में आमूल परिवर्तन ।	लागू विधियों के अधीन विनियमित होंगे ।
24.	विदेशी प्रजातियों को लाना।	लागू विधियों के अधीन विनियमित होंगे ।
25.	रात्रि में यानिक यातायात का संचलन ।	लागू विधियों के अधीन विनियमित होंगे ।
26.	वाणिज्यिक साइनबोर्ड और होर्डिंग ।	लागू विधियों के अधीन विनियमित होंगे ।
27.	प्रदूषण उत्पन्न न करने वाले लघु उद्योग ।	पारिस्थितिक संवेदी जोन से गैर प्रदूषण, गैर परिसंकटमय, लघु और सेवा उद्योग, कृषि, पुष्प कृषि, उद्यान कृषि या कृषि आधारित देशीय माल से औद्योगिक उत्पादों का उत्पादन उद्योग और जो पर्यावरण पर कोई विपरीत प्रभाव नहीं डालते हैं, को अनुज्ञात किया जाएगा ।
28.	लघु चारे का संग्रहण।	लागू विधियों के अधीन विनियमित होंगे ।
29.	प्रवासी चारवाहे।	लागू विधियों के अधीन विनियमित होंगे ।

30.	टीडी अधिकारी ।	लागू विधियों के अधीन विनियमित होंगे ।
31.	कूड़ा कर्कट डालना ।	लागू विधियों के अधीन विनियमित होंगे ।
32.	जल परिवहन ।	लागू विधियों के अधीन विनियमित होंगे ।
संवर्धित क्रियाकलाप		
33.	चालू कृषि पद्धतियों, पौधा रोपण और अन्य वानिक कार्यकलाप।	सक्रिय रूप से बढ़ावा दिया जाएगा ।
34.	जैविक कृषि	सक्रिय रूप से बढ़ावा दिया जाएगा ।
35.	सभी गतिविधियों के लिए हरित प्रौद्योगिकी को ग्रहण करना ।	सक्रिय रूप से बढ़ावा दिया जाएगा ।
36.	कुटीर उद्योगों जिसके अंतर्गत ग्रामीण कारीगर आदि भी हैं ।	सक्रिय रूप से बढ़ावा दिया जाएगा ।
37.	हिम /वर्षा जल संचयन।	सक्रिय रूप से बढ़ावा दिया जाएगा।
38.	नवीकरणीय ऊर्जा स्रोत का उपयोग ।	सक्रिय रूप से बढ़ावा दिया जाएगा ।

5. मानीटरी समिति- (1) केंद्रीय सरकार, पारिस्थितिक संवेदी जोन के प्रभावी मानीटरी के लिए एक मानीटरी समिति का गठन करेगी जो निम्नलिखित से मिलकर बनेगी, अर्थात् :-

- | | | |
|-------|--|-------------|
| (i) | उपायुक्त, लाहोल - स्पीति जिला | अध्यक्ष |
| (ii) | पर्यावरण (जिसके अंतर्गत विरासत संरक्षण भी है) के क्षेत्र में कार्य करने वाले गैर सरकारी संगठनों में से हिमाचल प्रदेश सरकार द्वारा एक वर्ष के लिए नामनिर्दिष्ट किया जाने वाला एक विशेषज्ञ | सदस्य |
| (iii) | पारिस्थितिक और पर्यावरण के क्षेत्र से हिमाचल प्रदेश सदस्य सरकार द्वारा एक वर्ष की अवधि के लिए नामनिर्दिष्ट किया जाने वाला एक विशेषज्ञ | सदस्य |
| (iv) | हिमाचल प्रदेश प्रदूषण नियंत्रण बोर्ड का प्रतिनिधि | सदस्य |
| (v) | क्षेत्र का ज्येष्ठ नगर योजनाकार | सदस्य |
| (vi) | उप प्रभागीय मजिस्ट्रेट , काजा | सदस्य |
| (vii) | प्रभागीय वन अधिकारी , काजा | सदस्य-सचिव। |

6. निर्देश निबंधन

(2) पारिस्थितिक संवेदी जोन समिति इस अधिसूचना के उपबंधों के अनुपालन को मानीटर करेगी ।

(3) पारिस्थितिक संवेदी जोन में भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना सं. का.आ. 1533(अ) तारीख 14 सितंबर, 2006 की अनुसूची में के अधीन सम्मिलित क्रियाकलापों और इस अधिसूचना के पैरा 4 के अधीन प्रतिषिद्ध गतिविधियों के सिवाय आने वाले ऐसे क्रियाकलापों की दशा में वास्तविक विनिर्दिष्ट स्थलीय दशाओं पर आधारित मानीटरी समिति द्वारा संवीक्षा की जाएगी और उक्त अधिसूचना के उपबंधों के अधीन पूर्व पर्यावरण निकासी के लिए केन्द्रीय सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को निर्दिष्ट की जाएगी ।

(4) इस अधिसूचना के पैरा 4 के अधीन यथा विनिर्दिष्ट प्रतिषिद्ध क्रियाकलापों के सिवाय, भारत सरकार के पर्यावरण और वन मंत्रालय की अधिसूचना संख्यांक का.आ. 1533(अ) तारीख 14 सितंबर, 2006 की अधिसूचना के अनुसूची के अधीन ऐसे क्रियाकलापों, जिन्हें सम्मिलित नहीं किया गया है, परंतु पारिस्थितिक संवेदी जोन में आते

हैं, ऐसे क्रियाकलापों की वास्तविक विनिर्दिष्ट स्थलीय दशाओं पर आधारित मानीटरी समिति द्वारा संवीक्षा की जाएगी और उसे संबद्ध विनियामक प्राधिकरणों को निर्दिष्ट किया जाएगा।

(5) मानीटरी समिति का सदस्य-सचिव या संबद्ध उपायुक्त, ऐसे व्यक्ति के विरुद्ध, जो इस अधिसूचना के किसी उपबंध का उल्लंघन करता है, पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 19 के अधीन परिवाद फाइल करने के लिए सक्षम होगा।

(6) मानीटरी समिति मुद्दा दर मुद्दा के आधार पर अपेक्षाओं पर निर्भर रहते हुए संबद्ध विभागों के प्रतिनिधियों या विशेषज्ञों, औद्योगिक संगमों या संबद्ध पणधारियों के प्रतिनिधियों को अपने विचार-विमर्श में सहायता के लिए आमंत्रित कर सकेगी।

(7) मानीटरी समिति प्रत्येक वर्ष की 31 मार्च तक की राज्य के मुख्य वन्यजीव रक्षक को अपनी वार्षिक कार्रवाई रिपोर्ट **उपाबंध III** पर उपाबद्ध रूप विधान के अनुसार उक्त वर्ष के 30 जून तक प्रस्तुत करेगी।

(8) केन्द्रीय सरकार का पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय मानीटरी समिति को अपने कृत्यों के प्रभावी निर्वहन के लिए समय-समय पर ऐसे निदेश दे सकेगा, जो वह ठीक समझे।

7. इस अधिसूचना के उपबंध, भारत के माननीय उच्चतम न्यायालय या उच्च न्यायालय या राष्ट्रीय हरित प्राधिकरण द्वारा पारित कोई आदेश या पारित होने वाले किसी आदेश, यदि कोई हों, के अधीन होंगे।

[फा. सं. 25/192/2015-ईएसजेड-आरई]

डॉ. टी. चांदनी, वैज्ञानिक 'जी'

उपाबंध-I

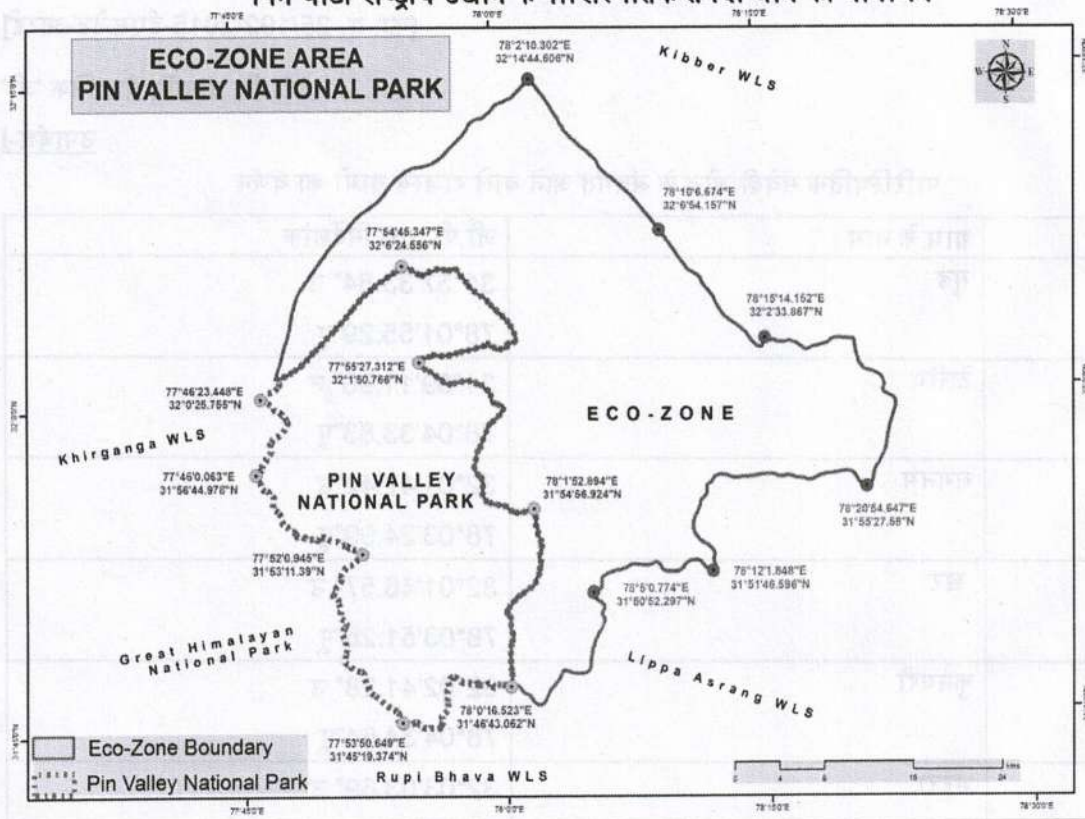
पारिस्थितिक संवेदी जोन के अंतर्गत आने वाले राजस्व ग्रामों का वर्णन

क्र.सं	ग्राम के नाम	जी.पी. एस निर्देशांक
1	मुड	31*57'33.84" उ 78*01'55.29" पू
	टेलींग	31*59'11.96" उ 78*04'33.83" पू
3	सगनम	32*01'47.42" उ 78*03'24.99" पू
4	खर	32*01'46.57" उ 78*03'51.26" पू
5	कुतगरी	32*02'41.28" उ 78*04'34.64" पू
6	भररा	32*03'03.69" उ 78*05'25.39" पू
7	गुलिंग	32*02'38.74" उ 78*05'25.39" पू

8	तनगना गानगमा	32°02'51.54" उ 78°07'20.01" पू
9	तनगना यानगमा	32°02'40.69" उ 78°06'53.00" पू
10	चेइउथ	32°02'45.75" उ 78°05'07.2" पू
11	का	32°02'45.75" उ 78°01'24.81" पू
12	चीडनग	32°03'33.41" उ 78°07'41.52" पू
13	मिक्किम	32°02'17.09" उ 78°03'37.87" पू

उपाबंध-II

पिन घाटी राष्ट्रीय उद्यान के पारिस्थितिक संवेदी जोन का मानचित्र



उपाबंध-III**पारिस्थितिक संवेदी जोन मानीटरी समिति - की गई कार्रवाई की रिपोर्ट का रूप विधान**

1. बैठकों की संख्या और तिथि।
2. बैठकों का कार्यवृत्त : कृपया मुख्य उल्लेखनीय बिंदुओं का वर्णन करें। बैठक के कार्यवृत्त को एक पृथक् अनुबंध में उपाबंध करें।
3. आंचलिक महायोजना की तैयारी की प्रास्थिति जिसके अंतर्गत पर्यटन महायोजना।
4. भू-अभिलेख में सदृश्य त्रुटियों के सुधार के लिए ब्यौहार किए गए मामलों का सारांश।
5. पर्यावरण समाघात निर्धारण अधिसूचना, 2006 के अधीन आने वाली गतिविधियों की संविक्षा के मामलों का सारांश। ब्यौरे एक पृथक् उपाबंध के रूप में उपाबंध किए जा सकते हैं।
6. पर्यावरण समाघात निर्धारण अधिसूचना, 2006 के अधीन न आने वाली गतिविधियों की संविक्षा के मामलों का सारांश। ब्यौरे एक पृथक् उपाबंध के रूप में उपाबंध किए जा सकते हैं।
7. पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 19 के अधीन दर्ज की गई शिकायतों का सारांश।
8. कोई अन्य महत्वपूर्ण विषय।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE**NOTIFICATION**

New Delhi, the 11th March, 2016

S.O. 1053(E).—The following draft of the notification, which the Central Government proposes to issue in exercise of the powers conferred by sub-section (1), read with clause (v) and clause (xiv) of sub-section (2) and sub-section (3) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) is hereby published, as required under sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, for the information of the public likely to be affected thereby; and notice is hereby given that the said draft notification shall be taken into consideration on or after the expiry of a period of sixty days from the date on which copies of the Gazette containing this notification are made available to the public;

Any person interested in making any objections or suggestions on the proposals contained in the draft notification may forward the same in writing, for consideration of the Central Government within the period so specified to the Secretary, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jorbagh Road, Aliganj, New Delhi-110003, or send it to the e-mail address of the Ministry at eszmef@nic.in.

Draft Notification

Whereas, Pin Valley National Park situated between 31°6'40" to 32°2'20" N latitude and 77°4'21" to 78°6'19" E longitude in the Lahul-Spiti District of Himachal Pradesh is spread over an area of 675 square kilometres. The entire area is very rich in Biodiversity and has historical, economic and medicinal significance;

And Whereas, the key species found in the said National Park are snow leopard, ibex, golden eagle, red fox, blue sheep and brown bear;

And Whereas, it is necessary to conserve and protect the area surrounding the protected area of Pin Valley National Park as Eco-sensitive zone from ecological, environmental and biodiversity point of view;

Now Therefore, in exercise of the powers conferred by sub-section(1) and clauses (v) and (xiv) of sub-section (2) and sub-section (3) of section 3 of the Environment (Protection) Act 1986 (29 of 1986) read with sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby

notifies an area with an extent varying from 0 to 45.82 kms around the boundary of Pin Valley National Park in the State of Himachal Pradesh as the Pin Valley National Park Eco-sensitive Zone (hereinafter referred to as the Eco-sensitive Zone) details of which are as under, namely:-

1. Extent and boundaries of Eco-sensitive Zone.—(1) The Eco-Sensitive Zone shall be of 1150 square kilometres around the Pin Valley National Park with an extent up to 45.82 kilometre. The Eco-sensitive Zone has been proposed on the North –West, North-East and South- East of the Pin Valley National Park as indicated in the map. Whereas South –West part of the National Park is in continuity with other protected areas such as Khirganga Wildlife Sanctuary, Great Himalayan National Park, Rupi-Bhawa Wildlife Sanctuary and Lippa Asrang Wildlife Sanctuary hence no Eco-sensitive Zone has been proposed in this part of Pin Valley National Park.

(2) The list of 13 villages and their GPS co-ordinates falling under the said Eco-sensitive Zone is annexed as Annexure-I.

(3) The map of the Eco-sensitive Zone along with boundary details and latitudes and longitudes is appended as **Annexure-II**.

2. Zonal Master Plan for the Eco-sensitive Zone.—(1) The State Government shall, for the purpose of the Eco-sensitive Zone prepare, a Zonal Master Plan, within a period of two years from the date of publication of final notification in the Official Gazette, in consultation with local people and adhering to the stipulations given in this notification.

(2) The said Plan shall be approved by the competent authority in the State Government.

(3) The said Master Plan for the Eco-sensitive Zone shall be prepared by the State Government in such a manner as is specified in this notification and also in consonance with the relevant Central and State laws and the guidelines issued by the Central Government, if any.

(4) The said Master Plan shall be prepared in consultation with all concerned State Departments, namely:-

- (i) Environment,
- (ii) Forest,
- (iii) Urban Development,
- (iv) Tourism,
- (v) Municipal,
- (vi) Revenue,
- (vii) Agriculture,
- (viii) Himachal Pradesh State Pollution Control Board,
- (ix) Irrigation,
- (x) Public Works Department,

for integrating environmental and ecological considerations into it.

(5) The said Plan shall not impose any restriction on the approved existing land use, infrastructure and activities, unless so specified in this notification and the said Master Plan shall factor in improvement of all infrastructure and activities to be more efficient and eco-friendly.

(6) The said Master Plan shall provide for restoration of denuded areas, conservation of existing water bodies, management of catchment areas, watershed management, groundwater management, soil and moisture conservation, needs of local community and such other aspects of the ecology and environment that needs attention.

(7) The said Master Plan shall demarcate all the existing worshipping places, village and urban settlements, types and kinds of forests, tribal areas, agricultural areas, fertile lands, green area, such as, parks and like places, horticultural areas, orchards, lakes and other water bodies.

(8) The said Master Plan shall regulate development in Eco-sensitive Zone so as to ensure eco-friendly development for livelihood security of local communities.

3. Measures to be taken by State Government.—The State Government shall take the following measures for giving effect to the provisions of this notification, namely:-

(1) **Land use.**— Forests, horticulture areas, agricultural areas, parks and open spaces earmarked for recreational purposes in the Eco-sensitive Zone shall not be used or converted into areas for commercial or industrial related development activities:

Provided that the conversion of agricultural lands within the Eco-sensitive Zone may be permitted on the recommendation of the Monitoring Committee, and with the prior approval of the State Government, to meet the residential needs of local residents, and for the activities listed against serial numbers 12, 21, 27, 36 and 37 in column (2) of the Table in paragraph 4, namely:-

- (i) Eco-friendly cottages for temporary occupation of tourists, such as tents, wooden houses, etc. for eco-friendly tourism activities,
- (ii) Widening and strengthening of existing roads and construction of new roads.
- (iii) Small scale industries not causing pollution,
- (iv) Rainwater harvesting, and
- (v) Cottage industries including village industries, convenience stores and local amenities:

Provided further that no use of tribal land shall be permitted for commercial and industrial development activities without the prior approval of the State Government and without compliance of the provisions of article 244 of the constitution or the law for the time being in force, including the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007):

Provided also that any error appearing in the land records within the Eco-sensitive Zone shall be corrected by the State Government, after obtaining the views of Monitoring Committee, once in each case and the correction of said error shall be intimated to the Central Government in the Ministry of Environment, Forest and Climate Change:

Provided also that the above correction of error shall not include change of land use in any case except as provided under this sub-paragraph:

Provided also that there shall be no consequential reduction in green area, such as forest area and agricultural area and efforts shall be made to reforest the unused or unproductive agricultural areas.

(2) **Natural springs.**-The catchment areas of all natural springs shall be identified and plans for their conservation and rejuvenation shall be incorporated in the Zonal Master Plan and the guidelines shall be drawn up by the State Government in such a manner as to prohibit development activities at or near these areas which are detrimental to such areas.

(3) **Tourism.**- (a) The activity relating to tourism within the Eco-sensitive Zone shall be as per Tourism Master Plan, which shall form part of the Zonal Master Plan.

(b) The Tourism Master Plan shall be prepared by Department of Tourism, in consultation with Department of Forests and Environment of the State Government.

(c) The activity of tourism shall be regulated as under, namely:-

(i) all new tourism activities or expansion of existing tourism activities within the Eco-sensitive Zone shall be in accordance with the guidelines issued by the Central Government in the Ministry of Environment, Forests and Climate Change with emphasis on eco-tourism, eco-education and eco-development and based on carrying capacity study of the Eco-sensitive Zone;

(ii) new construction of hotels and resorts shall not be permitted within one kilometer from the boundary of the Pin Valley National Park except for accommodation for temporary occupation of tourists related to Eco-friendly tourism activities:

(iii) till the Zonal Master Plan is approved, development for tourism and expansion of existing tourism activities shall be permitted by the concerned regulatory authorities based on the actual site specific scrutiny and recommendation of the Monitoring Committee.

(4) **Natural heritage.**- All sites of valuable natural heritage in the Eco-sensitive Zone, such as the gene pool reserve areas, rock formations, waterfalls, springs, gorges, groves, caves, points, walks, rides, cliffs, etc., shall be identified and preserved and plan shall be drawn up for their protection and conservation, within six months from the date of publication of this notification and such plan shall form part of the Zonal Master Plan.

(5) **Man-made heritage sites.**- Buildings, structures, artefacts, areas and precincts of historical, architectural, aesthetic and cultural significance shall be identified in the Eco-sensitive Zone and plans for

their conservation shall be prepared within six months from the date of publication of this notification and incorporated in the Zonal Master Plan.

(6) **Noise pollution.**—The Environment Department of the State Government or Himachal Pradesh State Pollution Control Board shall draw up guidelines and regulations for the control of noise pollution in the Eco-sensitive Zone in accordance with the provisions of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) and the rules made thereunder.

(7) **Air pollution.**—The Environment Department of the State Government or Himachal Pradesh State Pollution Control Board shall draw up guidelines and regulations for the control of air pollution in the Eco-sensitive Zone in accordance with the provisions of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) and the rules made thereunder.

(8) **Discharge of effluents.**—The discharge of treated effluent in Eco-sensitive Zone shall be in accordance with the provisions of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) and the rules made thereunder.

(9) **Solid wastes.**—Disposal of solid wastes shall be as under:-

(i) the solid waste disposal in Eco-sensitive Zone shall be carried out as per the provisions of the Municipal Solid Waste (Management and Handling) Rules, 2000 published by the Government of India in the erstwhile Ministry of Environment and Forests *vide* notification number S.O. 908(E), dated the 25th September, 2000 as amended from time to time;

(ii) the local authorities shall draw up plans for the segregation of solid wastes into biodegradable and non-biodegradable components;

(iii) the biodegradable material shall be recycled preferably through composting or vermiculture;

(iv) the inorganic material may be disposed in an environmentally acceptable manner at site identified outside the Eco-sensitive Zone and no burning or incineration of solid wastes shall be permitted in the Eco-sensitive Zone.

(10) **Bio-medical waste.**—The bio-medical waste disposal in the Eco-sensitive Zone shall be carried out as per the provisions of the Bio-Medical Waste (Management and Handling) Rules, 1998 published by the Government of India in the erstwhile Ministry of Environment and Forests *vide* notification number S.O. 630(E), dated the 20th July, 1998 as amended from time to time.

(11) **Vehicular traffic.** - The vehicular movement of traffic shall be regulated in a habitat friendly manner and specific provisions in this regard shall be incorporated in the Zonal Master Plan and till such time as the Zonal Master Plan is prepared and approved by the competent authority in the State Government, Monitoring Committee shall monitor compliance of vehicular movement under the relevant Acts and the rules and regulations made thereunder.

(12) **Industrial units.**—(a) No establishment of new wood based industries within the proposed Eco-sensitive Zone shall be permitted except the existing wood based industries set up as per the law.

(b) No establishment of any new industry causing water, air, soil, noise pollution within the proposed Eco-sensitive Zone shall be permitted.

4. **List of activities prohibited or to be regulated within the Eco-sensitive Zone.**—All activities in the Eco sensitive Zone shall be governed by the provisions of the Environment (Protection) Act, 1986 (29 of 1986) and the rules made thereunder, and be regulated in the manner specified in the table below, namely:-

TABLE

Sl.No.	Activity	Remarks
(1)	(2)	(3)
Prohibited activities		
1.	Commercial mining, stone quarrying and crushing units.	(a) All new and existing mining (minor and major minerals), stone quarrying and crushing units shall be prohibited except for the domestic needs of <i>bona fide</i> local residents including digging of earth for construction or repair of houses and for manufacture of country tiles or bricks for housing for personal consumption. (b) The mining operations shall strictly be in accordance with the orders of the Hon'ble Supreme Court dated the 4 th August, 2006 in the matter of T.N. Godavarman Thirumulpad Vs. Union of India in Writ Petition (Civil) No.202 of 1995 and order of the Hon'ble Supreme Court dated the 21 st April, 2014 in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No.435 of 2012.
2.	Setting up of saw mills.	No new or expansion of existing saw mills shall be permitted within the Eco-sensitive Zone.
3.	Use or production of any hazardous substances.	Prohibited (except as otherwise provided) as per applicable laws.
4.	Setting up of industries causing water or air or soil or noise pollution.	No new or expansion of polluting industries in the Eco-sensitive Zone shall be permitted.
5.	Fishing by mechanical means.	Prohibited (except as otherwise provided) as per applicable laws.
6.	Establishment of major thermal and hydro-electric projects.	Prohibited (except as otherwise provided) as per applicable laws.
7.	Protection of hill slopes and river banks.	No construction activity unless otherwise permitted by State Level Committee shall be undertaken on the hill with slopes more than 1 to 10 and also up to 100 meters from the banks of any river, and natural nallah.
8.	Commercial use of firewood.	Prohibited (except as otherwise provided) as per applicable laws.
9.	Use of plastic bags.	Prohibited (except as otherwise provided) as per applicable laws.
10.	Undertaking activities related to tourism like over-flying the National Park Area by aircraft, hot-air balloons.	Prohibited (except as otherwise provided) as per applicable laws.
11.	Discharge of untreated effluents in natural water bodies or land area.	Prohibited (except as otherwise provided) as per applicable laws.
Regulated activities		
12.	Establishment of hotels and resorts.	No new commercial hotels and resorts shall be permitted within one kilometer of the boundary of the protected area except for

		accommodation for temporary occupation of tourists related to eco-friendly tourism activities. However, beyond one kilometer and up to the extent of the Eco-sensitive Zone all new tourism activities or expansion of existing activities would in conformity with the Tourism Master Plan.
13.	Construction activities.	a) No new commercial construction of any kind shall be permitted within one kilometer from the boundary of the Eco-sensitive Zone: Provided that, local people shall be permitted to undertake construction in their land for their residential use including the activities listed in sub-paragraph (1) of paragraph 3: Provided further that the construction activity related to small scale industries not causing pollution shall be regulated and kept at the minimum, with the prior permission from the Competent Authority as per applicable rules and regulations, if any. Further, beyond one kilometer up to the extent of Eco-Sensitive Zone construction for <i>bone fide</i> local needs shall be allowed and other construction activities shall be regulated as per Zonal Master Plan.
14.	Discharge of effluents and solid waste in natural water bodies or land area.	Regulated under applicable laws.
15.	Air and vehicular pollution.	Regulated under applicable laws.
16.	Noise pollution	Regulated under applicable laws.
17.	Extraction of ground water.	Regulated under applicable laws.
18.	Felling of trees.	(a) There shall be no felling of trees in the forest or Government or revenue or private lands without prior permission of the Competent Authority in the State Government; (b) the felling of trees shall be regulated in accordance with the provisions of the concerned Central or State Acts and the rules made thereunder. (c) in case of Reserve Forests and Protected Forests the Working Plan prescriptions shall be followed.
19.	Existing establishments.	Regulated under applicable laws.
20.	Insulation of electric lines.	Promote underground cabling.
21.	Widening and strengthening of existing roads.	Shall be done with proper Environment Impact Assessment and mitigation measures, as applicable.
22.	Fencing of existing premises of hotels and lodges.	Regulated under applicable laws. In order to allow free movement of wildlife, hotels or other commercial establishments within the Eco-sensitive Zone shall not fence their properties with barbed wire and no fence shall be higher than one meter. Any existing fence not complying with this stipulation shall be modified as per the time lines mentioned in the Zonal Master Plan.
23.	Drastic change of agriculture systems.	Regulated under applicable laws.
24.	Introduction of exotic species.	Regulated under applicable laws.
25.	Movement of vehicular traffic at night.	Regulated under applicable laws.
26.	Sign boards and hoardings.	Regulated under applicable laws.
27.	Small scale industries not causing pollution.	Non-polluting, non-hazardous, small-scale and service industry, agriculture, floriculture, horticulture or agro-based industry

		producing products from indigenous goods from the Eco-sensitive Zone, and which do not cause any adverse impact on environment shall be permitted.
28.	Collection of small fodder.	Regulated under applicable laws.
29.	Migratory Grazing.	Regulated under applicable laws.
30.	TD Rights.	Regulated under applicable laws.
31.	Muck Dumping.	Regulated under applicable laws.
32.	Water Transportation.	Regulated under applicable laws.
Promoted activities		
33.	Ongoing agriculture practices, plantation and other forestry activity.	Shall be actively promoted.
34.	Organic farming.	Shall be actively promoted.
35.	Adoption of green technology for all activities.	Shall be actively promoted.
36.	Cottage industries including village artisans.	Shall be actively promoted.
37.	Snow/Rain water harvesting.	Shall be actively promoted.
38.	Use of renewable energy sources.	Shall be actively promoted.

5. Monitoring Committee.—(1) The Central Government hereby constitutes a Monitoring Committee, for effective monitoring of the Eco-sensitive Zone, which shall comprise of the following namely:-

- | | | |
|-------|---|--------------------|
| (i) | Deputy Commissioner, Lahol-Spiti District | Chairman; |
| (ii) | One representative of Non-Governmental Organisations working in the field of environment (including heritage conservation) to be nominated by the Government of Himachal Pradesh for a period of one year | Member; |
| (iii) | An expert in the area of ecology and environment to be nominated by the Government of Himachal Pradesh for a period of one year | Member; |
| (iv) | Representative Himachal Pradesh Pollution Control Board | Member; |
| (v) | Senior Town Planner of the area | Member; |
| (vi) | Sub-Divisional Magistrate, Kaza | Member; |
| (vii) | Divisional Forest Officer, Kaza | Member- Secretary. |

6. Terms of Reference

- (2) The Monitoring Committee shall monitor the compliance of the provisions of this notification.
- (3) The activities that are covered in the schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forest number S.O. 1533(E), dated the 14th September, 2006, and are falling in the Eco-sensitive Zone, except the prohibited activities as specified in column (3) of the Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the Central Government in the Ministry of Environment, Forest and Climate Change for prior environmental clearances under the provisions of the said notification.
- (4) The activities that are not covered in the schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forests number S.O. 1533(E), dated the 14th September,

2006 but are falling in the Eco-sensitive Zone, except the prohibited activities as specified in column (3) of the Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the concerned regulatory authorities.

- (5) The Member-Secretary of the Monitoring Committee or the concerned Collector or the concerned ark in-charge shall be competent to file complaints under section 19 of the Environment (Protection) Act, 1986 against any person who contravenes the provisions of this notification.
 - (6) The Monitoring Committee may invite representatives or experts from concerned Departments, representatives from industry associations or concerned stakeholders to assist in its deliberations depending on the requirements on issue to issue basis.
 - (7) The Monitoring Committee shall submit the annual action taken report of its activities as on 31st March of every year by 30th June of that year to the Central Government in the Ministry of Environment, Forests and Climate Change as per proforma given in **Annexure III**.
 - (8) The Central Government in the Ministry of Environment, Forests and Climate Change may give such directions, as it deems fit, to the Monitoring Committee for effective discharge of its functions.
7. The provisions of this Notification are subject to the orders, if any, passed, or to be passed, by the Hon'ble Supreme Court of India or the High Court or National Green Tribunal.

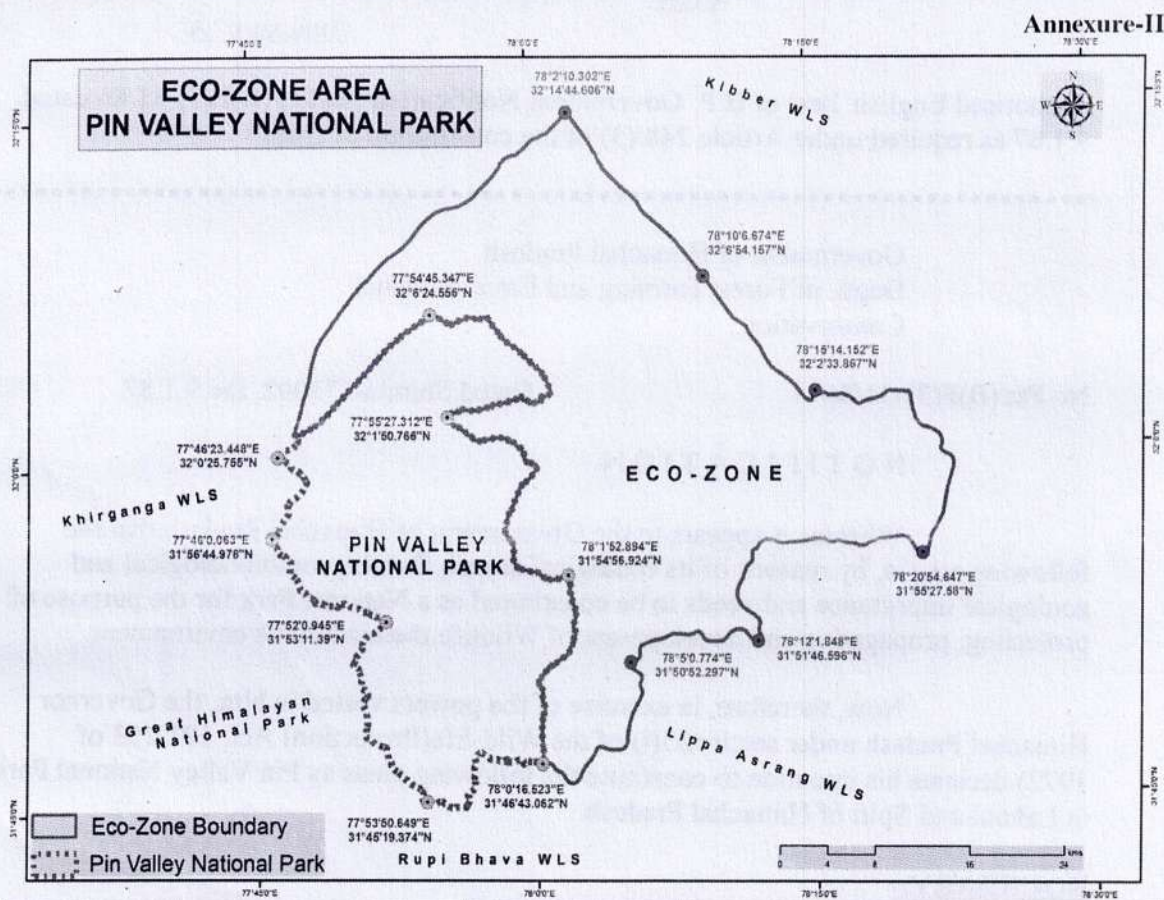
[F. No. 25/192/2015-ESZ-RE]

Dr. T. CHANDINI, Scientist 'G'

Annexure-I

Detail of revenue Villages within the proposed Eco-sensitive Zone

S. No.	Name of Village	GPS Co-ordinates
1	Mud	31°57'33.84" N 78°01'55.29" E
2	Telling	31°59'11.96" N 78°04'33.83" E
3	Sagnam	32°01'47.42" N 78°03'24.99" E
4	Khar	32°01'46.57" N 78°03'51.26" E
5	Kungari	32°02'41.28" N 78°04'34.64" E
6	Bharr	32°03'03.69" N 78°05'25.39" E
7	Gulling	32°02'38.74" N 78°05'25.39" E
8	Tangti Yongma	32°02'51.54" N 78°07'20.01" E
9	Tangti Gongma	32°02'40.69" N 78°06'53.00" E
10	Cheuth	32°02'45.75" N 78°05'07.2" E
11	Kaa	32°02'45.75" N 78°01'24.81" E
12	Chhidang	32°03'33.41" N 78°07'41.52" E
13	Mikkim	32°02'17.09" N 78°03'37.87" E

**ANNEXURE-III****Performa of Action Taken Report: - Eco-sensitive Zone Monitoring Committee.—**

1. Number and date of meetings.
2. Minutes of the meetings: mention main noteworthy points. Attach minutes of the meeting as separate Annexure.
3. Status of preparation of Zonal Master Plan including Tourism Master Plan.
4. Summary of cases dealt for rectification of error apparent on face of land record (Eco-sensitive Zone wise).
[Details may be attached as Annexure]
5. Summary of cases scrutinised for activities covered under the Environment Impact Assessment notification, 2006.
[Details may be attached as separate Annexure]
6. Summary of cases scrutinised for activities not covered under the Environment Impact Assessment notification, 2006.
[Details may be attached as separate Annexure]
7. Summary of complaints lodged under section 19 of the Environment (Protection) Act, 1986.
8. Any other matter of importance.

Authorised English Text of H.P. Government Notification No.Fts (B)F(7)-31/86 dated 9.1.87 as required under Article 248 (3) of the constitution of India.

.....

Government of Himachal Pradesh
Deptt. of Forest Farming and Environmental
Conservation.

No.Fts.(B)F(7)-31/86

Dated, Shimla-171002, the 9.1.87.

NOTIFICATION

Whereas it appears to the Government of Himachal Pradesh that the following area is, by reasons of its ecological faunal, floral, geomorphological and zoological importance and needs to be constituted as a National Park for the purpose of protecting, propagation and development of Wildlife therein and its environment.

Now, therefore, in exercise of the powers vested in him, the Governor Himachal Pradesh under section 35(i) of the Wild-life(Protection) Act, 1972(53 of 1972) declares his intention to constitute the following areas as Pin Valley National Park, in Lahoul and Spiti of Himachal Pradesh.

BOUNDARY:-

North:- North boundary starts from the highest peak of Bara Shigri glacier(height 6632 metres) on the district boundary of Kullu and Lahoul Spiti District then follows the ridge Hundugma upto the top of river Ratang (height 5800 Metres), then along the ridge separating the water sheds of Khaminger khad and Kidulcho on the one side and river Ratang on the other ending on the top of Kidul cho (height 5835 metres).

East:- From top of Kidul Cho the boundary follows the Kidul Cho down stream upto the confluence with river Parahio. Then along the Parahio river upstream upto origin of Darbang ridge, separating the watersheds of Pin river and Kulung nala(height 3700 metres. Then along the Darbang ridge upto Larang La (height 5370 metres). From Larang La along the Larang La Khad down stream upto its confluence with Pin river. Then along Pin river upstream upto its top Tari Khango (height 4865 metres) to meet the district boundary of Kinnaur and Lahoul Spiti.

South:- From Tari Khango the park boundary follows the district boundary of Kinnaur and Kullu on one side and Lahaul and Spiti on the other side up to Shakrang Khango (height 5100 metres).

West:- From Shakrang Khango along district boundary of Kullu and Lahoul Spiti district through Pin Parvati Pass up to top of Bara Shigri glacier(height 6632 metres).

Area:- Area of National Park-675 Sq.Kms(Approx.)

BUFFER ZONE BOUNDARY:-

North:- From the top of Ratang river(height 5800 metres) the boundary follows the Ratang river down stream upto its confluence with Spiti river.

EAST:- From the confluence of Ratang and Spiti river, the boundary follows the Spiti river upto Pomarang village situated on the confluence of Spiti river and Tipta Nallah. Then along Tipta Nallah upstream upto its top Singe Kang to meet district boundary of Kinnaur and Lahoul & Spiti.

SOUTH:- From Singe Kang the buffer boundary follows the district boundary of Lahoul and Spiti upto Shakrang Khango.

WEST:- From Shakrang Khango along district boundary of Lahoul and Spiti along Pin parvati Pass upto peak of Bara Shigri Glacier (height 6632 metres)

BUFFER ZONE AREA:-Buffer Zone Area-1150 Sq.Kms.(Approx).

SANCTOM-SANCTORUM:-

The area of high wildlife densities requiring absolute protection of research or other wildlife management purpose will be identified with the park area after careful studies and will be termed as Sanctom & Sanctorum or total wilderness zone.

BY ORDER

Sd/-

S.K. CHAUHAN, IAS.

Secretary(Forests) to the Govt. of
Himachal Pradesh.

Approved
Sd/-

Pr. Chief Conservator of Forests (WL)
and Chief Wildlife Warden (HP) Shimla

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Part II - The following information is being furnished to you for your information only. It is not intended to be used for any other purpose.

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SECTION 2 - SPECIFIC INFORMATION

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BY ORDER

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2.4 The following information is being furnished to you for your information only. It is not intended to be used for any other purpose.



Himachal Pradesh
Forest Department
Wildlife Wing