DEOSAI

MANAGEMENT PLAN FOR NATIONAL PARK

OPERATIONAL DOCUMENT

2020-2025

This management plan document is a result of collective efforts and support from several individuals and institutions. We would like to express our deep and sincere gratitude to Government of Italy, Emanuala Benini- Director Italian Agency for Development Cooperation Pakistan, Mr. Shahid Zaman- Secretary Forest, Wildlife and Environment, Government of Gilgit-Baltistan, Mr. Mahmood Ghaznavi- Conservator Parks & Wildlife (Gilgit- Baltistan), Mr. Irfanullah Khan NPM-MPA Project UNDP, Mr. Amanullah Khan Country Assistant Director-UNDP, Mr. Aftab Mahmood- Conservator of Forests (Baltistan), Mr. Muhammad Akram- WLMO DNP and his team, Dr. Babar Khan, Director (Wildlife) / Regional Head (Sindh-Balochistan), WWF-Pakistan, Mr. Waqar Zakarya from Hagler Bailly and Dr. Anis ur Rehman of the Himalayan Wildlife Foundation (HWF), Agostino Da Polenza, Stefania Mondini, Elisa Vuillermoz, Maurizio Gallo, Mr. Ashiq Ahmad Khan, Scientific Representative -Ev-K2-CNR, Mr. Abid Ali- Director CKNP, Mr. Yasir Abbas- Ecologist CKNP, University Of Baltistan and other colleagues of Ev-K2-CNR for their continuous support, encouragement and guidance throughout the assignment.

We express our gratitude to the communities that we worked with very closely to discover their experiences and knowledge as this task would never have been accomplished without sharing of knowledge. In particular, we would like to thank government tourism department, government agriculture, livestock and fisheries department, district administrations, as well as government of Gilgit Baltistan for support.

Admittedly, we may not be able to thank every individual for the support, however, we are greatly indebted to everyone who have been of any support in writing this management plan.

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1. MANAGEMENT PLAN PLANNING OF DNP

1.1. Introduction

Review of the planning documents is a routine activity that is undertaken normally to assess the feasibility and implementation status of various prescriptions and action plans that are proposed by a management plan for a specified period. This is also being used to add or ditch certain actions that have been emergent over a period or gone redundant because of the termination or solution of an issue of the past.

The current review is mostly relevant to the second category since the DNP management plan, which was approved in 2016, has not been implemented so far.

Deosai National Park (DNP) a site declared as a National Park in 1993 by the government of Gilgit-Baltistan. (then called Northern Areas administration) under the GB Wildlife Act (1975) That are too strict in favor of the conservation of the Park's biodiversity with special emphasis on maintaining the landscape/habitats of the Park in as much natural in form as possible. This is where we see conflicts of various nature and extent in almost each National Park of Pakistan. In reality, none of the Parks in Pakistan was free from human uses when these were declared as protected. Since there was no compensation for such uses and rights offered to the users, most of the original uses not only continued rather got even intensified that changed the natural looks and characters of some of the Parks, DNP being no exception.

Normally it is highly confusing when management planning of a Protected Area is attempted with some of the negative uses are there with many more are clearly emerging in the near future. The management plan, if written with the legal parameters becomes too difficult for the Park managers to implement. However, though more convenient to accommodate the activities that are already being carried out in the Park, but it also has to accommodate some of the development works that are clearly in conflict with the Park rules.

Review of the existing management plan does include both directly and indirectly, the threats that are being faced by the Park but there does not seems to be enough capacities and efforts to implement the various prescriptions of the plan. Moreover, some of the problems and threats have recently been emerged that were not known to the then planning team, nor could these be predicted. Accordingly, though most of the contents of the management plan are still valid, some have to be added.

DNP is part of the Deosai Plateau the second highest in the world and highest on the Himalayas, with an incredible ecology and hosting the largest intact population of Himalayan Brown bear in Himalayas. It was recently discovered that almost half of the Bear population spent, at least, a part of their life outside the Park. Such population, since stay closer to human habitations, often stay vulnerable. Although there is not a clear evidence as why such populations have gone outside the Park, they might have left their core habitats because of the increase in tourist flow, invasive nomadic grazing in the core habitats and consequent increase in disturbance. The original habitat of Deosai, being fragmented now, may also have forced certain animals to move out of the Park. Although more information may be available after, a thorough research,

which may take years from now, certain arrangements have to be agreed with the park communities, hosting such habitats, for the protection of Bears and their associated biodiversity, found around. However, the community may agree to this provided they get some benefits from the Park. Accordingly, the future security of the Park's Bears would depend upon two things; identification of their habitats especially the hibernation sites of the Bear outside the Park, and social mobilization of the concerned communities to accept Bears and take responsibility for their protection.

1.2. Conflicting Issues

Conflicts are neither bad for the park nor uncommon in the parks. However, their benefits or damages lie in the ways and approaches that are adopted to manage these. Resolution of certain conflicts are next to impossible since these persist and re-emerge in a different, sometimes in rather more serious forms, later in the history of the park. Management of conflicts rather than trying to resolve these, seems to be a safer way under various conditions and circumstances in Pakistan.

Basic reasons for several of the conflicts in our parks are primarily because of the ways that are adopted to establish a park. Since the history of parks in Pakistan is not very old, the earliest being established is 1974-75, while the history of the uses of the natural resources of the park by the local community dates back to hundreds of years. This fact alone clarifies the reasons behind the conflicts.

National Parks are normally decreed on land/water that is in the Government ownership either with no human uses inside or such uses being compensated before the boundaries of the park are drawn. Establishment of most of the protected areas in Pakistan was done differently.

The people were/are already there with their traditional rights and concessions of uses of the resources over the land that later becomes the part of the Park. Accordingly, the decision of declaring a particular area as Park is strongly resisted by people who have already been using it since long and, particularly if they have no alternate options such as grazing land, water for irrigation, land to grow grains, vegetables etc. or land wherefrom wild vegetables, fruits or medicinal plants are collected for commercial purposes. Resistance to such decisions normally grow big and often challenged in the court of law. The negative impacts of such conflicts become evident in the form of ruthless hunting of the animals that are the targets of protection in a park or the destruction of habitats of various plants and animal species.

There may be dozens of other reasons behind the conflicts in the park, the classic reasons for conflicts in the DNP are as under:

1. Grazing of Livestock in the critical habitats of a park that may result in the reduction of food for wild herbivores, cause spread of diseases, result in direct killing of wild animals or create disturbance
2. Construction of roads, buildings, rest houses, shops etc. that cause fragmentation of habitats of the park wildlife species and subsequent dispersal to unsafe areas outside of core zone, done either in an unplanned manner by the custodian department or by another department with different mandate for different purposes such as sports and

recreation, exercises of different forms, use as passage for livestock, transportation of materials etc.

3. Dual management authority where the authority of land uses inside the park is vested with more than one department/institution or where the management of the park is freely violated without any fear of being questioned by another institution for something that is not related with conservation of the park resources or sustainable development of the adjoining community.
4. The distribution of the Park revenue, generated through entry fee or other means for distribution among different groups of beneficiaries.
5. Boundary demarcation of the park through fencing, boundary pillars or other means in accordance with the legal notification of the park, that is objected or denied by the people who have some kind of interest such as illegal grazing, fishing, collection of medicinal plants or fuelwood etc. within the boundaries of the park
6. Diversion and use of the water resources for other purposes, generated within the park and which provide habitats to aquatic fauna or provide various necessities of life to some of the park's Biodiversity.
7. Inter-communal conflicts over the grazing rights or traditional use of any part of the park land
8. Dispersal of park animals to the adjoining areas outside of core zone, posing threats or potentially dangerous for the life and property of local community and thus often killed in retaliation by the community
9. Insufficient economic/social incentives for neighboring community to compensate for their loss of the traditional rights of uses thus resulting, off and on, in the creation of problems for the management staff

Regarding specific conflicting issues in the park, the planning team could identify the following:

Broadly DNP is facing three-fold management challenge:

a. biological challenge to conserve the small brown bear population,
b. a resource management challenge to balance the needs of people and stakeholders without compromising on the ecological integrity
c. Sociopolitical challenge to build confidence of the local communities by engaging them into the conservation and park management processes

Specific conflicting issues

1. The establishment of Deosai National Park in 1993 led to conflicts that affected livelihoods of indigenous communities who were dependent on the Deosai plains. Conventional conservation approaches advocate that indigenous communities should be excluded from using Protected Areas (Robbins, 2004:148). DNP was created under the Northern Areas Wildlife Preservation Act of 1975, which bars populations from accessing Protected Areas and Parks (Nawaz, 2008:19). This is highly discriminatory since communities were deprived of their land to which they held access and property rights for centuries

2. Access of Bakarwals and indigenous communities to the Park was restricted since 1993. This was in spite of the fact that Bakarwals have historically retained access to Deosai.
3. Livestock traders and army contractors use DNP while travelling to Skardu or Baltistan. They start their travel on foot along with their animals from Astore or Gultari which are usually sold to the meat market of Skardu or to military, during their travel they usually stay for couple of nights in the park and their livestock moves freely grazing everywhere. The recent surveys of Ev-K2-CNR reveals that approximately 80000 to 100000 animals are transferred through DNP putting a lot of pressure on fragile ecosystem of DNP.
4. Due to important strategic position of DNP, Pakistan Army keeps several check posts outside the park and one camp inside the park near Ali Malik Top. Sometimes requests received at Parks and Wildlife department from military for permission to carry out non-combat exercises inside the park. there is no evidence of illegal hunt or offence by these forces inside the park yet following their own notions may interfere in the park affairs in and outside the park boundaries. For instance, they may allow some grazers, or stop others in certain areas, due to which local grazers may feel more subject to forces then to park authorities. Consequently, park rules and administration may relegate to a secondary position or no position at all. Similarly, while they are powerful in terms of legal authority, park watchers dare not to check a Forces vehicle on the park barrier even if they are sure of the presence of a trophy or wildlife carcass in it. Due to this and several other reasons, forces enjoy greater authority than the park administration would do. It was also learned that army post near Ali Malik Top throws out all trash and eatables just outside of their fence and bears usually feed on it that should also be stopped.
5. GB Public Works department has planned to construct several connectivity roads through DNP to provide links to the border villages of Skardu and Astore. Pakistan Air Force had planned to build an airbase in Deosai. Recently, a new inter district connectivity road has been passed through Deosai to link Astore with Skardu. Most of these roads and other infrastructures though provide linkage, connectivity and strategic services to far off border villages and forces but simultaneously, bifurcate the core and home range habitats of the endangered Brown bear and other associated wildlife species of the park, affecting their ecology, behavior and food availability at large.
6. Diversion of Shatung river is also on cards due to dire need of water for power generation and irrigation in Skardu and on the other hand the communities of District Astore expressed their serious concerns over this planned project in consultative sessions.
7. There are serious conflicts over campsites management between the custodian communities and the department. Department desires to establish standard accommodations and camp site management with involvement of diverse enterprise group at regional, national and international level but the community wants their involvement at every level.
8. Participation of the community in park management and conservation
9. Administrative issues: No presence of any responsible official in Chillum office
10. Grazing fee being collected by Astore Forest Division

11. Conflicts over DNP boundary
12. Revenue sharing and mechanism

1.3. Rules and Regulations

National Parks in Pakistan, including Gilgit-Baltistan are notified and administered under the Wildlife Protection Rules 1974-75.

Although ideal in theory to provide needful protection to rare and endangered animal species and flora of the park, these are extremely difficult to implement. This is primarily because of an effort to implement such rules that give rise to no-ending conflicts in the park that run-in generations and never allow a park to achieve its conservation objective.

DNP is expected to have a management committee the plan recommends the committee to examine in depth a couple of issues and advise accordingly. The plan has identified such issues with tentative solutions but feels that these should be finally decided by the management committee for adoption by the department. A double check on these shall protect against any fault in implementation that shall be hard to repair if not decided more carefully. These are as under:

1. Ev-K2-CNR, while developing an operational plan for CKNP and realizing the difficulties in implementing the established National Park's rules for management though not in a position to change or amend the park's rules, had suggested to dig out the various customary practices that are best to ensure conservation of park resources, assess for their suitability as replacement of the rules of 1974-75 in specific cases and adopt in cases where the implementation of conventional rules is difficult or that give rise to conflicts which in turn causes more damages to the park resources. The process though incomplete yet, could be equally beneficial for the management of some of the resources of DNP. Since this is beyond the scope of the current plan, the custodian department may explore its feasibility under a Government notification or through the decision of the proposed management committee and adopt.
2. Similarly, the livestock damages by the predators, and consequently the retaliatory killings of predators are chronic issue in many parks, DNP being no exception. Since different models are adopted in different places, from cash compensation to community insurance schemes, the final decision may come from the proposed management committee or other such body. EvK2CNR shall share its experience on the matter gained from other areas.
3. Ownership/traditional rights and concession of uses over the park resources has been a source of tension between various communities of the park. The planning team had serious limitations in reaching a decision on sharing of benefits among different groups without the revenue record and history of uses. That needs the attention and help of the custodian community to manage this conflict
4. A similar conflict exists on the re-channeling of certain water channels of the park. The plan suggests its tackling by a more appropriate authority
5. The parks can more conveniently exist if the benefits are mutual; park is supported by people while people get benefits in the form of some kind of income, social development etc. The plan has suggested certain measures but the decision shall need

the resolution of existing conflicts over the ownerships and traditional rights of uses. This issue may also be examined by a body, specifically notified for this purpose and its recommendations considered for implementation.

Having indicated the above, there are certain rules that must not allow any relaxation in case of DNP and which do not need a plan prescription and have to be implemented as such unless modified/altered by the existing legislation, such as:

1. Protection of wildlife species against direct and indirect killing and safeguarding their territories and home ranges against any form of disturbance especially the bear sites, inside and outside the core zone of the park
2. Pollution of air, soil and water through any means.
3. Grazing of livestock in the prohibited areas
4. Disturbance in the form of roaming in strictly protected sites, making noise, conducting activities that may make the wild animal leave their abodes or spoil the peaceful impression of an ecological site in the form of recreational uses, exercises etc.
5. Fragmentation of the existing habitats through building roads or developing infra structure that divide the natural habitats, restricting its use by the park animals or destroy its natural looks
6. Restrictions on uncontrolled roaming of visitors, threatening the ecology or culture of the park

1.4. Legal Issues

DNP was established over an area of 3626 Km^2 on December 4, 1993 but the notified area was overestimated at that time compare to the area given in last approved MP that includes 1982 Km^2 and with updated GIS and ground verification the revised MP delineates an area of 1621.66 Km^2 as described in the chapter 8 of this document.

Moreover, Deosai was declared in 1993 as IUCN Category I Protected Area (Wilderness Park). Where grazing, illegal hunting, construction and other forms of resource extraction were completely prohibited by the law, but in the last approved MP (2016) and in this revised version (2020), the DNP has been declared as IUCN category II in which sustainable livelihood activities for local communities and presence of visitors are possible.

1.5. Legal Framework

The establishment of parks on traditional lands has a varying impact on indigenous peoples' lives. Indigenous values and customary practices communities to use all areas and resources while at the same time protecting them. These customary values and practices are borne out of generations of experience. They are the knowledge accumulated as the result of trial and error processes, and are embedded in customary laws and practices passed on to the next generation by the socialization process and through teachings beginning at a young age. Customary practices often transcend into spiritual beliefs, and have laws in place to regulate them. Respect for customary laws, or appropriate new protocols concluded and implemented by chosen representatives of indigenous institutions, communities, and peoples must be promoted and incorporated within national frameworks governing national parks.

Existing Customary Laws and Application to Management of Natural Resources

United Nations in its Universal Declaration (Agenda 21: Chapter 26) titled "Recognizing and Strengthening the Role of Indigenous People and their Communities" has called on Governments to recognize that the lands of indigenous people and their communities should be protected from activities that the indigenous people consider to be socially and culturally inappropriate through adoption or strengthening of appropriate policies and /or legal instruments at the national level (or intergovernmental organizations). Government of Pakistan being a signatory to this declaration has the moral responsibility to harmonize the customary laws (and rights of indigenous people) to evolve indigenous people friendly rules.

This is often being advocated that the customary laws/practices, being adopted since long times by the local communities for the management of their resources in light of their sustained livelihoods, are reasonable alternatives to statuary laws for the protection of natural resources. It is further advocated that if such customary laws/practices are equally effective in protecting park resources, these may also be useful in promoting the management of a National Park.

In order to see if there is anything good in the existing customary laws/practices and if these are effective enough to be wholly or partially accepted as substitute for the statuary laws and park rules of DNP, these were reviewed. These were further assessed to see their impacts on the conservation of natural resources and park's biodiversity. The findings are given in the following section:

Customary Laws in Gilgit Baltistan and in DNP Area

Customary laws, established by communal practice and usage for generations and passed down through oral tradition, are familiar, effective and continue to be practiced to a greater or lesser extent throughout the Gilgit and Baltistan. And yet few of them have been documented so far.

There are many opportunities for reforming statutory laws governing natural resources in Gilgit and Baltistan to converge with elements of customary law, thus adding greater legitimacy and efficacy to the state's efforts towards conservation of natural resources in the region. The history of Gilgit and Baltistan and discussions with researchers and resource persons born and raised in GB indicate that Gilgit and Baltistan even today can be described according to the political and legal systems that were in existence prior to Independence.

Certain areas had been ruled by local Rajas since ancient times; in some parts of Gilgit and Baltistan, the law of the Rajas survived till as late as 1972. Other areas had been settled by the British in the 1800s and were under British law. Certain historically tribal republics remain as such after their conditional accession to Pakistan. Due to these historic differences, the universe of the research was divided into three domains that correspond to the politico-legal systems:

a. Rajgiri Areas: Punial, Ishkoman, Gupis, Yasin, Hunza, Nagar

b. Settled Areas: Astore, Chilas, Gilgit, Godai/Bubin, Khaplu/Karmang/Shigar and Rondu

c. Tribal Areas: Darel, Tangir

The three domains would ensure that any possible variations in the customary laws regarding natural resources in Gilgit and Baltistan could be encompassed and that research findings would fairly represent the reality of the universe (Russell, 1994). The customary legal system in Gilgit and Baltistan is structured around the principles of shared space and shared blood relations. In each of the three areas – Rajgiri, Settled and Tribal – different combinations and permutations of these two principles underlie the management and use of natural resources. The customary regulatory system is based on collective responsibility that in most cases aims at using natural resources in a sustainable manner.

This collective responsibility is built into the structure of the customary regulatory institutions, which are similar in all three areas, although there are local variations on specific powers and duties. Members of the communities select the functionaries of these institutions and compensate them; therefore, all members of a community have a stake in their performance. People listen to the customary authorities because they are members of the community, rather than outsiders.

These results suggest that there would be relatively little difficulty in harmonizing customary and statutory law at the operational level. Introducing the concept of collective property rights into the current statutory system would be more complicated, but feasible through consultation and consensus building. Harmonization in the sense of equity would undoubtedly be the most difficult issue to resolve, given longstanding stakes in the benefits of natural resource exploitation.

"Harmonization" in the sense does not mean diluting customary law, incorporating it into statutory law and expecting that it would then disappear. Rather, it means understanding and respecting customary laws as a sophisticated and dynamic legal system, with at least as long a regulatory history as statutory law if not longer, and which already reformed itself to incorporate elements of the statutory law.

Long-term, effective regulation of natural resources in Gilgit and Baltistan will require reciprocal recognition of customary laws and corresponding reform to incorporate many elements of it into statutory law. The implications for sovereignty have been addressed and resolved in countries that have already taken steps to recognize and provide for the survival of the customary legal traditions practiced in their territories.

International agreements and processes are placing increasing emphasis on recognition of indigenous property rights and equitable sharing of benefits. Pakistan is already a party to many of these agreements and is an active participant in global processes. The country has an excellent opportunity to contribute to these processes by taking the results of this study to the next phase of ground-breaking work on the nexus between customary and statutory law for natural resource conservation – substantive legal reform that promotes sustainable livelihoods for natural resource-dependent communities in Gilgit and Baltistan.

All of the National Parks of GB, including DNP, have been created under the Northern Areas Wildlife Preservation Act 1975. Certain acts are mentioned in the Act inside a National Park. Working in the Park and interaction with the communities reveal that certain rule which are prohibited in a National Park is in conflict with the traditional use right of the user communities.

In order to ensure that provisions in law which may not result in the violation of rules at the cost of conservation of the natural resources of the national parks, there is provision for the relevant Government authority to relax such rules to address the possible conflicting situation in a more realistic manner.

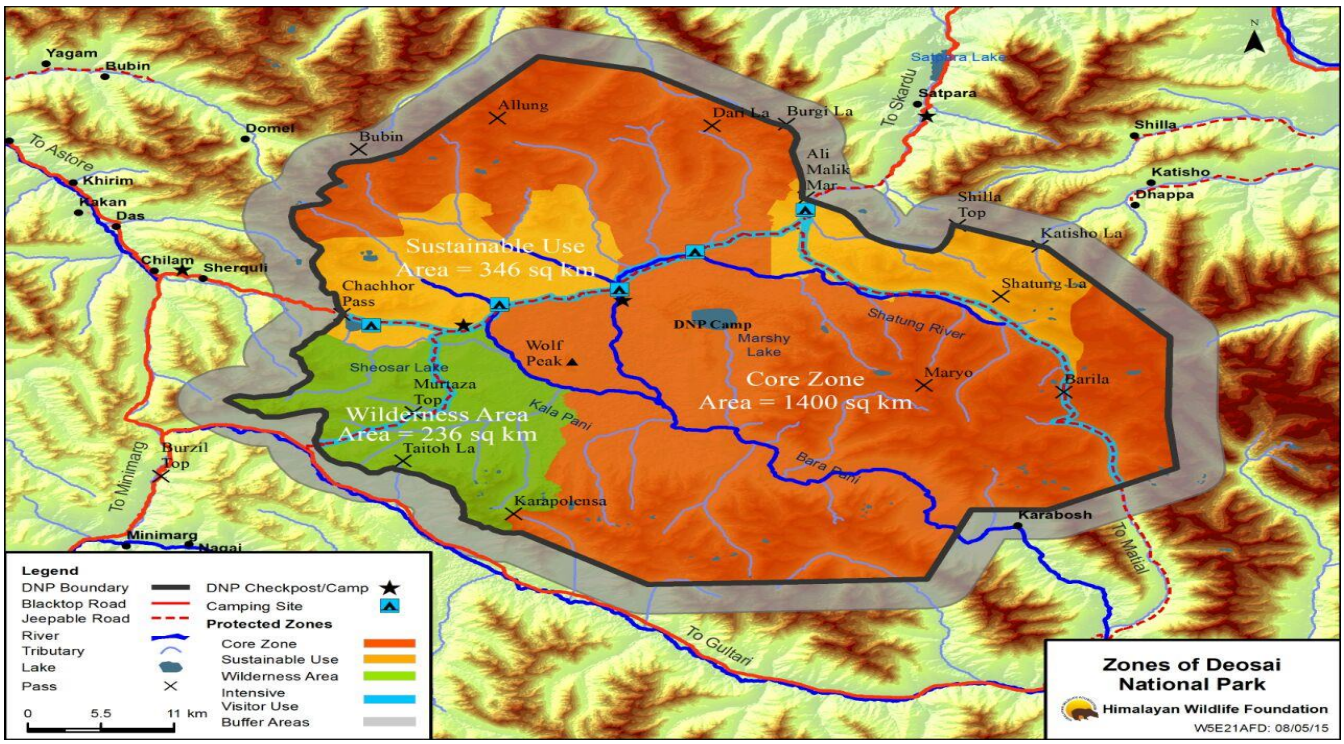
2. BOUNDARIES DELINEATION AND ZONING

The Park boundaries has been revised on the basis of:

- The geographic data GIS
- The watersheds
- The GPS APP
- The existing boundary pillars that had been pointed in the map with GPS data

The new data is that the surface of the park is: 1621.66 Km^2. The Park was established over an area of 3626 Km^2 area on December 4, 1993: surface that results overestimated compare to the last MP approved that indicates a surface of 1982 Km^2.

Exhibit 1: Previous map of DNP



Core zone: 1400 km^2

Wilderness Area: 236 km^2

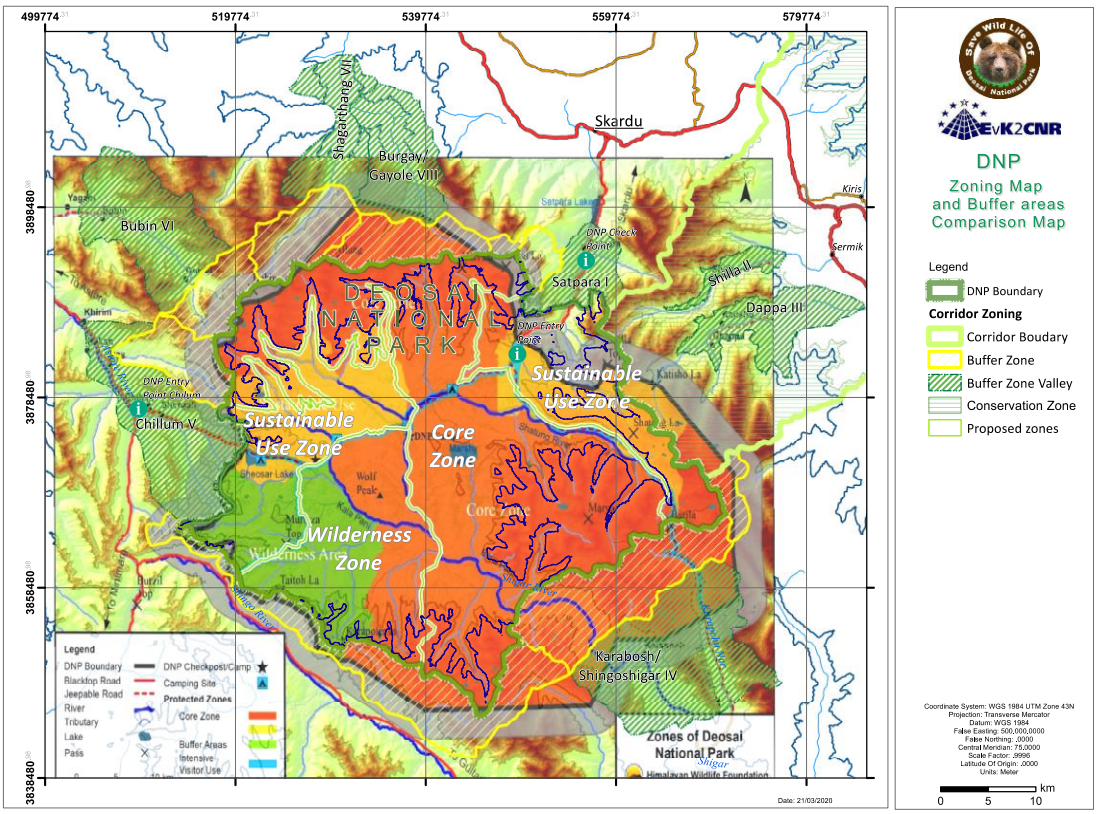
Sustainable Use Area: 346 km^2

TOTAL: 1982 Km^2

In this Management Plan the boundaries has been delineated with more accuracy and the surface of the Park is 1621.66, 360.34 Km^2 less, but if we include the Buffer Zone and the Buffer Zone Valleys the total surface is 3000.7 Km^2, almost the same of the proposed surface declared in 1993 at the first declaration of DNP National Park.

The difference between the surface of this map and the surface that is delineated in this plan is mainly concentrated in the SE side of the Park where it was not designed on the boundary pillars of Bari-La, but more down in the valleys. The map above is not correct also in the watersheds border especially on the N side, that delimitate the Deosai plateau and has been corrected on the basis of the GIS data, the survey of our and DNP staff, starting from the existing pillars. In these differences, there is the difference in the Core Zone area that is virtually reduced, but it is partially more extended than before or covered with a strict Buffer Zone.

Exhibit 2: DNP zoning and buffer areas comparison map



In this map is delineated the previous border with the new one in green line that is on the Deosai watershed line; the map of the approved MP is without a clear geographic concept and has been re-delineated

Internal zoning limits differences

The criteria for the delineation of these new limits are:

- Brown bear distribution including the information of the census of previous years and the last one in 2019
- Altitude contour line of 4300 m. that represent the forest limit derived from the land cover map
- Roads and rivers
- Exclusion of visitor presence inside the Core zone (except the main road cross)

The Sustainable Use Zone remains almost the same, with some modifications with Wilderness Zone that is partially transferred to east reaching the road that take to the Bear Watching Point.

Buffer zone limits

The Buffer zone boundaries are not a circle around the Park as before but its width is different in different valleys and these differences depend to:

- Brown bear distribution outside of the Park, including the areas where it is present
- Land cover
- Watershed and altitude
- Valleys and villages

This plan arrives to a clear delineation of the boundaries of the Park and include two more zones to protect the fragile ecosystem:

- Buffer Zone
- Buffer Zone valleys

To ensure conservation and sustainability in use of the national park, a zoning exercise was carried out to designate clearly defined management zones, each with a set of management principles and rules.

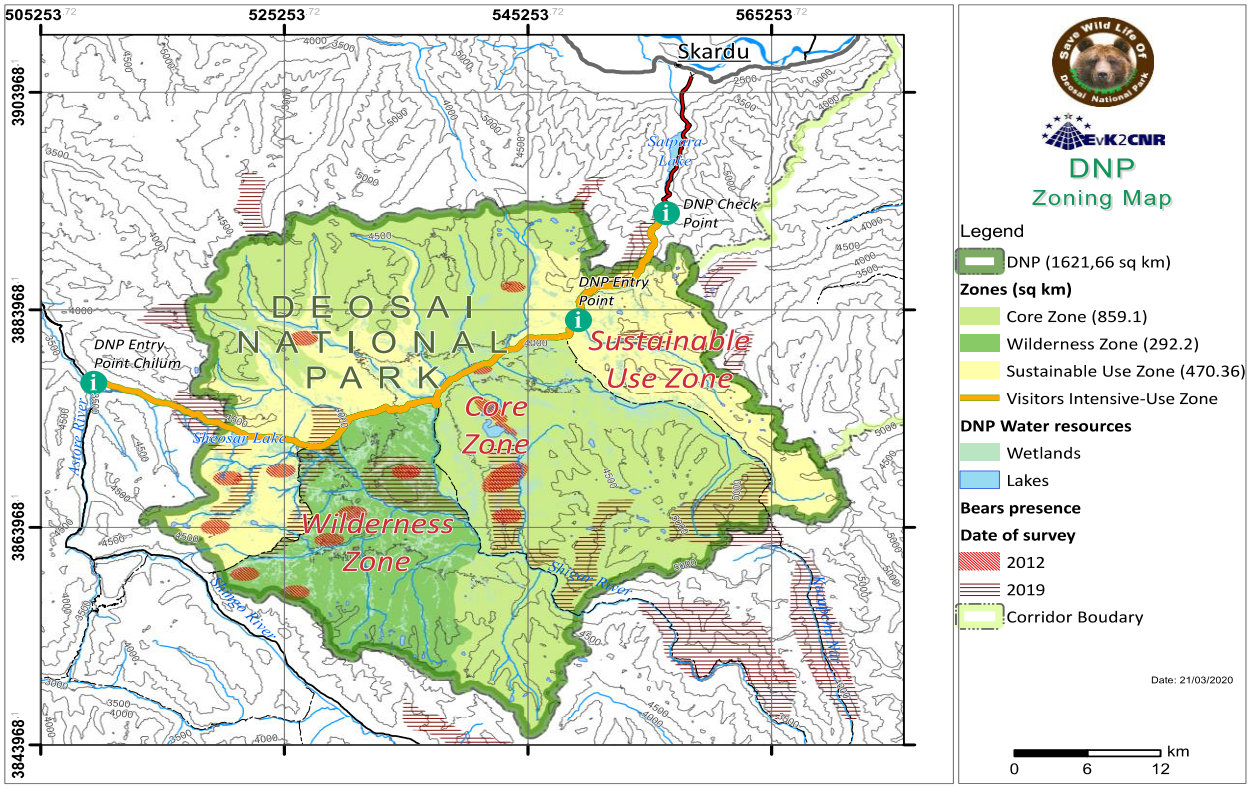
The exercise is based on the following GIS-based information on environmental values and existing uses in the DNP. The new land cover in very detailed scale allowed us to recognize the changes in the last years. The analysis of the modification of the relevant data in the last 5 years give us good information and allows us to achieve a precise zoning drawn from:

- Areas with suitable bear habitat
- Areas of wet lands
- Watershed and contour lines
- Areas encompassing other important habitats such as marshes, streams and waterways.
- Areas of intensive use by visitors such as 'camping areas', 'roads', etc.
- Areas designated as for enhanced ecotourism activities, such as 'recreational fishing', etc.
- Areas used traditionally by Gujjar Bakarwals.
- Areas used traditionally by communities.

Bear habitat suitability map from the studies[1], Show the area where the protection is more necessary.

[1] Nawaz M A, Martin J, Swenson J E, 2013, Identifying Key Habitats to Conserve the Threatened Brown Bear in the Himalaya, Biological Conservation 170 (2014) 198–206.

The new maps that are designed for the new zoning system are annexed to this document and described in the next paraphrasers.



Proposed management zones and management principles

The zoning exercise conducted for DNP aimed to balance use and conservation, keeping conservation as a priority; however, without compromising the sustainable use of the Park. The use includes that allowed under the legislation, namely recreation and education, and traditional rights of the local communities and the Gujjar-Bakarwals that are dependent on the DNP.

The Deosai National Park is designated as “National Park” under the wildlife legislation. However, to allow for development of tailored management principles for different areas

within the DNP designated zones, their purpose, and broad management guidelines are described in this chapter: there are four different zones inside the Park Boundaries and two zones outside the park in a comprehensive Buffer Zone.

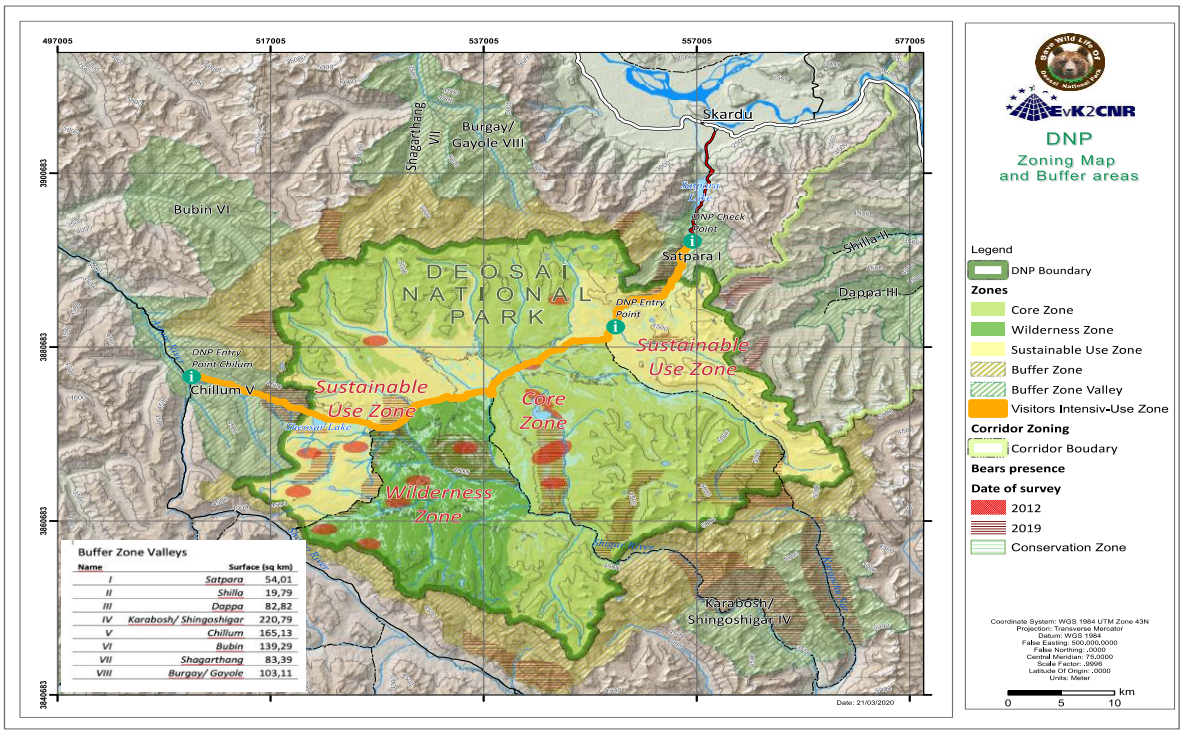
- **Core Zone**
- **Wilderness Zone**
- **Sustainable Use Zone**
- **Visitors Intensive-Use Zone**

Outside the Park boundaries:

- **Buffer Zone**
- **Buffer Zone Valleys**

DNP			
Core Zone	Sustainable Use Zone	Wilderness Zone	Total DNP
859.1	470.36	292.2	**1621.66**
Buffer Zone	BZ Valleys		
613.39	765.69		**1379.08**
Total surface protected 3000.7 km^2			

Exhibit 3: DNP new zoning and buffer area map



2.1. Core Zone (CZ)

The purpose of this zone is to ensure conservation of the Brown Bear, which is the apex species in the national park, and to protect the most part of the Wetlands that assure the habitat for the Brown Bear itself and of the entire ecosystem.

The criteria for the delineation of this zone are:

- Brown bear distribution including the information of the census of previous years and the last one in 2019
- Altitude contour line of 4300 mt. that represents the forest limit derived from the land cover map
- Wetlands surface derived from the land cover map
- Maximization of the area where it is not allowed the livestock grazing

The following broad guidelines apply in this zone:

- Strict protection of all biodiversity, habitats.
- Strict enforcement of fines for violations
- Strict limitations on entry through permit from the Park authorities and accompanied by park staff.
- No extraction of any kind permitted
- No off track driving
- No construction allowed.
- It is not allowed to build new roads and asphalt those existing
- Jeep Safari strictly not allowed
- Strict protection of all biodiversity, habitats.

2.2. Wilderness Zone (WZ)

The purpose of this zone is to ensure protection retaining their natural character; the human and livestock presence is reduced to a minimum level only for the survival of the Nomads millenarian tradition. In the future, if the Nomads are going to reduce their presence in the Park this Zone could partially become a Core zone extending the strictly protected area.

The criteria for the delineation of this zone are:

- Brown bear distribution including the information of the census of previous years and the last one in 2019
- The land cover map that show the grass availability
- The contour line of 4300 m and the physical boundaries (rivers, mountain ridges and watersheds)
- Altitude contour line of 4300 m. that represent the forest limit derived from the land cover map
- area where it is allowed the livestock grazing for the customary practice of the Nomads (with some restriction and strict control of the Park staff)
- The use right customary laws for the communities
- Flora and fauna distribution and protection

2.3. Sustainable Use Zone (SUZ)

The purpose of this zone is to ensure protection retaining their natural character; the human and livestock presence is permitted only for local communities. Occasional visitors reduced to a minimum level, and can move only along designed trails, or with a special permit.

The criteria for the delineation of this zone are:

- Brown bear distribution including the information of the census of previous years and the last one in 2019
- Altitude contour line of 4300 m. that represent the forest limit derived from the land cover map and the physical boundaries (rivers, mountain ridges and watersheds
- The land cover map that show the grass availability area where it is allowed the livestock grazing for the customary practice of the Nomads and local communities that has use rights (with some restriction and strict control of the Park staff) (see map below)
- Flora and fauna distribution and protection

2.4. Visitor Intensive Use Zone (VIUZ)

The Visitors Intensive-Use Zone, will be restricted to camping sites, camping hostels, fishing areas, and an area extending to 100 meters on each side of the main road that cross the Park, which will be demarcated as such through the length of the traffic corridors.

2.5. Buffer Zone (BZ)

The proposed Buffer Zone is supporting a harmonic interaction between nature conservation and the use of the natural renewable resources through a sustainable way. This promotes the conservation of landscapes, traditional forms of land use, together with social and cultural features.

This area, outside the DNP's border and spreading for about **613.39 km^2**, is not continuous around the whole Park, but it is present mainly near the Core Zone and near to the areas where there are unsustainable activities and therefore a transition zone is needed.

The frequent sighting of Brown Bears especially during the winter period in an outdoor area at the edge of the park has led to the definition and delimitation of the Buffer Zone which is no longer a simple circular crown around the Park but rather an area defined by linking Brown Bear sightings, the orography and the plant cover.

This area that functions as a buffer around the park requires a careful management also because it could become in the future an extension of the Park itself.

2.6. Buffer Zone Valleys (BZVs)

In the revised zonation of DNP, Buffer Zone Valleys have been included as a new zone in MP that include the villages that have use right inside the park. In 2018/19 Ev-K2-CNR in collaboration with WLMO/DFO-DNP organized several consultative sessions and meetings with LSOs, VCCs and VOs during the last years have been organized several meetings with the communities and VO to analyze the emerging threats to natural resources and specially under climate change situation and its impacts to the lives of local inhabitants.

3. FEES MECHANISM

3.1. Fees

The Fee System is divided in three levels:

- Foreign Visitors
- National Visitors
- GB resident Visitors

The local communities' inhabitants have free entrance in the Park. Currently to enter and stay it is sufficient to register at the Park entry points and pay the Entry Fee (8 USD (1300 PKR) for foreigner and 100 PKR for nationals, 40 PKR for GB). With the last year visitors, the amount collected is around 4.79 million PKR.

The management plan strongly suggests to revise the current Park fee structure and proposes 20 USD for foreigners, 500 PKR for nationals, 100 PKR for GB inhabitants and no fee for buffer zone communities. Moreover, the plan also suggests the grazing fee paid by nomads is being collected by Astore forest division which must be collected by DNP Directorate and also proposes following revisions in the grazing fee structure:

- Goats/Sheep: 50 PKR/-
- Mules/ Horses: 100 PKR/-
- Angling fee: 1000 PKR. /- per permit
- Campsite fee per person per night for local/ national= 300 PKR/-
  Foreigner= 10 US $

Put together:

- Entry Fee
- Grazing Fee
- Fishing Fee

These funds have to be transferred to DNP Directorate for the coverage of its expenses and mainly for waste management (25%), and 75% of community share against the submission of valley conservation and sustainable development plans or the local communities shall discuss the division of the 75% amount with the competent authorities for an acceptable agreement. It is mandatory that the social organizations do exist in the valleys and are registered with relevant departments

3.2. Revenue Distribution

Proposed procedures for the distribution of Park revenue among custodian community for saving park and its resources

The generation of funds, its judicial distribution and positive uses is one of the most complicated, challenging and conflicting issues in the management of the park. The parks being created at the expense of community's rights of uses and concessions for grazing their animals, collection of fuelwoods etc. such communities need to be given certain incentives that may

keep them satisfied for them to extend all possible cooperation to protect the park resources from possible degradation and damages etc.

In the past, a major chunk of the revenue generated through trophy hunting was and is being given to the community who are protecting the game animals from illicit hunting. The community of Khunjerab National Park are being paid money from the fee levied on visitors for entering national park. In case of Deosai National Park, entry fee has been levied in 1999 that is being collected at two entry points, however, neither the magnitude of the money is big enough to keep everyone happy nor there has been a set procedure for its distribution which is acceptable to all.

The revised management plan proposes the following:

3.2.1. Generation of revenue

Park entry fee, grazing fee, and angling fee are the current sources of revenue but keeping the number of dependent people, this amount is extremely low. Accordingly, it is prescribed to enhance the current amount by at least 100% for the next 3 years that may further be enhanced for the future then, if needed.

Same should apply to grazing and angling fee.

In addition to the above, the GB government may establish an endowment fund for the park that must be fed through the GB resources, added by NGOs that are working in GB. Interest from this fund may only be added to the Park revenue. Other sources such as donations etc. may also be explored to add to the park revenue.

3.2.2. Identification of the recipients

This is again a tricky business and the park management may need advises from the wiser in the community. Tentatively, the following could be the potential recipients:

The people who have surrendered their traditional rights within the core zone of the National park

The community who are hosting Brown bears for any stage in their life cycle and are protecting them from retaliatory killings and other threats

The community who volunteers and are selected by the park management to be providing services to tourists as guides and facilitators

Based on the above criteria, the following villages have been identified:

- *Name of the valleys:* Satpara, Karabosh/ Shingo Shigar, Shilla, Dappa, Shagarthang, Burgay, Chillum, Bubin
- *Number of households:* 1341
- *Total population:* 12284

3.2.3. Distribution of revenue

The general principle for the distribution of revenue shall be the same as applied to revenue from trophy hunting i.e., 80:20 with 80 for the community and 20 for the management. Having said so, the plan strongly recommends a watch over the expenditure of the money which though

is prescribed for the beneficiary community of trophy hunting as well but never observed so. Accordingly, it is strongly suggested to observe the following principles:

Payments shall only be done to a registered social organization under an MoU, framed only for a particular purpose

Whatever amount is given to a community for their services, must be given against a "conservation and development plan", approved before hand by the Park Management. 30% of the money given to the social organization is for conservation which must clearly be reflected in the approved community conservation and development plan. This money may go to the watch and ward system, develop by the community, improvement of habitats, control of livestock diseases etc.

The development money must not be spent on things like the purchase/use of pesticides and other harmful practices. The plan, that contains abusive uses of the money should not be approved

The community who gets benefits of grazing fee should not allow the unvaccinated/diseased livestock in the park and must report if there are diseased/infected animals in the herds, being taken to the park. Moreover, they may also see if the nomads carry something to the park which may be harmful/disturbing for the wildlife or habitats in the park and may not allow something out of the park in extracted or killed/stuffed form.

3.2.4. Precautions

The money given to beneficiaries out of the park revenue must not be taken as a free commodity, rather it must be linked to some kind of services essential for the park and its wildlife. Having said this, we may have to identify first the nature of expenditures which is in the high interest of the park resources, wildlife and its habitat, followed by the expenditures that shall generate more revenue for the park. According to this criteria that may be further refined, the priority must go to communities that have surrendered their rights of grazing in the park, followed by that community which protect Bears, fish and other wildlife species of the park as well as vegetation and waters of the park, followed by interventions of the community that help in the regularization and promotion of ecotourism.

4. OPERATIONAL PLAN

4.1. Institutional Setup

Currently the Park Directorate is located at Skardu and a check post/ rest house have been established at Chillum in Astore. The Wildlife Management Officer (PBS 18) looks after the park affairs with a meager proportion of human and material capital. Only 31 Game Watchers and Chowkidars, supervised by a Range Forest officer (BPS 14) are entrusted to take care of 3000.7 sq. km area in the most tough, rough and remote valleys. Out of the total, only 12 staffs are regular employees, whereas, rests of the 19 are hired on contingency basis. There is a position of the Park Director (PBS 19) but is lying vacant for the last many years. Field staff appointed to protect wildlife during harsh winters has no adequate uniform, equipment and high-altitude winterized shelters. Gilgit-Baltistan Health Department has established a First Aid Post at Bara Pani for the summer season only. But still a lot is needed to be done. Due to inadequate capital, lack of equipment and insufficient field support, the Park resources are difficult to manage, and if adequate protection is not provided, the precious resource may become extinct from the Park.

As per notification, DNP falls mainly in the jurisdiction of Skardu district. Its southern and western boundaries just touch the administrative boundaries of Astore in Chillim, Bobin, and Mir Malik Pass. But contrarily, the communities from both sides equally claim inherent resource use rights inside the park as well as in its buffer zone, and hence demand for equal distribution of benefits in terms of employment opportunities, share in sustainable resource use, Park entry fee and other anticipated benefits from the Park.

These administrative and management issues can be resolved by establishing and strengthening the existing Park directorate and making it accountable for the needful care and conservation of Park and its resources, with the help of following policy interventions:

- The vacant position of Park Director and required supervisory as well as field protective staffs should be hired and placed in appropriate offices on emergent basis.
- Capacities of the protective field staffs improved in biodiversity monitoring, wildlife management techniques from Pakistan Forest Institute (PFI), Wildlife Institute of India (WII), other relevant national and international biodiversity conservation, and management institutes.
- Financial resource and capacity of the Park Directorate should be amplified manifolds, and mechanisms developed for equitable sharing of benefits amongst traditional Park users in recognition of their conservation efforts and active role in management of Park resources.
- Park infrastructure including park offices, educational and recreational facilities, should be appropriately established on both sides of the park. Since the Park Directorate is at Skardu, so office of the Wildlife Management Officer (WLMO) should be established at Chillum in Astore district, while considering social and ecological sensitivities of the Park. Otherwise, a regular RFO (BPS-16) must be positioned at Chillum office and WLMO at main office in Skardu.

The detail Institutional Development Plan for DNP (2015), Financial Management Plan for DNP (2015), Infrastructure Development Plan (2015) developed by HWF were part of the approved management plan of 2016 as the approved management plan of the 2016 was not implemented so these documents are still valid and are annexed with this management plan as well.

4.2. Park Management Structure

4.2.1. Governance for the management of the DNP

Desirable management of DNP shall require the presence and availability of major stakeholders on relevant committees to discuss the issues that are both conflicting and damaging to ecological health of the park, or interventions that may be essential to undertake to maintain in DNP close to natural state, if not completely natural. Various organizations such as DNP Directorate and Evk2CNR have been working on the structures and functions of such committees and have recommended these to be useful for the management of the DNP. Accordingly, the management plan thus prescribes as under:

4.2.1.1. DNP sub-committee

Proposed Functions

- Discuss and provide guide on policy and legal issues related to maintaining ecological health of the DNP as represented of the Himalayan landscape with natural features and elements of global significance.
- Address trophy hunting issues that are to be decided by wildlife management board
- Undertake/ endorse decisions of DNP management committee related to promotion of tourism or facilitation of tourists
- Decide upon any conflicting issue and suggest solutions
- Guide on the generation of additional financial resources for the promotion of conservation and sustainable development. The committee may guide on the sustainable marketing of local resources, especially medicinal plants from places that do not affect negatively the ecology of the area
- Decide on fixing a percentage to be charged to miners that shall ultimately be spent on improving the health of the national park resources.
- The committee shall meet at least twice a year.

Propose Structure

- Chaired by secretary Forest, Wildlife & Environment, CCF, Conservator Parks, Wildlife, and Director/ WLMO of DNP (as member secretary).
- Other members include provincial secretaries such as agriculture & livestock, tourism, minerals, provincial/national & international NGOs/ Universities based in GB with mandate in DNP and one community members from each DCC.

4.2.1.2. DNP Management Committee

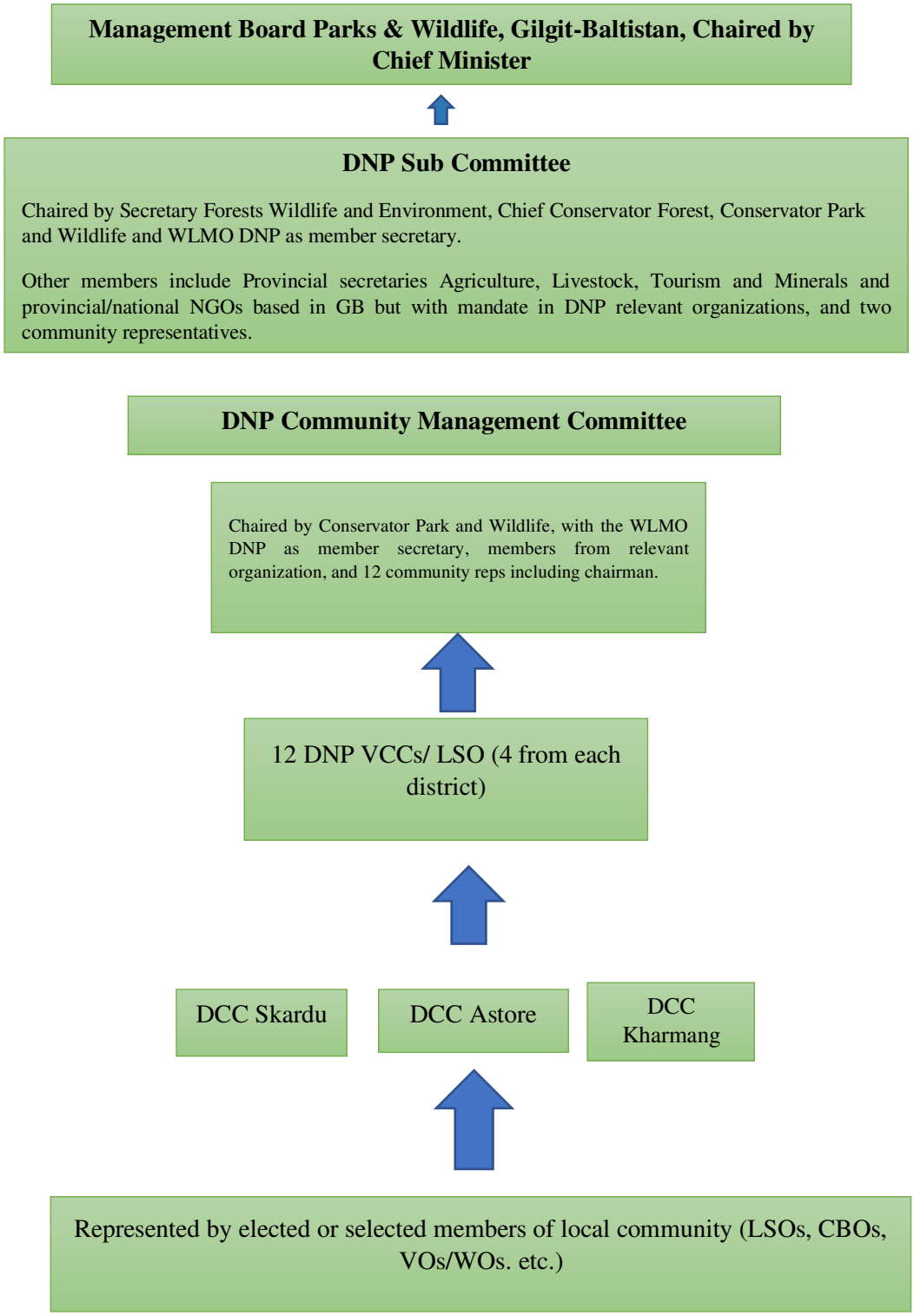
Proposed Functions

- Make sure that DNP maintains its ecological health and does not deteriorate due to excessive uses of its natural resources. This should be made possible through building consensus in meetings of the committee, seeking guidance from relevant experts/ departments.
- Undertake issues related to visitor facilitation, maintenance of camping sites, cleanup operations, rescue etc.
- Responsible to distribute funds (entry fee) among the deserving communities.
- Resolve conflicts among members communities related to the entire park.
- Pick points of discussions and needful approval by the sub-committee.
- The committee shall meet at least twice a year.

Proposed Structure

- Chaired by Conservator Park and Wildlife, with the WLMO DNP as member secretary, members from relevant organization, and 12 community reps including chairman.

Graphical representation of the above committee is given below;



4.3. Single Park Authority

DNP is closer to the border between Pakistan and the Indian held Kashmir, and so for security reasons, Pakistan armed forces are posted in Gultari, Minimerg, Qamari and Kharmang sectors, surrounding the Park. Though there is no evidence of illegal hunt or offence by these forces inside the park yet following their own notions may interfere in the park affairs in and outside

the park boundaries. For instance, they may allow some graziers, or stop others in certain areas, due to which local graziers may feel more subject to forces then to park authorities. Consequently, park rules and administration may relegate to a secondary position or no position at all. Similarly, while they are powerful in terms of legal authority, park watchers dare not to check a Forces vehicle on the park barrier even if they are sure of the presence of a trophy or wildlife carcass in it. Due to this and several other reasons, forces enjoy greater authority than the park administration would do.

Similarly, GB Public Works department has planned to construct several connectivity roads through DNP to provide links to the border villages of Skardu and Astore. Pakistan Air Force had planned to build an airbase in Deosai. Recently, a new inter district connectivity road has been passed through Deosai to link Astore with Skardu. Most of these roads and other infrastructures though provide linkage, connectivity and strategic services to far off border villages and forces but simultaneously, bifurcate the core and home range habitats of the endangered Brown bear and other associated wildlife species of the park, affecting their ecology, behavior and food availability at large. Legally, DNP is an IUCN Protected Area Category I National/Wilderness Park, where no such developments are lawfully permissible and allowed. 11 Proposed infrastructure development plans for DNP (2015) by Himalayan Wildlife Foundation

In order to manage the above situations, the following decisions are proposed:

- Generally, military activities are discouraged inside National Parks, except for study of military history in relevant PAs. However, locally stationed force units may periodically request the use of NP territory for non-combat exercises. In such a case, the Park Management should have the discretionary decision power to offer or excuse offering the Park area for such activities where appropriate following the Park rules.
- The park administration should be declared as the top authority for the park, responsible for and authorized to decide on all issues, which are either related to or have possible impact on park resources, especially about visitors and graziers. Their decision should however be considered as final.
- The local in-charge of Armed forces posted in the vicinity of the national park should be involved in Park management through clear advice from the Force Commander Northern Areas (FCNA) to cooperate with the park officials and assist them in their duty to help protect park resources.
- Local in-charge of the Army and GBS should be held responsible for the violation of park rules, especially hunting, killing, poaching of wild animals and transportation of their trophies or removing vegetation by the force men inside the park boundaries.
- All the connectivity roads should be laid outside the core habitats of Brown bear and other associated wildlife and the fragile alpine vegetation zones.

Conducting detailed EIA should be made compulsory/mandatory for all such projects and corrective measures taken, compulsorily as per EMP devised, to minimize their negative impacts on the Park and its ecosystem.

4.4 Resource Plan

4.4.1. Existing administrative arrangements

At present, the Park is being administered by an eighteen-grade official of the Gilgit- Baltistan Forest & Wildlife department, as DFO/WLMO, having an established directorate at Skardu. Wildlife Management Officer (WLMO) is officially responsible to look after all technical, administrative and financial affairs of the Park. Under him, is strength of 17 regular staff including 01 RFO, 12 Game Watchers and 04 Admin personnel. Thirty-three staffs have been working against the present development scheme namely; "Management of Deosai Wilderness Park NAs", though majority of them are engaged on short-term contractual basis. The number and placement of regular staffs is as under:

Exhibit 4: Existing core, supervisory and protective field staff in DNP

Staff	No.	Infrastructure	Location
Wildlife Management Officer (PBS 18)	01	RFO Office/ Rest House	Astore
Office Superintendent (BPS 16)	01	Check Posts (1)	Satpara
Accounts Assistant (BPS 11)	01	Check Posts (1)	Chillim
Game Watchers (BPS 5)	12	DNP	Bara Pani
Driver (BPS 4)	01	DoDNP	Skardu
Naib Qasid (BPS 1)	01	DoDNP	Skardu
Total	**17**		

4.4.2. Proposed staff structure

The available field staff strength is inadequate to provide sufficient vigilance and care to wildlife and other precious resources of the Park. The position of Park Director is laying vacant and even, the Park has no regular Range Forest Officers (RFO) to supervise field protective staff. Similarly, twelve numbers of Game Watchers with no means of transportation can never be enough to effectively protect 3000.7 sq. km area. However, the present staff, even if vacant posts are filled and provided to the Park, may not be sufficient to achieve the objectives of conservation at the desired level until the positions are given specified assignments, relevant expertise, proper training and logistic support. Please see the Institutional Development Plan (2015) by HWF for details.

Environmental awareness and Eco-tourism promotion are two processes suggested to be continued so, in order to implement the plan in its true spirit and manage park resources on sustainable basis, the plan suggests hiring the following additional technical, service and support staff for implementation of the Management Plan:

Exhibit 5: Proposed strength of core, technical and field staffs for DNP

Title of post	BPS	Total required	Existing	Required
Technical / Professional Staff				
Park Director	19	01	00	01
Deputy Director/WLMO	18	01	01	00
Tourism Officer	17	01	00	01
Biologist	17	01	00	01
Limnologist	17	01	00	01
Social Organizer	17	01	00	01
Education Officer	17	01	00	01
Veterinary Officer	17	01	00	01
GIS Analyst	16	01	00	01
Range Forest Officer (RFO)	16	02	00	02
Park Inspector	12	03	00	03
Game Watcher	7	30	12	18
Support & Service Staff				
Office Superintendent	16	01	01	00
Assistant Accounts	14	01	01	00
Computer Operator	14	01	00	01
UDC	11	01	00	01
LDC	9	01	00	01
Driver	4	03	02	01
Chowkidar	2	04	01	03
Grade I	1	03	01	02

Positions and Terms of References for All Park staff

As obvious from the staffing structure on above page, a senior position of Wildlife Management Officer (BPS 18) is already available to DNP but the position of Director Park (BPS 19) is for the time being vacant.

At present, interestingly, there are three Park directors of grade BPS 19, one each for KNP, CKNP and DNP, supposed to look after 5000, 10000 and 3000.7sq. km areas of the KNP, CKNP and DNP, respectively. However, in real sense, the Director KNP has been providing

vigilance and care to only 500 Km^2 area of the park, mainly along KKH. Contrarily, the entire Gilgit-Baltistan, encompassing more than 72,000 Km^2 area, having a network of 05 National Parks, 03 Wildlife Sanctuaries, 07 Game Reserves and 24 Community Controlled Hunting Areas (CCHA), is administered by the Divisional Forest Officer, (Wildlife) in BPS 18. Territorial DFOs (BPS 17 or 18) are responsible to protect wildlife in areas outside the Protected Areas under direct supervision of the Conservators of Forests & wildlife, Gilgit and Baltistan (BPS 19), which shows that the officers in senior positions remain usually under-occupied because of very small area under their control and work load, compared to officers in similar grades of other departments. Furthermore, the Wildlife Management Officers (DNP & KNP) and Deputy Director (CKNP) holding grade 18 positions, in the presence of Park Directors are extremely underutilized, even, seem surplus sometimes. Therefore, in order to utilize their time, energy, knowledge and experience efficiently and more productively, the plan proposes to re-designate the position of director KNP (BPS 19) as Conservator Parks & Wildlife Gilgit-Baltistan and placed in Gilgit as in- charge of all wildlife and parks affairs. DFO Wildlife, Wildlife Management Officers (KNP & DNP) and Deputy Director (CKNP) of grade BPS 18 officers should be re-designated as Deputy Conservator Park or Park Warden and placed in their relevant districts as Park Managers to look after their respective parks. They will directly report to Conservator Parks and Wildlife GB.

In addition to the above already existing positions, the plan proposes a few new positions to implement the plan. A brief description of each post is given below:

Park Director (BPS 19)

Recruit staff for government executed component and engage consultants; facilitate coordination and collaboration with controlling authorities, project partners and stakeholders in the privilege of DNP management and project activity implementation, supervision of all technical and financial affairs of the DNP directorate; provide leadership to project staff ; be responsible to enforce regulation in connection with protection of park resources; be responsible to involve stakeholder communities in the participatory management of park resources.

Biologist (BPS 17)

Park Biologist will be responsible for ecological assessments; development and implementation of thematic as well as conservation plans; train project staff in the data collection, use of equipment, data record, analysis and application, establish baseline information, set biological indicators as part of a community-based wildlife monitoring system and standard wildlife monitoring protocol; guide and coordinate biodiversity research in the project areas, collection of park entry and camp sites flat fee, manage waste in DNP, and report to the Deputy Director on regular basis.

Limnologist (BPS 17)

A limnologist needs to observes and reports on freshwater inland ecosystems, such as streams, ponds, lakes, and marshland, conduct chemical analysis and take plant, fish and water samples

to understand ecological impact, prepares water management plans, and collaborates with government agencies to manage the environmental impacts of human consumption and waste.

Social Organizer (BPS 17)

Social organizer will be responsible for keeping liaison and coordination with partner organizations, communities and other stakeholders concerned; will initiate dialogues with target communities of un-approached valleys; mobilize communities for participatory resource conservation; establish social structures for smooth implementation of project activities; facilitate field implementation of social mobilization related activities; resolve inter and intra community conflicts, if arise over common resource uses, and assess and conduct trainings of the village activists and communities.

Education Officer (BPS 17)

DNP was established in 1993, and till now it is present on the map, but so far it has not been successful in meeting its objectives of protecting its natural resources. One major reason for this is the lack of public education and general awareness. The need for such education becomes more important in situations like that of DNP where peripheral communities and visitors exploit park resources unwisely putting the park at risk. In order to spread the message of conservation to local communities, visitors and other stakeholders, and to seek their support and cooperation for park management, a full time Education Officer is suggested to be hired and placed within the park area.

Ecotourism Officer (BPS 17)

Deosai has tremendous tourism potential but ill-managed tourism activities during the past couple of years have been a threat to Park resources. The Gilgit-Baltistan Tourism department (GBTD) cannot fulfill the requirements and demands of eco-tourism in Protected Areas, especially in DNP. Although it has established tourist information Centre in Chillim to facilitate tourists but this plan suggests promoting sustainable tourism in the park area to generate revenue for the Park and its buffer zone communities. Which is a specialized field requiring effective planning and management as per the needs of tourists as well as the tourist carrying capacity of the Park, and subsequent monitoring to avoid any harmful impacts to Park ecosystem. Therefore, a full-time ecotourism officer will be required to meet these needs.

Veterinary Officer (BPS 17)

Transmission of diseases from livestock to wild animals on shared habitats is a common problem in Protected Areas, as people graze their livestock in pastures and rangelands where ungulates live and feed. In DNP, local and nomadic herds quite often graze in the same areas, which increase the chance of disease transmission from livestock to ungulates. In order to reduce chance of such incidences, livestock from the peripheral valleys need to be vaccinated on regular basis, before they are taken into the Park vicinity, which obviously can be done by a permanent veterinary staff of the Park. Moreover, sometimes, wild animals are injured and need instant treatment and care. Therefore, the plan suggests engaging a full time Veterinary Officer to meet such animal care and vaccination needs.

GIS Analyst (BPS 16)

Develop maps of National Park, Valleys, resources, Data analysis through GIS. Verify GPS coordinates of vantage points of wildlife surveys, taking coordinates of plantations, signage, tracks, and camp sites and manage them properly and develop maps as per need. Train staff in GIS and Remote sensing. Assist Biologist in Ecological assessment and monitoring and report him on regular basis.

Range Forest Officer (BPS 16)

Unrestricted grazing of livestock by both locals as well as nomads is a major issue in DNP. However, as per the prescription of the management plan, the local community will be allowed to graze their livestock in the grazing zone of the Park, which again would not be easy to enforce in true spirit without assessing the productivity and carrying capacity of different pastures based on which a specific number and kind of livestock will be allowed. There are quite a few qualified range experts available in PFI, NARC, AARU and WWF who may provide useful guidance on several range related issues of the Park, but only permanent park official who are responsible for rangelands can do effective implementation and monitoring of the pastures and rangelands. So, the plan suggests that grazing pressure in the park be minimized allowing scientific grazing in grazing zones only and also by developing alternative grazing areas outside the Park boundaries, for which a permanent employee stationed full time within the park would be required.

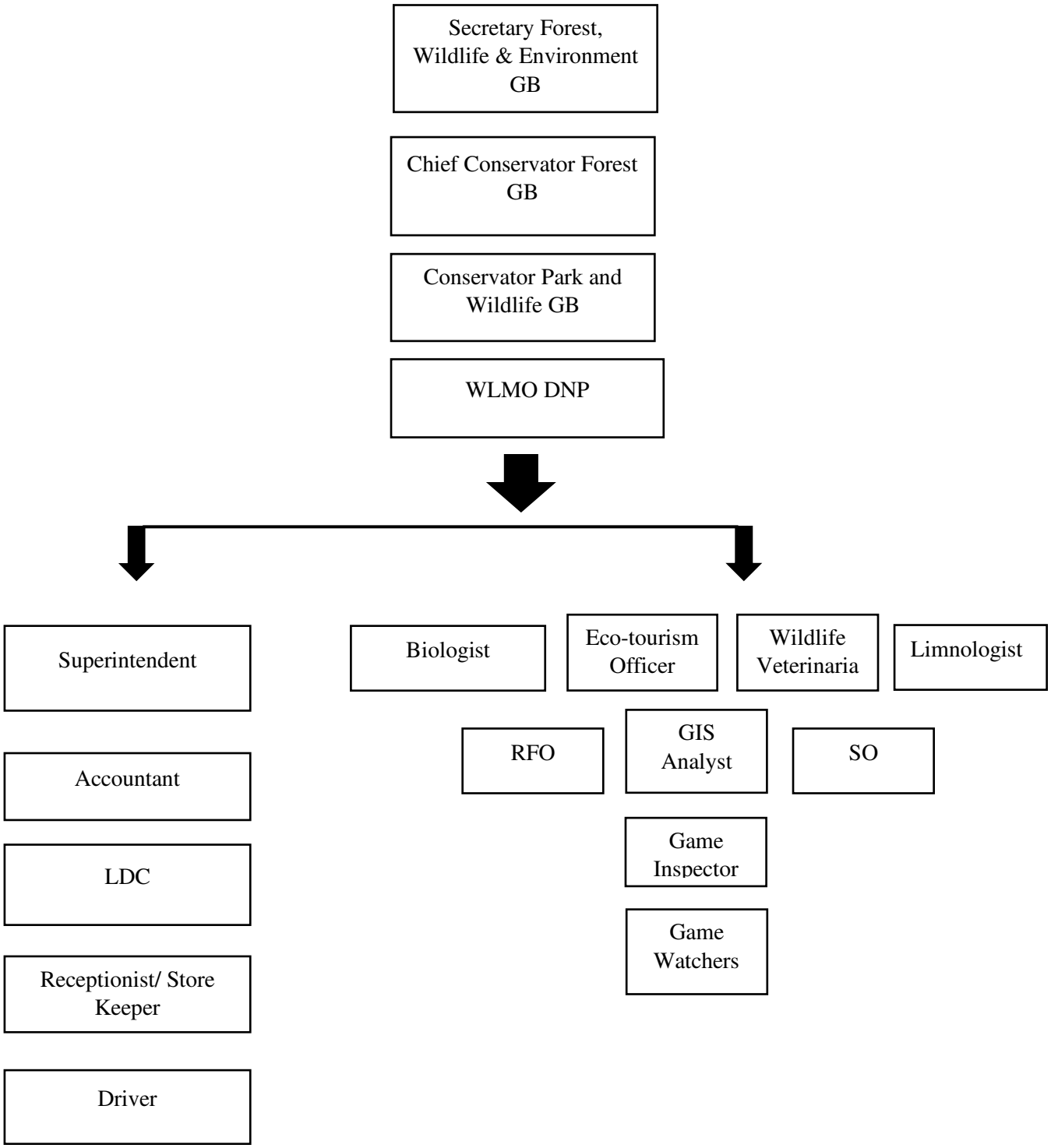
Park Inspector (BPS 12)

Supervise duties of Game Watchers, obtain monthly and seasonal wildlife assessment census reports including forest and wildlife offence reports from Game Watchers, compile these reports and furnish to higher authorities, Coordinate efforts with community wildlife guides and register offence cases on the recommendation of community conservation committee President or his nominee for proper legal action, be vigilant in respect of any illegal anti-conservation movements in the respective jurisdiction and take into confidence the community conservation committee members for preventive measures or otherwise.

Game Watcher (BPS 7)

Game Watchers will be charged with responsibilities of protecting wildlife and their habitats including forests, pastures and rangelands; conducting ocular wildlife population assessment and surveys; and furnishing monthly and periodical census and observation reports to the Game Inspector concerned; and also coordinate activities with community appointed Wildlife Guides (if any) in protecting natural resources and where required enforce regulatory laws. Be responsible to accomplish the activities assigned by the office including camp site management, waste management, signage, trails and other interventions in their respective duty areas.

Proposed staff organogram for DNP



4.5. Budget

4.5.1. Estimated cost (PKR)

Exhibit 6: Estimated cost of implementation of the Management Plan for DNP

Ref	Items	Total
A.	Staffing	79,168,177.29
B.	Buildings & infrastructure	4,531,000.00
C.	Equipment	2,606,000.00
D.	Training and Capacity building	187,500.00
E.	Programme cost	8,688,315.00
F.	Office running cost	492,802.50

4.5.2. Proposed implementation schedule

Exhibit 7: Proposed timeframe for implementation of Management Plan

Ref	Items	Year 1	Year 2	Year 3	Year 4	Year 5
1.	Staff hiring	12,967,548.00	14,264,302.80	15,690,733.08	17,259,806.39	18,985,787.03
2.	Buildings & infrastructure	3,925,000.00	260,000.00	291,000.00	12000.00	43,000.00
3.	Purchase and place equipment	2,606,000.00	0	0	0	0
4.	Training and Capacity building	187,500.00	0	0	0	0
5.	Programme cost	2,206,250.00	1,643,125.00	1,598,000.00	1,685,400.00	1,555,540.00
6.	Office running cost	295,000.00	47,500.00	47,750.00	52,775.00	49,777.50

APPENDICES

Appendix 1: STAKEHOLDER CONSULTATION

- **Objective of the Consultation**

Identify major challenge's, gaps, and interactions and stakeholders' perceptions to address the existing and potential challenges of DNP.

- **Summary of Findings**

Deosai plains being located in between the districts of Astore and Skardu naturally provide resource use rights and grazing stakes to the peripheral communities of Astore and Skardu. Alongside, the Gujjar Bakarwals (nomad herders) also visit the plains during summer months with their domestic herds for grazing and use the forage, forest, fish, peatlands and water resources for food, fuel, fodder and medicine during the days of their stay on the plateau.

After establishment of the park in 1993 followed by somehow enforcement of Park regulations, the communities were restricted from the use of park resources, affecting their traditional and customary resource use rights. Since socio-economic conditions of the resident communities were abysmally below normal standards, so the imposition of rules and restrictions without prior consultation and provision of adequate alternative sources of livelihood and family income led to indispensable community concerns and even to community conflicts over resource use rights and concessions. Lack of appropriate management systems further aggravated the concerns of dependent communities on conservation and protection of Park's biodiversity.

Keeping in view the importance of community-based management of a protected area, Park authorities intended to involve buffer zone communities of the Park in its management. For this purpose, the park directorate jointly with Ev-K2-CNR initiated a detailed consultative process with the concerned communities of Skardu and Astore districts. Consultative sessions and community meetings were held at Skardu and (Chillim) Astore to identify key stakeholders, fundamental administrative and management issues, resource use concerns and conservation challenges and to seek suggestions for improved management and development of Park resources.

Major Concerns

Consultative meetings and workshops were held in Skardu, and Astore to get inputs for development of a better-revised management plan for the DNP. The participants shared their concerns, opinions and suggestions about effective management of the national park, which is home to some of the world's rarest species, including Himalayan Brown Bear. Ev-K2-CNR organized the workshops in consultation with DNP office and Parks and Wildlife Department. Experiences, problems and opportunities related to national park management came under discussion and solutions were suggested to effectively tackle the emerging threats and challenges to the park and its resources. Based on the analysis, following major themes were

identified: (1) tourism (2) management issues (3) development issues (4) policy concerns (5) lack of comprehensive scientific data (5) Increased anthropogenic pressure.

- **Buffer Zone Community Concerns and Priorities in DNP**

Role of communities in the management of protected area is extremely significant. It is very important to engage with them on a continuous basis mobilizing them and raising awareness about their role in the conservation and management of the park at large.

The people appreciated that termed the park an asset that they live in its lap. They knew already about the park and its features with the knowledge of the wildlife inside. However, they mentioned that they were not very happy about the visits of the high ups of the park management who are not so frequent in visiting the area. They responded, to a question that there is no revenue of the park shared with the communities in any form received as a fee neither there is any mechanism in place for the distribution. In response to the question regarding how the revenue could be shared with the communities, they said that the fee collected at different entry points can be distributed among the buffer zone communities for conservation, community development or other similar purposes.

The communities have the use rights inside the park mainly for grazing. The hunting is banned and efforts are made to ensure to control hunting and forest cutting through panelizing the offenders by the community. Although, the hunting has been controlled largely however, still people do hunt killing ibex. They proposed that the government must also play a very significant role to control hunting with strict laws and their enforcement together with the local conservation organization. They also expected DNP directorate to pro-actively work in supporting the communities in conservation of natural resources and community development.

The people living around DNP expressed their happiness for being in the buffer zone of the DNP. DNP natural resources are incentivizing the local communities with fresh water for drinking as well as for irrigation, grazing, attracts tourists and provides employment opportunities for the locals. The buffer zone communities are very concerned regarding poor facilities of education, health, access roads, communication, fuel wood, climate change and sharing of park revenue.

Lack of community participation

The communities living near the DNP should have a hand in management and should derive some benefits from the area. A draft wildlife law empowering local communities to participate in joint wildlife management with governments has been prepared and is currently under review. Local communities rarely have any role in the management of DNP. Little progress has been made on instituting collaborative management. Few efforts have been directed at raising public education and awareness in areas adjacent to the DNP, providing environmentally sound and sustainable development assistance to local communities or formulating appropriate packages of incentives and disincentives. Consequently, local communities continue to disregard protected area provisions leading to degradation of the protected area. Moreover, where those provisions are enforced against local communities' interests, conflicts have arisen.

Administrative Issue

After consultative meeting with Astore communities, found out an important issue that is lack of DNP administrative structure in Astore District as it is already mentioned in approved DNP management plan (2016). People of Astore demanding separate administrative structure in Astore District. For the better management of the DNP and need an RFO for Astore district, who should be responsible for management of the park from Astore side.

Revenue Share Mechanism

In 1993 it was agreed between the Government and the local communities that there will be a benefit-sharing mechanism that how the adjacent local community will get benefit from wildlife conservation, community claims. It was agreed that 80% of the resources in the form of entry fee generated will be spent on the community but nothing has been done. Even nomads are being charged for grazing fee by the Astore Forest Division, and 80% of which should go for the community development but the community did not receive anything yet.

To the majority of communities, the park has created very fewer employment opportunities and the social welfare of the community did not improve.

With this large share of land devoted to conservation, conflicts arising from the distribution of costs and benefits considered unfair to local residents can create a big issue in the establishment of a protected area.

Brown Bear Attacks

According to the community, it is a continuing challenge to protect and live with Himalayan Brown Bears which are increasing in numbers. According to the local population, the numbers of bears in DNP is more than 100 keeping in view their frequent visits to nearby villages and sighting of cubs along with mother. The community says that brown bears tend to be shyer or at least less visible, and seem less willing to go where people are abundant but they are becoming bolder and walk into the villages and nearby Nallahs and attacking people property, food and livestock and their presence stirs fear. Brown bears are the ones that most frequently get into human garbage and they have also learned that humans are a great source of easy to get food.

Compensation

Large predators such as the Himalayan brown bear fulfil a key role in many ecosystems and are admired by many people. However, they also cause damage by preying on cattle, mules, destroying and eating arable crops. To minimize the resulting conflicts, the people affected should receive compensation payments. This compensation is an important instrument for protecting the brown bear and other large predators. Despite a hunting ban and extremely protected species and without any compensation scheme, the attitude to bears becomes increasingly hostile, some villagers may take the matter into their own hands. There are other predators involved as well as wolves and snow leopards but the brown bears are the most visible threat to the community.

Establishment of Camping License for DNP

The residents of DNP buffer zone community have established tent hotel businesses inside DNP including Ali Malik Top, Bara Pani, Kala Pani and at Sheosar Lake with the agreement of park directorate and the community refers it to the 1993 agreement through which DNP is established. Recently Parks and Wildlife Department of Gilgit Baltistan advertised tender inviting proposals for setting up good hotels in DNP for the tourists as the tourism in the region is on the boom. But the local community is against to this act of government and received stay orders from the court against the tender. Community-based conservation is based on the idea that if conservation and development can be simultaneously achieved, the interests of both are served. The community was of the view that broadest sense includes conservation by, for, and with the local community.

Government of Gilgit-Baltistan has prioritized Ecotourism to uplift socioeconomic conditions of the local communities and to value the environmental conservation in the region. High alpine pristine ecosystems like Deosai Plains are being opened for ecotourism services, which host Brown Bear and Marmot and many rare species of flora and fauna. The GB Forest and Wildlife department had planned to issue license to establish and run camping sites at each national park under three categories through private contractors and tour operators. This bidding announcement raised an uproar in the buffer zone communities of the Park and the Hoteliers running their business during summers inside the park. They received notices to close their businesses and to participate in the bidding procedure. Community straightforwardly refused the idea and feared that their livelihood source could be hampered, took the matter to the court against Parks and Wildlife Department.

Accessibility

The accessibility to some of the valleys is very difficult and becomes impossible in Winter such as Karabosh and other villages of Gultari, Shigarthang, Shilla and Dappa. These community consider the accessibility to the valley is the most superior concern to them. For Karabosh,it may take 7 to 8 hours to reach the village from Skardu on the bumpy and rocky jeep able trek. Community blames this bad road as the main reason of the migration of population to cities. Gultari community demands to build a road from Bara Pani to Das village which can solve majority of the problems but it has to be crossed from the core zone of the park which becomes a conflicting issue.

Livestock

Overall, the livestock rearing trend has been declining from last few years because of less availability of fodder for livestock, lack of interest in the young generation, less economic returns from livestock and adaptation to alternate income sources. Community members were of view that common ailments and diseases in livestock are abundant. One of the main livelihood sources for the community is livestock. But 10 % animals are often sick or facing some health issues and 5% killed by wild animal in a year. The buffer zone valleys lack veterinary facilities, medicines and trained vet technicians. Ev-K2-CNR under the UNDP MPA project trained one person from each valley in agriculture and one in livestock and also gave veterinary kits.

Nomads

The community has grazing rights inside the park but they bring very fewer animals inside the park. Due to several reasons, the buffer zone community is not happy with nomads. According to them, nomads are responsible for land degradation and smuggling of wild herbs. Their goats and sheep overgraze the summer pastures and compete with wildlife and their dogs kill Golden Marmots. According to the buffer zone communities, yearly basis nomads bring approximately 9000 to 10000 animals inside the park.

Agriculture

Still the largest part of the population is affiliated with farming. Community shared that agriculture now a days declined both in quantity and as well as in quality. The major crops are Barley, Wheat, Potatoes and Millet. In last 10 years the community is witnessing new diseases and pests to their crops which were nor common earlier. Halmand variety of apricot is considered the top-notch variety in edible apricots but its production has been reduced and especially due to attacks of certain pests like mealy bug and hairy caterpillar.

Forest

People from buffer zone valleys are really nature loving and take care of natural resources. Community on their trying hard to preserve remaining forest patches particularly in Gultari area, ShigarThang, Gayol and Burgay. The community is fulling their wood fuel needs through electricity and purchase of wood from Skardu or Khaplu market. People have fruit trees in their fields so branches and dead/ old fruit trees are also used for timber and fuel wood.

Majority of the fuel wood is needed in winter season for heating and cooking. Apart from the market and own fruit trees, community also harvests shrubs like Artemisia from the mountain slopes and use for fuel and as well as to cover the roofs in construction. Community needs alternative sources of energy such as solar plants, electricity and fuel-efficient stoves to meet their fuel wood needs and as well as to conserve the forests and other vegetation.

Wildlife

Community members were of view that they cannot see frogs now a days and also the diversity of butterflies reduced. Snakes are also not sighted since long. There were birds which us to visit the valley in winters but now there are no more from last 4-5 years. Crow population also decreased. Community perception was that due to the use of inorganic agricultural input including pesticides, weedicide and chemical fertilizers has reduced the number of birds, scavengers and pollinators.

The community is still sighting the Ibex and Must Deer in nearby mountains and watershed areas. Community was in concern that they are not witnessing some species like a yellow color bird, used to visit the area and feed on berries of Russian Olives, is not being seen frequently and also large big crows and other scavengers and some reptiles disappeared. The reason they shared is that they used to poison the animals and birds which they don't like and this can be the reason that the diversity of animals and birds reduced drastically.

Sparrows were abundant in the valleys but in last three years their population reduced drastically as their nesting ground was the mud houses but gradually all the houses have been converted to cement ones so these birds also disappeared.

Climate Change

The grass available in the pastures is of less height as compared to the grass 10 years ago and same the case with the flora of Deosai National Park and community is of opinion that due to ill managed tourism, pollution, heavy traffic flow, less rain and snowfall this all happening. There is a lot of off trek driving in DNP and more tourist influx which is destroying the fragile ecosystem of the park.

- **Conclusion and recommendations**

Conservation of biodiversity in a sustainable way is vital for the future of any region. Gilgit Baltistan has taken practical steps towards protection of environment in a manner. Many efforts have been made for protection and improvement of environmental biodiversity to reach the international standards. However, there are still too many gaps and differences due to lack of proper management of activities. It is necessary to take serious actions for effective management of mountain-protected areas in Gilgit Baltistan. After comprehensive analysis of the present situation of DNP, the following recommendations are put forward

The most important issue regarding the development of National Parks according to international standards is enforcement of existing laws in more effective mode. Although laws related to environmental protection been formulated since the independence of the Pakistan but their implementation is very rare or partial. Law enforcing agencies should provide implementation of rules and regulation in a firm way without any exception.

Residents of periphery of DNP play important role in effective conservation strategies. The alternative income sources need to be provided to local people if they are dependent upon natural resources for their livelihood. For this purpose, local community must be benefited from development activities related to areas. Moreover, local community's participation in management activities can also enhance the viability of DNP. Therefore, results that are more positive can be achieved through effective policies related to community involvement.

Park directorate need to have resources and support from national and international organizations in raising awareness among the tourists. It is also necessary to help local communities living in the buffer zones of the national park to realize their role in waste management giving them awareness on their role and responsibilities.

Conservation Fund needs to be set up for the DNP to ensure protection of the park and community development. Gujjar-Bakarwals should be curtailed through management policies such as how many nomadic families to be allowed, kind and type of animals to be allowed, specific route and stop overs, complete ban on their entry to the core zone, grazing fee and issuance of grazing permits by DNP Directorate.

Bear Concentration sites and possible expansion zone: The current surveys of Ev-K2-CNR reveals that the presence of Brown Bears for various activities outside of the legal boundaries

of the Deosai National Park. This indicates the possible expansion of brown bear population to surrounding areas because of better protection to the available bear population. Accordingly, this is required that any increase in population of bears and dispersal to surrounding areas must be accommodated by incentives and regulatory mechanism in the buffer zone.

Appendix 2: List of valleys and villages

Valley name	Village name	Population	Households
Satpara	Chogho-ghron	480	50
	Skill Ghrong	376	35
Karabosh/ Shingoshigar	Nogam	256	28
	Hunthali	176	22
	Patothalli	48	6
	Dudyal	280	25
	Das	200	22
Shilla		560	50
Dappa		1440	135
Shagarthang	Stak-chan	210	25
	Bull-cho	80	10
	Gamb Ghorong	240	30
	Gong –ma-Ghorong	175	25
Burgay/ Gayole	Chos Pa	480	45
	Blaghar pa	576	60
	Fa Pa	640	70
	Khar pi to	440	40
	Rang na Pa	680	85
	Ba To Khor	560	60
	Spang Thang	320	30
Chillum	Sherqully	385	35
	Chillum Dass	140	15
	Lamba Chashma	70	10
	Dirlah	105	12
	Dirlah chak	56	8
	Palinyat	84	10

Valley name	Village name	Population	Households
	Dass Bala	280	35
	Dass Pain	56	7
	Kakn Bala	56	8
	Kakn Pain	560	70
	Kharim Daree	210	20
	Kharim	840	105
Bubin	Bubin	420	55
	Murat	105	15
	Yagam	280	35
	Bumroy	245	30
	Kharbey	175	18

Appendix 3: Customary laws for management and conservation of natural resources around DNP

The customary practices of eight main settlements around DNP assesses through interviews with structured questionnaire and open-ended questions. There are different customary laws in various valleys of Gilgit Baltistan to manage the local resources which will be discussed one by one in following discourse;

- Agriculture/Land use
- Fuel wood and timber
- Pastures
- Livestock
- Wildlife
- Water

Valley	Park natural resources	Customary practices
Sadpara	Harvesting of forest and other natural vegetation	The cutting of green wood from the natural forest is banned for the last 15 to 20 years. The ban has been imposed by the locals and is being supported by the relevant Government department. The locals mostly subsist on fallen and dry wood for their domestic usage with none of the wood being transported to other areas. If someone is caught with the fresh wood, he is fined and the wood being seized and confiscated. For their home construction they can bring some dead, dry and diseased trees from their nullahs forest. It is community rules that no green standing should be harvested but they can harvest poplar specie as they grown it on their own lands or on banks of streams and water channels. But trees are harvested illegally at unsustainable level from buffer zone of the DNP, and used as fuel wood and timber.
	Medicinal Plants	Community harvests very few medicinal herbs and aromatic plants from Park and buffer zone for household purposes, such as Tumburk. Mostly remove whole plant from the soil.

Valley	Park natural resources	Customary practices
	Livestock grazing	The local communities of Satpara have set procedure for grazing their livestock in pastures. In summer the livestock are taken to open pastures located upstream in the high-altitude alpine pastures except for a few who are kept for milking. One male from each house hold for certain period of time or days would accompany the herds. They also send their animals to Deosai National Park in the month of June and continue up to August. In the months of September and October, when harvest of the crops and its storage is over, livestock are brought back from pastures to the villages where free grazing is then practiced throughout winter.
	Pastures	According to the community they are not bringing grasses from the pastures, usually they grow fodder crops on their own fields but they bring fuel wood and medicinal plants.
	Wildlife	Hunting is strictly banned, nor locals and neither outsiders allowed to hunt in their area.
	Water	Traditionally water is considered as important natural resource as it is critical for local agriculture and livelihood. Valley community has developed infrastructure, institutions and rules to ensure water is fairly distributed for agriculture needs. Drinking water sources are protected and washing clothes and other form of defilement are strictly prohibited. Every household send its representative for the community work for construction of new water channel, cleaning the water channel and its maintenance. Maintenance, clearing and cleaning of water channel is the responsibility of those land owners from whose land these channels pass

Valley	Park natural resources	Customary practices
		through. Water from the nullahs are diverted through water channels and then the main channels are divided into smaller ones to make water accessibility easier.
	Agriculture/land use	Principal land use in of Satpara is dominated by subsistence cultivation, fruit production, livestock raising and forestry. However, they set aside a part of their holding for the purpose of growing fodder. Apart from the private holdings, there are community lands, which are the lands whose allocation and use is decided under customary laws. It has been a customary rule that all segments of the community get equitable share in the rights related to common lands.
Burgay	Harvesting of forest and other natural vegetation	In Burgay valley half of the fuel wood requirement is fulfilled by own resources like poplar or fruit trees and 10% is brought from forest reserve and the rest is purchased from the market. Apart from wood a good quantity of cow dung cake is used as a source of fuel. The cow dung consumption is about 2000 Kg in a year. Artemisia is commonly collected for fuel wood in the area. According to the community responses they don't bring wood from the forest or park area, instead they have communal land from where they bring wood and also the poplar, willow and fruit plants wood in their own family land they use for timber and fuel wood.
	Medicinal Plants	100% community is aware about the importance of medicinal plants and 20% of the population use them regularly in case of any sickness. The collection of medicinal plants is being carried out in traditional ways, which is not sustainable and, in some case, they uproot the whole plant. Every household has some

Valley	Park natural resources	Customary practices
		information about some medicinal and aromatic plants and herbs. Some medicinal plants like Toumbro is commonly used for cold and cough. The use of medicinal plants among the community is also declining due to the lack of knowledge and identification of plants and their use. Only the senior and elder people have some information about plants. The community extracts the medicinal plants from their communal land and pasture.
	Livestock grazing	During the summer, they kept their livestock in higher pastures for 5 months, causing a lot of pressure on the pastures and increasing the risk of degradation.
	Pastures	During the summer season, the people of Burgay take their cattle to small ruminants to community pasture land. Then to sub alpine and alpine pastures in May till September. A few numbers of zo and zomo are grazed inside the park area.
	Wildlife	Community were using Musk Deer leather for their Amulet.
	Water	Valley has very complex water distribution system. Water availability needs to be improved through updating customary practices.
Dappa	Harvesting of forest and other natural vegetation	In last four decades, forest have been completely dissipated due to excessive forest cutting for timber and fuel.
	Medicinal Plants	Every household has some information about some medicinal and aromatic plants and herbs. Some medicinal plants like Toumbro (for cold and cough), Zeera (for digestion and bad stomach) and Khraqhrsa (for controlling blood pressure) are commonly used. However, its uses among the community is also declining due to the lack of knowledge and identification of

Valley	Park natural resources	Customary practices
		plants and their use. Only the senior and elder people have some information about plants. The community extracts the medicinal plants from their communal land, pastures, buffer zone and as from the park.
	Livestock rearing	During the summer season, the people of Katisho take their cattle to Deosai and keep them there till the autumn season. The grazing season starts with spring and the start of agricultural activities. Normally residents of Katisho and Daapa send their animals in the first week of June and bring them back in the first week of September every year. One of the main sources of income is subsistence livestock rearing. Every household keeps one milking animals and a small flock of poultry. They are more inclined towards jobs in urban areas and also this profession is having less economic returns and fodder availability is a big challenge to them. The community in both cash and kind pays the herders.
	Pastures	Community have their own communal sub alpine pastures, buffer zone and as well as have grazing rights in DN. The health of pastures, the community responded that the majority of pastures are in good shape and healthy, but less grass is evident from so many years and the reason is unknown to them. The overall livestock-rearing trend is decreasing due to lack of interest from the young generation, other sources of employment and also controlled grazing. Apart from cows all the livestock, including zo/zomo, goat and sheep are sent to alpine pastures in the start of June to end September.

Valley	Park natural resources	Customary practices
	Wildlife	People are quite friendly to wildlife they do not hunt. Hunting is totally banned in the valley by the valley conservation committee. The community did the last hunting of an Ibex about 20 years ago.
	Land use/Agriculture	They are using the old style of cultivation and traditional crop varieties so they are not much productive.
Karabosh	Harvesting of forest and other natural vegetation	The cutting of green wood from the natural forest is not allowed. One house hold is allowed to bring one tree in year from the forest provided that the tree is dry, dead or diseased. For fuel wood they have their nullahs from their community collect firewood. According to the community one house hold is allowed to collect one tractor load in winter season which is approximately 4000 Kgs.
	Medicinal Plants	The use of medicinal plants against common ailments are quite common in Gulatri. However, young generation is not so much aware about the medicinal herbs, just a few elderly people have the knowledge.
	Livestock grazing	In summer season the local people herd their livestock to the near alpine regions where sufficient forage sprout. Besides local people some herdsmen from outside also visit these alpine pastures along with their livestock to take benefit of the nutritious fodder in these ranges. One male member is mandatory to accompany herds in pastures time period and there are set rules.
	Pastures	The community has generations old practices for pasture use. In Gultari valley, the pastures are distributed among villages (hamlets) and each household has to graze their livestock in the designated pastures

Valley	Park natural resources	Customary practices
		only. Most of the locals have constructed shepherd huts in pastures where they reside during the summers. Villages have their own community pastures and they are distributed according to the villages, clans, or tribes. Usually the grazing period in alpine pasture is from June to August. There is also rotational system intact in using the pastures. The animals spend their time in different pastures in a year or the pastures get changed in next year. It is good practice which allows the grass to grow once it's free from the livestock. Community grows some fodder in their own lands for the livestock, apart from it they cut grasses from pastures during August and September and store it for the further fodder need in winters.
	Wildlife	The community has no set rules for hunting. However, community claims that since long no illegal hunting prevails in the area except fishing which is also done in a sustainable way without using net through angling and rods.
	Water	Water is an important natural resource for agriculture and livestock. The water is extracted from the nullahs through a main channel and the main channel is sub divided into various small channels, so that everyone should have access to it. The maintenance and cleaning of the water channel is carried out by the community on volunteer basis and there are set rules for it. Each household in Gultari community received water for one hour each day.
	Agriculture/ land use	The main use of private land in Gulteri valley is agriculture, fruit, and wood production from poplar plantation. The agriculture is subsistence mainly because of less arable land, lack of mechanization

Valley	Park natural resources	Customary practices
		and extreme weather. Apart from the private holdings, there are community lands, which are the lands whose allocation and use is decided under customary laws. It has been a customary rule that all segments of the community get equitable share in the rights related to common lands.
Shagartahng	Harvesting of forest and other natural vegetation	Apart from wood a good quantity of cow dung cake is used as a source of fuel. Mainly they use juniper for fuel as well as for home construction. According to the community responses they also bring wood from the forest or park area and also from their communal land from where they bring wood and also the poplar, willow and fruit plants wood in their own family land they use for timber and fuel wood.
	Medicinal Plants	Community harvests medicinal herbs and aromatic plants from pastures and buffer zone of the park for household purposes. Mostly uproot the whole plant. They use homemade medicines for the day to day medical issues, although, the government upgraded the local 'Hikmat' to a dispensary it can only take care of minor problems. If someone gets sick, the patient is brought down on a local stretcher on the feet, which takes nearly 6 to 8 hours. Many times, the patient dies on the way.
	Livestock rearing and grazing	The community of Shgar Thang take their animals to two Nullahas named as Mundair Nullah for the residents of Shagar Balla and both communities from 10th of June to 10th of December every year use Lajing Nullah for the residents of Shigar Pine and Dongharn area collectively. The productivity of livestock is very low due to low productive breeds and diseases which

Valley	Park natural resources	Customary practices
		very common. The rearing trend of milk animals like cows is increasing, but rearing trend if small ruminant including sheet and goat is decreasing.
	Pastures	The community use pastures for grazing, fuel wood and medicinal plants collection. The anthropogenic pressure and climate negative change impacts are evident on pastures.
	Butter production	One thing they are famous for the butter, which they store for years by burying it underground in their houses. They conserve it for years and only use it on social occasions as gifts. It is a matter of pride for them; the older it is, the more valuable it becomes. The locals believe it is full of nutrition and effective in asthma-related problems.
	Wildlife	Shagarthang valley is quite rich in wildlife resources, people are quite friendly to wildlife they do not hunt, and hunting is totally banned by the community.
	Water	No customary law on water distribution because they have abundant water. For both agriculture and domestic use, they fetch water from the near water stream.
	Agriculture and land use	The deprival of modern-day facilities also makes them strong. They feed themselves only what they grow. There is a subsistence agriculture production of barley and maize and also fruit production including apricots. According to locals, besides Apple, the valley produces over 70 kinds of Apricots. Unfortunately, 80% of the fruit is wasted as there is no proper connectivity between Shagarthang and the down country.

Valley	Park natural resources	Customary practices
Shilla	Harvesting of forest and other natural vegetation	Strict customary laws regarding harvesting wood from the forest and buffer zone area. Artemisia is commonly harvested for fuel wood. In Shilla valley animal dungs of domestic livestock, biomasses by the small agricultural patches and firewood from nearby upper region small forest are the main source of energy for domestic needs. While some household uses kerosene oil for lighting purposes.
	Medicinal Plants	Harvest medicinal plants in traditional ways, mostly uproot the whole plant.
	Livestock rearing & grazing	During the summer season, the people of Shilla take their cattle to Deosai and keep them there till the autumn season. The grazing season starts with spring and the start of agricultural activities. Normally residents of Shilla send their animals in start of June and bring them back in the first week of September every year.
	Pastures	Community use pastures for grazing, fuel wood collection and as well as extraction of medicinal plants. Pastures are not healthy as low grass productivity is evident because of over grazing the same pastures every year in summers and climate change negative impacts.
	Wildlife	Hunting is totally banned and have very strict rules regarding wildlife hunting
	Water	Water springs are protected.
	Agriculture/Land use	The main land use is agriculture but they are using the old style of cultivation and traditional crop varieties so they are not much productive.
Kharim	Harvesting of forest and other natural vegetation	The community collects firewood from their own community land, nallahs and from the forest reserves.

Valley	Park natural resources	Customary practices
	Medicinal Plants	The individuals involved in gathering and collecting are largely untrained regarding the pre-harvest and post-harvest treatment of the collected material. Mostly they remove the whole plants from the roots.
	Livestock rearing and grazing	Overall, the livestock-rearing trend has been declining from last few years because of less availability of fodder for livestock, lack of interest in the young generation, less economic returns from livestock and adaptation to alternate income sources.
	Pastures	Community use their own pasturelands which are healthy.
	Wildlife	Locals stated that they are the protectors of DNP wildlife and even they inform wildlife and park officials if they observe any violation, mainly the illegal fishing. Mr. Muzaffar from Das Kiran community told that even the Ibex come into their fields but they don't hunt them against send them back to the park area and the same is being done with brown bear despite the damages they are receiving from it. A lot of pheasants and snow partridges present but they don't hunt and they even don't allow to hunt. The red fox is quite common.

Appendix 4: Deosai National Park as a Globally Significant High-Altitude Wetlands Complex

A potential Ramsar Site

Preamble

In addition to being important from the point of view of rare alpine flora and habitat of the endangered Himalayan (Deosai) brown bear (*Ursus arctos isabellinus*), the Deosai plateau is also important as a high-altitude wetlands complex (lying above 3,000 m). Many wetland types are represented on the plateau and it is considered an excellent example of high-altitude wetland in Pakistan, indeed in the entire Himalayas-Karakoram-Hindukush mountain region. Research studies have been conducted on the biodiversity of Deosai by such eminent institutions as Cambridge University, Pakistan Museum of Natural History, University of the Free State, South Africa, Norwegian University of Life Sciences and the Himalayan Wildlife Foundation. However, very few of them have focused specifically on the biodiversity and socio-economic status of communities dependent on the wetlands of Deosai. One of the more comprehensive surveys in this regard was conducted by the Pakistan Wetlands Programme (PWP), a nation-wide seven-year initiative being implemented by WWF-Pakistan on behalf of the Ministry of Environment whose goal is the conservation of the country's significant wetlands and their associated biodiversity while alleviating poverty. The importance of Deosai as a wetland can be seen from a field observation that, out of the 20 natural inland wetlands types listed by the Ramsar Bureau (see www.ramsar.org for details) at least 10 types are represented on Deosai (*R. Garstang, PWP, pers. comm*). These wetlands types include glacial lakes, peat bogs, marshes, riverbank wetlands, permanent streams and creeks, seasonal streams and creeks, snowmelt ponds, seasonal pools and wet meadows. The most well-known wetland of them is Sheosar Lake, situated at an elevation of 4,100 m ASL. It is one of the oldest alpine lakes in Gilgit-Baltistan. In the local language (*Shina*), Sheosar means blind lake as its main source of water supply is apparently invisible, but it is speculated that underground springs and glacial water contribute substantially to the lake's water. The wetlands of Deosai provide an important habitat to many resident and migratory bird species which include common teal (*Anas crecca*), chukar (*Alectoris chukar*), fish hawk (*Pandion haliaetus*), grey heron (*Ardea cinerea*) and others. According to a detailed survey by PWP, a total of 45 bird species were observed at Sheosar Lake alone.1 However, on Deosai as a whole, more than 130 bird species have been recorded, most of them utilizing the numerous wetlands for feeding, breeding, wintering or migratory stopovers2. The Deosai plateau also supports a significant proportion of indigenous fishes such as the High-altitude loach (*Triplophysa stoliczkae*), Slate-colored snow-trout (*Diptychus maculatus*) and Fleshy-mouthed snow-trout (*Ptychbarbus conirostris*). In Pakistan the High-altitude loach is recorded only at Deosai where it is stable and breeding. The Slate-coloured snow trout is the dominant and most common fish species of Deosai. It is also found in western China and Nepal, but stable population exists only in Deosai. The mammals, besides the brown bear, are represented most prominently by the golden marmot (*Marmota caudata*), Tibetan red fox (*Vulpus vulpus montana*), Himalayan otter (*Lutra lutra)*, Tibetan wolf (*Canis lupis chanco*) and snow leopard (*Uncia uncia*), the last being in the mountains surrounding the plateau. In fact, most flora and fauna found on Deosai depend,

directly or indirectly, on its extensive area of wetlands. The indicator species of this region, the Deosai brown bear, would be hard pressed for survival without the nutritious resources provided by the wetlands. Therefore, it could be said that much of the biodiversity of Deosai plateau would not exist in this shape if the wetlands were to degrade or disappear from the area.

Issues related to wetlands

Many issues and threats faced by the Park as a whole are also impacting its wetlands. However, the following issues pertain specifically to wetlands. Some of them are considered to be a direct result of the growing population around the Park and improved access to the Park by both locals and outsiders.

- Low level of awareness among line departments and communities regarding wetlands and their importance. This has impeded scientific management of wetlands and needs to be rectified.
- Inadequate scientific surveys and research relating to wetlands by reputed research institutions has resulted in poor knowledge of the values and services of the Deosai wetlands.
- Solid waste generation in the Park, especially around camp sites along important wetlands including Sheosar Lake and Bara Pani, is another issue that needs attention. Easier access to the Park has resulted in greater influx of visitors. This has increased the amount of solid waste in the Park. Lack of awareness, care (or both) in most visitors means that much of the solid waste gets left behind and has to be collected and disposed of by the Park staff.
- Grazing in the Park by large number of goats, yaks and sheep with negative impacts on wetlands such as sediment runoff, eutrophication of wetlands and trampling of fragile wetlands flora. Some remoter pastures are not in a bad condition but overgrazing and trampling by livestock is causing deterioration in some regions. As in other parts of Gilgit-Baltistan free grazing system is practiced here and pressure on the pastures is substantial in which nomads from the plains are a major player.
- Inadequate Park resources for proper protection of the wetlands. The field staff of the Park struggle to manage tourism, solid waste and catch illegal hunters, yet paucity of resources means that these important functions cannot be properly executed.

Objectives of Wetlands Management in Deosai National Park

- Maintain and enhance ecological integrity of the wetlands of Deosai National Park
- Protect wetlands habitat against fragmentation, encroachment, pollution and other human interventions
- Promote research as a basis for management decisions

Operational Objectives

- Strengthen protection for the wetlands of the Park
- Enhance mass awareness and capacity building for line departments and custodian communities

- Ensure the utilization of wetland resources in a sustainable manner
- Develop linkages and partnerships for wetlands surveys, research and monitoring at DNP

Management Prescriptions

In order to achieve the operational objectives, the following prescriptive actions are recommended:

Operational Objective 1. Strengthen protection for the wetlands of the Park

Due to increased number of visits to the Park, the wetlands ecosystems are at a greater risk of being degraded with consequent loss of associated biodiversity. This needs greater attention and protection. The following measures are suggested to avert these risks.

- *Demarcate wetlands boundary and set up markings and information signs*

Clear demarcation of the wetland boundary is important for implementing management activities in the area. The area of water body and its immediate catchment should be demarcated in collaboration with concerned communities and line departments with help from GIS laboratory. This would include the following:

1. The functional zones of the wetland and functions of each zone should be identified. to establish core, buffer and outer zones.
2. Concerned departments carry out demarcation of the wetland boundaries in the presence of relevant NGOs and local CBO representatives.
3. Stones or trees should be used as boundary markers to define the area of the wetlands
4. Approximately 10 signboards (international protected areas symbols) with information on wetlands and their regulations should be erected at sites to facilitate visitors.

- *Strengthen the enforcement of wetland management regulations*

1. The watch and ward mechanism already prescribed in this plan should be used to report both legal and illegal activities in the wetland's areas and prompt action should be taken by the concerned government authority.
2. Cooperation with the public administration should be strengthened since they are crucial in law enforcement and hence in the successful implementation of the management plan.

Operational Objective 2. Enhance mass awareness and capacity building for line departments and custodian communities

- *Conduct public awareness activities in local communities*

Public awareness and education are important for successful management of wetlands and therefore are an integral component of this plan. The following measures will be considered:

1. Public awareness initiatives focused on wetlands biodiversity and resource conservation should be conducted in consultation with stakeholders. By arranging environmental awareness events in Skardu and in communities adjoining the Park, the

public will be educated about the negative impacts of solid waste, water pollution and overgrazing of the pastures.

2. Information boards and posters on the protection of wetlands should be erected along the wetland's boundaries, at strategic locations used by visitors and in local communities adjoining the Park.
3. Posters and banners regarding wetlands conservation should be placed in regional Polo festivals.
4. Articles and awareness programmes about wetlands in general and Deosai in particular should be included in local newspapers and radio from time to time in order to make people aware of wetland conservation issues.
5. Focused environmental awareness initiatives should be launched for the nomadic *Gujjars* who graze their livestock intensively in the Park so that the issue of over-grazing leading to surface run-off and sedimentation can be addressed.

- *Promote wetlands conservation awareness in local schools*

A few awareness raising school events in the vicinity of Deosai National Park have already been conducted by Pakistan Wetlands Programme and other projects of WWF-Pakistan. Activities focused specifically on all aspects of wetlands should be introduced in area schools as part of their environmental education. The following measures are recommended:

1. Training of school teachers in imparting environmental education in schools, with special emphasis on wetlands. This could include guidelines on how to establish and run Green Clubs which instill the spirit of nature conservation in students.
2. NGOs and Park management should jointly arrange lectures by both invited guests and local teachers, organize poster competitions and role plays among students where they represent different stakeholders, documentaries and small exhibitions on wetland biodiversity and sustainable use of resources, and other activities suggested by children and teachers. Community members should be invited to attend these activities from time to time in order to enhance the level of their awareness regarding wetlands resources and the services they are offering for their livelihoods in these remote areas.

- *Trainings for line departments and communities*

To enhance the capacity of the Forest and Fisheries departments and the local communities in managing the Deosai wetlands, the following capacity building measures should be undertaken:

1. Workshops, trainings and exposure visits for concerned line departments should be arranged from time to time which focus on various wetlands issues and management. The trainings should be conducted in the area itself or nominated persons could be sent to other regions for specialized trainings. Exposure visits should be conducted to observe successful examples of wetlands conservation elsewhere in the country.
2. Workshops for the custodian communities on subjects that would facilitate them in wetlands conservation should be carried out on a need basis. Subjects could range from pasture management to eco-tourism development and from income generation from medicinal plants to fishes.

Operational Objective 3. Ensure the utilization of wetland resources in a sustainable manner

This objective of wetlands management could be achieved through:

- *Promote controlled grazing*

The communities and the nomads should be sensitized about the need for controlled grazing in order to avoid further degradation of pastures and improve their floral diversity and biomass in order to support the wild fauna. The continued practice of this system should also be ensured. This could be achieved through:

1. Meetings with graziers to promote interest in practicing controlled grazing. This would include both the local communities and the seasonal nomads who exert a great pressure on the wetland's pastures of the Park, especially during the summer season.
2. Discuss different incentives with the graziers in order to create a positive environment for rotational grazing practices. One of them may be to allocate rehabilitated pastures to graziers in compensation for controlled pastures
3. After consultation with all stakeholders, design and implement a feasible rotational grazing system in the Park.
4. Form a committee comprising of local communities, graziers and Park staff to ensure the continued implementation of controlled grazing

- *Regulate point sources of land-based pollutants around the wetland*

The following actions should be taken in this regard:

1. In cooperation with the concerned line departments and other stakeholders the sources of all land-based pollutants should be positively identified for further research and management.
2. Camping sites should be removed from the banks of Sheosar Lake and Bara Pani to other suitable places within the Park. These can be identified in close consultation with Park staff and the camping professionals.
3. The immediate vicinity of Sheosar Lake and big streams of the Park should be closed to grazing through mutual agreement with the villagers
4. Visitors and tourists should be educated against throwing garbage into the lakes and streams and urinating beside the water bodies.
5. A number of garbage bins should be placed along the more frequented parts of the Park such as Bara Pani, Kala Pani and Sheosar Lake
6. During and at the end of summer season the Park management with the assistance of local communities should clean up pollutants and properly dispose them.

- *Develop wetlands eco-tourism in Deosai National Park*

Wetlands provide an interesting and unique resource to promote tourism, and particularly eco-tourism. Deosai National Park is visited by a number of national and international tourists every year, but so far, no concerted eco-tourism promotion efforts have been undertaken. Actions to achieve this initiative will include:

1. A carrying capacity analysis should be conducted to calculate how many visitors the Park's wetlands, both along the main route and those away from it, can accommodate in a given season.
2. Publicity material about the Park's wetlands should be placed at main urban centers like Gilgit and Skardu where it will be accessible to most potential tourists
3. Visitors should be facilitated in enjoying the wilderness of the Park, its unique biodiversity and the high-altitude wetlands. These may include, but not limited to, wild flora and fauna/avi-fauna viewing and hikes by installing proper information boards within the Park and indicating permissible routes. The sign and information boards should follow international protected areas symbols.
4. Tourist guides should be trained in eco-ethics for orienting tourists to the Park and its wetlands. In addition, local jeeps and drivers should also be made aware of the uniqueness of the region.

Operational Objective 4. Develop potential for wetlands research and monitoring at Deosai National Park

The best management is one which is based on sound scientific facts and figures, so that such research is essential for Deosai National Park management. There is great potential for surveys and research on topics related specifically to the variety of wetlands found at the Park. The need is to tap this potential through promoting wetlands at national and international levels and contribute to the proper management of these wetlands. This could be achieved in the following ways:

- *Invite universities and institutions to undertake research projects on wetland ecosystems of the Park*

Formal contacts in the form of MOUs should be established with universities and other research institutions in the country and abroad to conduct wetlands research in this region. The results should be shared with management and other stakeholders so that effective management options could be devised. The following areas of research are important and should be emphasized. However other areas may also be suggested.

1. Demarcation and boundary delineation of the wetlands of Deosai National Park
2. Quantification of ecological, social and economic benefits generated by the wetlands of Deosai
3. Study of water birds, both resident and migratory, that depend on Deosai wetlands. In addition, re-evaluate Deosai for Ramsar status.
4. The role of wetlands in the life cycles of fish found in the rivers and streams of Deosai
5. Detailed study of the food webs supported by Deosai wetlands
6. Study the peat lands of Deosai National Park
7. Development and utilization of medicinal plants found in or around the Deosai wetlands
8. Interaction between the brown bear, fish and other biota of the wetlands
9. Marketing potential of natural resources such as fish and medicinal plants by communities living adjacent to the Park

- *Establishment of an ecological monitoring programme*

Ecological monitoring of wetlands will provide up-to-date information about the status and quality of the environment and biodiversity within the area. Monitoring also helps the management to understand change and can be used to design and adjust management strategies to prevent degradation of wetlands and the species they support. Actions to be undertaken will include:

1. A comprehensive ecological monitoring programme should be designed in accordance with international standards. The following environmental factors should be included:
   a) Biodiversity: monitoring of floral species, their quantity, pastures biomass (outputs) and structure of the vegetation, birds (with an emphasis on water birds), insects, mammals, and reptiles.
   b) Chemical and physical environment: including water quality (pH, TDS, salinity, dissolved O2, total nitrogen, total phosphorus, selected heavy metals), changes in water level and weather factors (light, temperature, rainfall and unusual weather).
   c) Anthropogenic (socio-economic) conditions: including changes in the area of agricultural land, marginal forest and adjacent developments (livestock sheds), local population.
2. Biodiversity and anthropogenic monitoring will be conducted once every year, whereas water quality assessment will be conducted a number of times every year.
3. The following research methods will be adopted for monitoring:
   a) Fixed point monitoring: fixed ecological monitoring stations will make the data comparable and sequential.
   b) Fixed time monitoring: the parameters for measurement will be monitored in fixed time, so that the results obtained during a given monitoring are comparable with that of last monitoring.

Appendix 5: Infrastructure Development Plan for Deosai National Park

This plan provides an overview of the infrastructure available in the Deosai National Park, current constraints and gaps, recommended policy and principles for provision of infrastructure, the strategy for development of the infrastructure, and specific aspects of infrastructure that need to be developed. The scope of the plan includes the following:

1. Infrastructure to support visitors
2. Infrastructure to support park management

Overview of Available Infrastructure

Visitor Infrastructure

The map in **Exhibit 1** shows the location of the available infrastructure. The following is a description of the available infrastructure:

Roads and Tracks: Black top road currently extends from Skardu to about 23 km from the point of entry into the national park at Ali Malik, and about 13 km from Chilam to Chachore Top. The remaining tracks are dirt roads, across Deosai connecting Skardu to Astore, connecting to Murtaza Top onwards to Gultari, and through Bari La to Matiyal.

Hotels: Local owners are presently operating hotels at Ali Malik, Bara Pani, Kala Pani, and Sheosar Lake. All of these hotels provide very basic food and tent accommodation.

Toilets: Fiberglass toilets are all provided by the Department, generally two at each hotel location. Toilets at Bara Pani are commonly used by the Department staff and the visitors. The hotel operator at Sheosar provides a tent type toilet for visitors.

Camping Sites: Informal and unregulated camping sites are operating at Ali Malik, Bara Pani, Kala Pani, and Sheosar. The hotel operators allow the visitors to camp on their premises for a small fee, Rs 200 per tent at Bara Pani.

Park Management Infrastructure

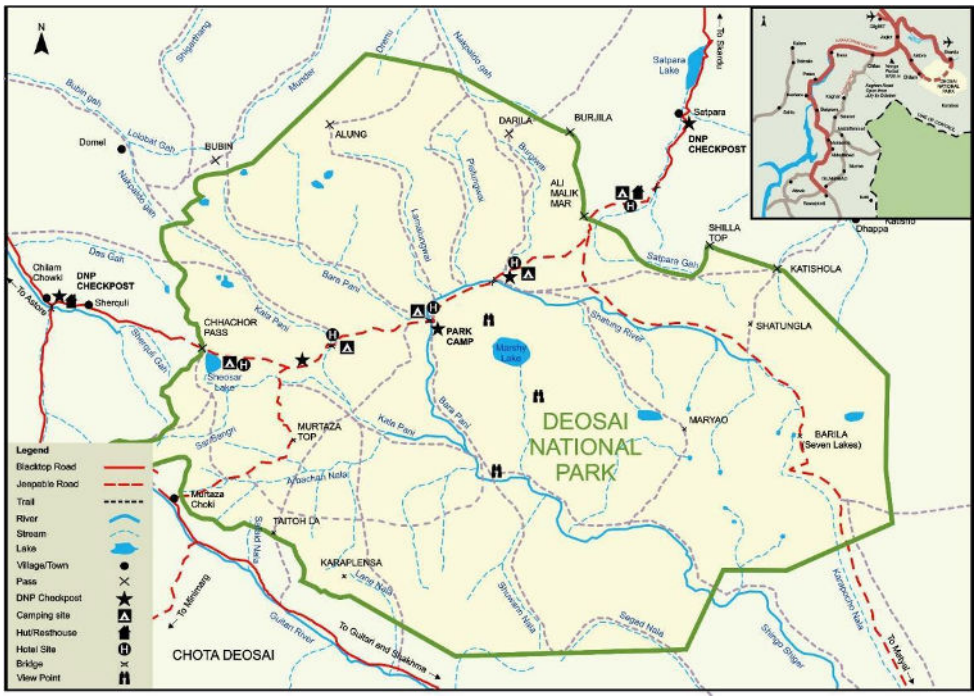
Main Park Office: The main park office is located in Skardu on Satpara Road.

Checkposts: Constructed checkposts exist at Satapra and Chilam.

Rest Houses: These are available at Skardu and Chilam.

Field Camps: Field posts consisting of tents and fiber glass igloos are being operated at Shatung, Bara Pani, and Kala Pani. The main field camp at Bara Pani has a masonry and concrete room constructed at the base of the hill.

Exhibit 1: Overview of Available Infrastructure of Deosai National



Current Constraints and Gaps

Roads and Tracks: The dirt tracks become difficult to negotiate in wet conditions. Secondary tracks are formed when the vehicles negotiate bypassing the existing tracks that develop deep ruts, resulting in habitat damage. Considerable dust is generated by the vehicles in dry weather conditions. The number of visitors is also curtailed as most visitors avoid bringing personal two-wheel vehicles up to the national park.

Hotels: With some exceptions, the conditions at the hotels are generally not clean and are unhygienic, including kitchens and tents accommodating visitors.

Toilets: Toilets are generally in disrepair and in poor condition. Toilet facilities for visitors are not available at the check posts.

Camping Sites: Without clear demarcation, the visitors tend to camp at will often disturbing areas which have previously not used for camping, and locating toilet tents close the rivers and streams thus potentially contaminating the flowing water.

Park Office: No office facilities are available in Astore due to which management of the western part of Deosai and liaison with the communities located there is weak.

Checkposts: These are adequate in terms of the buildings. However, water supply at the Satpara checkpost is a problem in the late season when the water in the stream from which the supply is taken of the check post dries out.

Rest Houses: Rest houses are currently constructed at Skardu and Chilam. These are adequate for the needs of the park staff and management.

Field Camps: Field camps facilities are adequate. Continuous replacement of tents and igloos will be required.

Recommended Policy and Strategy for Infrastructure

All infrastructure located within the national park will conform to the Zoning Plan included in the report 'Proposed Environmental management and Zoning Plan for Deosai National Park'. Recognizing the generally pristine and fragile nature of the national park habitats, HWF initially maintained a policy of 'no permanent structures' within the national park boundaries. The objective of this policy was to prevent mushrooming of commercial and government buildings that would degrade the landscape and habitats. With the Department now established in the national park and having some degree of control over new constructions, this approach can be reviewed and revised. Specific policies and guidelines are outlined below:

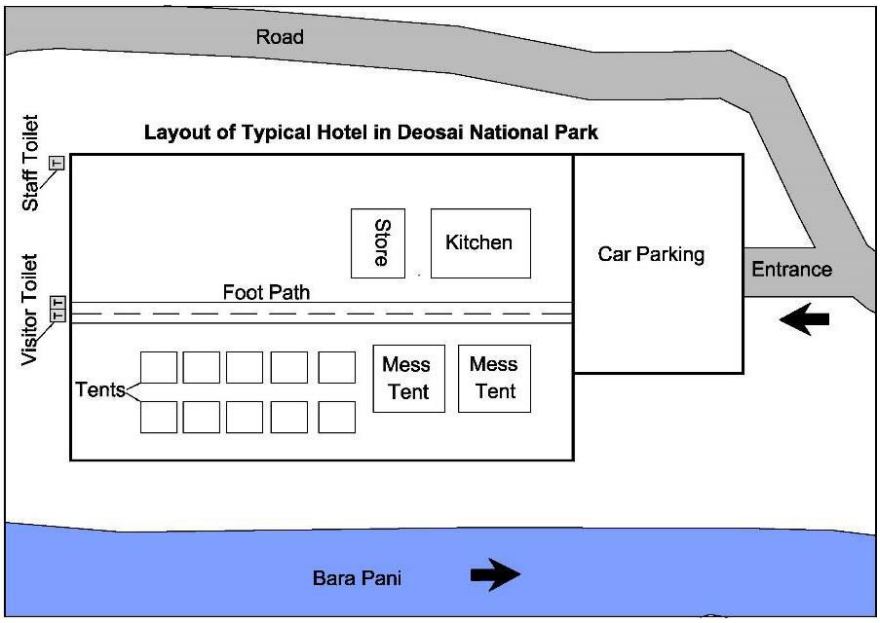
Visitor Infrastructure

Infrastructure should be developed to facilitate the visitors and to improve the quality of their experience and safety within the national park.

Roads and Tracks: Black top road should be extended over all high traffic corridors to make it possible for cars to safely traverse Deosai. This will reduce travel times and dust emissions, improve the safety and quality of experience for visitors, and protect the landscape from damage from use of multiple tracks by vehicles.

Hotels: Guidelines for facilities and operation of hotels have been included in the 'Environmental Zoning and Management Plan for Deosai National Park' submitted by HWF. Preparation of standard plans is recommended for the layout and facilities of the hotels. A draft layout for a hotel is included in **Exhibit 2**.

Exhibit 2: Layout of Typical Hotel in Deosai National Park

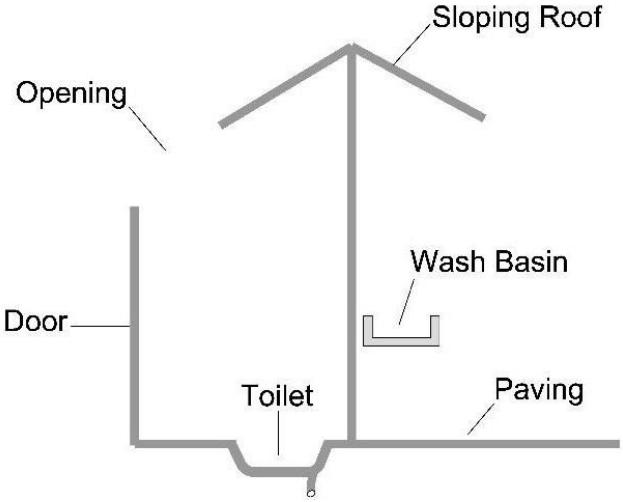


Toilets: The fiberglass toilets currently in use are not suitable for heavy use due to increase in the number of visitors. The fiberglass toilets need to be gradually replaced with cement-concrete construction to provide clean facilities for visitors. Adequate number of toilets should be constructed at all camping and hotel sites corresponding to visitor traffic. A draft layout of a toilet facility is included in **Exhibit 3**.

Camping Sites: Camping sites should follow standard layout plans and should be regulated though permits by the Department. A camping fee per tent of the order of Rs 100 per person per night is recommended. Toilet facilities and drinking water should be provided at all campsites. A draft layout of the camping facilities at Bara Pani is included in **Exhibit 4.**

Park Offices: An office of the DNP should be constructed at Astore from where the RFO – Astore can operate. Accommodation for the RFO should also be constructed attached to the office. This facility is essential if the western section and boundary of the national park and communities located on the west of the national park are to be given due attention.

Exhibit 3: Draft Layout of a Visitor Toilet Facility Side View



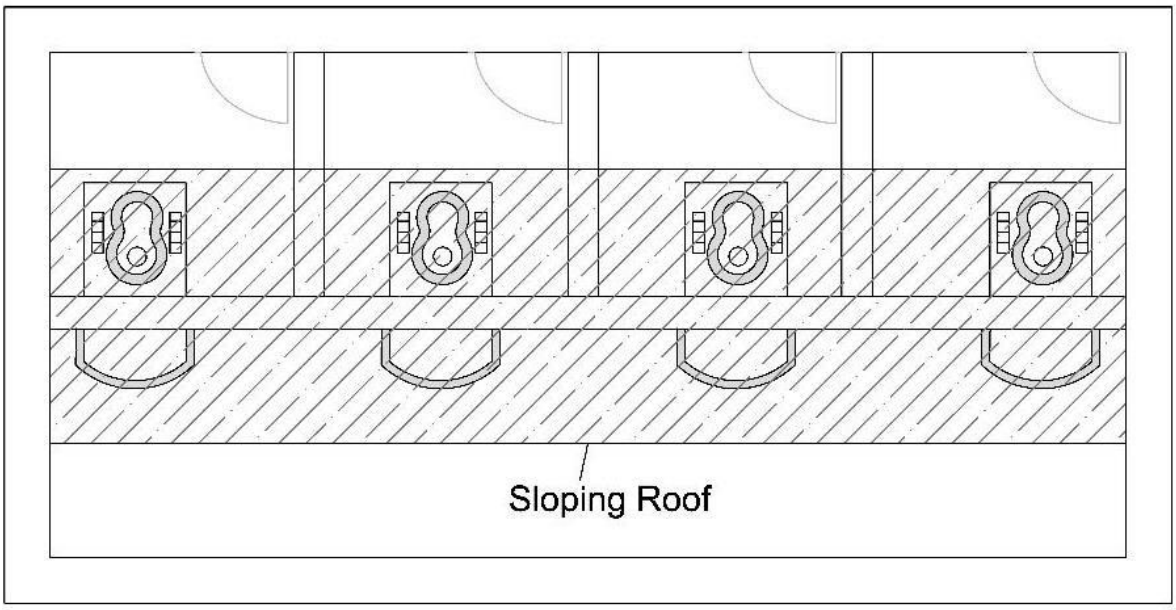
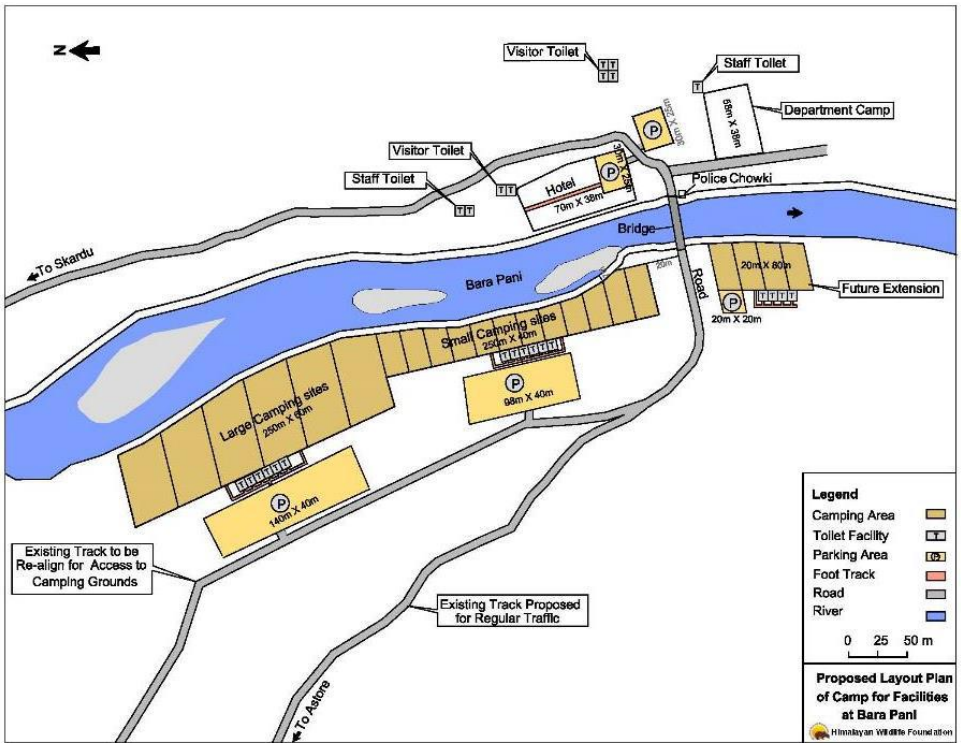


Exhibit 4: Draft Layout of the Camping Facilities at Bara Pani



Recommendations for Infrastructure

Recommendations for the infrastructure as discussed above are summarized in **Exhibit 5** below. This plan is recommended for the next five years, until 2020, after which the infrastructure policy should be reviewed and revised if necessary, to cater for emerging pressures and needs.

Exhibit 5: Summary of Infrastructure Recommended for Deosai National Park

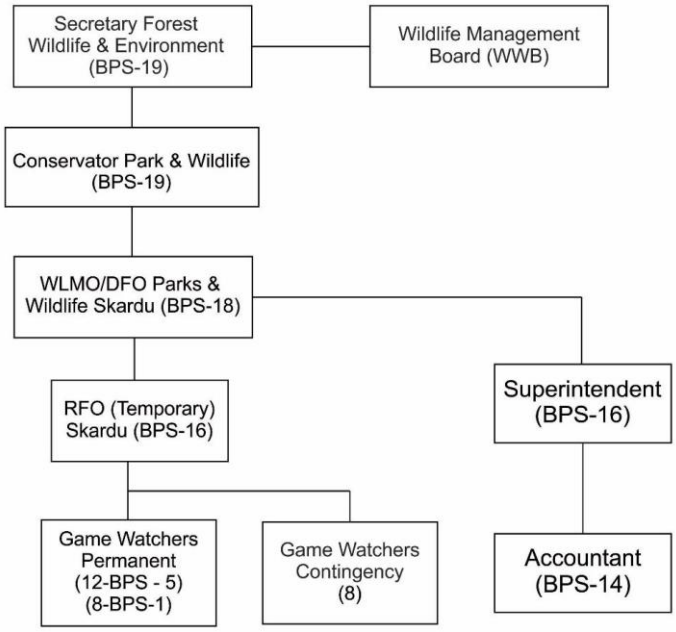
No.	*Description*	*Requirement*
1.	Access Road from Skardu to Astore	Remaining 45 km of dirt road in DNP to be made black top.
2.	DNP Office in Astore	Park office and attached accommodation for RFO.
3.	Permanent Toilet Facilities for Visitors	Required at all locations, Satpara Checkpost, Ali Malik, Shatung, Bara Pani, Kalapani, and Sheosar. Number of toilets at each location to correspond to the visitor traffic and to be increased accordingly.
4.	DNP Field Camps	All camp tents and igloos to be standardized and kept in good condition. No new permanent construction recommended.
5.	Hotels	Hotels layout to follow guidelines and layouts to be approved by the Department. Proper toilet facilities to be provided at all hotels, with fiberglass toilets gradually replaced by permanent constructions.
6.	Campsites	Standard layout to be marked at all campsites.
7.	Visitor Information Centre at Bara Pani	This should be housed in a high-quality secure tent with seating arrangement and multimedia equipment.

Appendix 6: Institutional Development Plan for Deosai National Park

Existing Administrative Structure

The existing administrative structure is shown in **Exhibit 1**.

Exhibit 1: Existing Administrative Structure for DNP



Issues and Gaps

In the context of overall constraints identified in the document 'A Rapid Assessment of State of Management in Deosai National Park' (Rapid Assessment Report) submitted by HWF in July 2015. Major gaps in the institutional strength and capacity are summarized below, in order of priority and significance:

Weak Presence of DNP Management in Astore

The communities in Astore perceive DNP as a Skardu driven effort, with the management and its offices placed in Skardu. In the background of territorial claims being made by the people in Astore on Deosai, the validity of those claims notwithstanding, absence of park management in Astore does not help in alleviating public perception of a bias in management in favour of Skardu. An office of DNP was proposed in the original PC-1 for the national park. It is not clear if this office was ever constructed. The original proposal also allowed for a BPS-17 officer in Astore.

Lack of Depth in Management Capacity

In the present set up, for all practical purposes, the DFO who heads the DNP office is directly supervising the wildlife guards, visiting communities, and frequently visiting DNP to inspect field operations. There is senior level support staff available in the park office in Skardu, but this staff does not perform any management functions. It is not possible for the DFO who has to give considerable attention to administrative matters including attending coordination

meetings in Gilgit to directly manage the park operations. Senior level supporting staff as originally envisaged in the PC-1 for the DNP is missing. These include, in addition to an office to be posted in Astore office of the DNP, dedicated Range Officers for Skardu and Astore that directly attend to the park operations and report to the DFO. The guards also need to be organized under Insepctors, which are presently missing. The administrative hierarchy and organization in the field camps is also not clear, and one gets the impression that all park staff is equally responsible.

Limited Capacity to Manage Increasing Number of Visitors

The number of visitors has increased significantly in the last few years. Annual increase is estimated at over 25%, and the trend is expected to continue. The pressure from the visitors in terms of littering, off road driving, illegal fishing, and camping in non-designated areas has increased correspondingly. A system of fines and penalties also needs to be put in place, as simple advice and persuasion as practiced so far is not likely to be effective in future. The existing staff spread over four filed camps is struggling to cope with this pressure and violations of park rules by the visitors are on the increase.

Limited Attention to Education and Awareness in Communities

The DFO has put a serious effort in 2015 in visiting the communities, meeting them, and discussing park management issues with them. Educational videos have already been developed by Walkabout Films, and a library of educational materials on Deosai has been prepared by the Department and HWF. This effort needs to be made regular and systematic, and ought to be conducted by the RFOs in their respective jurisdictions.

Very Limited Attention to Planning and Research

Core capacity for planning and research is missing, and this aspect has largely been left to HWF and other supporting NGOs to attend to. For a park as large as DNP, there is need for capacity to mainstream planning and research and integrate it into the regular working of the park office. This will also help in involving the park staff in planning and research activities, which will improve the effectiveness of the outcomes.

Very Limited Attention to Monitoring and Reporting

No system for collection of information, monitoring and reporting is in place. Periodic reports that asses the state of management and provide recommendations for improvement are missing. Occasional monitoring is carried out by HWF, an example of which is the Rapid Assessment Report.

Recommendations

Keeping in mind the emerging requirements for management, the proposed staffing requirements are tabulated in **Exhibit 2**, and illustrated in **Exhibit 3**. Salient features of the proposed staffing are summarized below

Exhibit 2: Existing Staffing, Proposed Positions, and Recommended Staffing

Position	*Grade*	*Existing*	*Proposed*	*Total Recommended*
WLMO/DFO Parks & Wildlife Skardu	BPS-18	1	-	**1**
SDFO - Astore	BPS-17	1	-	**1**
Superintendent	BPS-17	1	-	**-**
SDFO - Planning, Research, Monitoring	BPS - 17	1	**1**	-
Superintendent - Skardu	BPS-16	1	**1**	-
RFO - Park Management - Skardu	BPS-16	-	1	**1**
RFO - Park Management - Astore	BPS-16	1	**1**	-
Accountant - Skardu	BPS-14	-	1	**1**
Computer Operator - Skardu	BPS-16	-	1	**1**
UDC - Skardu and Astore	BPS-9	-	2	**2**
LDC - Skardu and Astore	BP-7	-	2	**2**
Game Inspector	BPS-7	-	6	**6**
Game Watcher	BPS-5	12	22	**34**
Contingency Game Watcher	BPS-1	8	-	**-**

Establishment of the DNP Office in Astore

An SDFO-Astore supported by an RFO-Astore along with other supporting staff is proposed to give due attention to the management of the western aspect of Deosai and maintaining relations with the communities in Astore and in villages located along the western boundary of the national such as Chilam, Das, Khiram, Bobind, and Dudgai.

Increasing Staff Strength to Meet Emerging Requirements

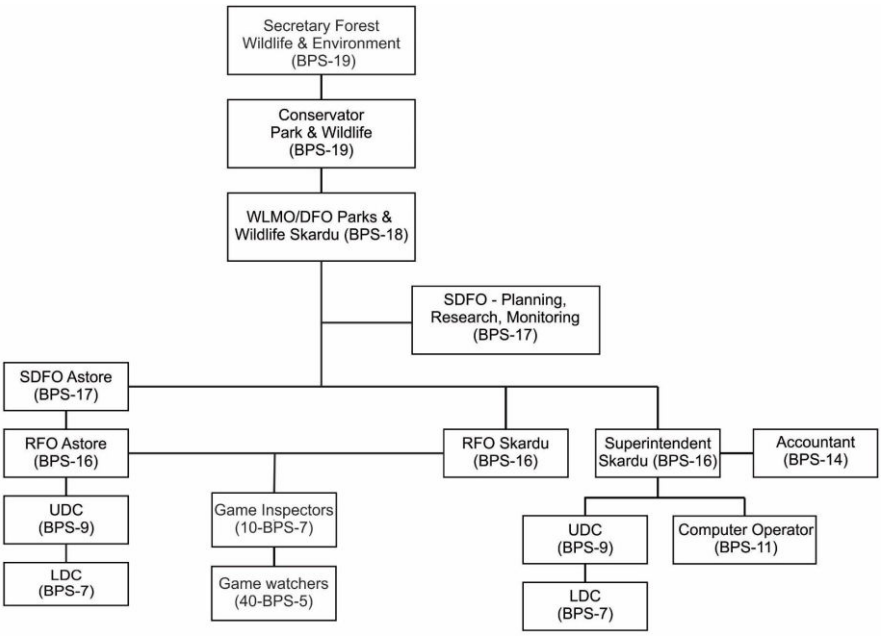
The following staff additional and adjustments are proposed, as shown in Exhibit 2:

- An SDFO in BPS-17 supported by an RFO in BPS 16 in Astore Office as discussed above.
- An SDFO Planning, Research, and Evaluation (SDFO PRE) is proposed to fulfill these functions. The SDFO will be responsible for designing the information collection and management system, periodic monitoring of performance of the park, preparing and

discussing the reports and results with park management, preparing plans and recommendations for improvement of management.

- A RFO is proposed to assist the DFO in management of the eastern part of DNP, inclusive of communities residing in the boundary of the national park.
- Seven positions of Game Inspectors in BPS-7 are proposed to supervise the Game watchers. Each of the check posts and field camps should have at least one Inspector present who should take the overall responsibility for supervision of the staff at each post or camp.
- The positions of game Watchers are proposed to be increased to 34 to manage the increasing traffic of visitors. Staff level at individual posts can be adjusted according the work load at the station.

Exhibit 3: Recommended Administrative Structure for DNP



1.3 System for Information Management

A system for information collection, complete with field forms, data entry using custom designed software, and preparation of standard periodic reports will be developed. Ares covered will include:

1. Visitor entry and traffic at check posts
2. Collection of park entry fee
3. Use of camping facilities and collection of revenues at camp grounds
4. Fishing permits and revenue collection
5. Recording of violations of park rules and fines imposed
6. Grievances and suggestions of visitors
7. Wildlife observations
8. Periodic wildlife census and sampling
9. DNP Management Board
10. Divisional Management Committees
11. Village Conservation Committees

Appendix 7: Monitoring and Evaluation for Deosai National Park

Monitoring and Evaluation

This section provides the scope and framework for monitoring and evaluation to determine if the objectives of the Management Plan are being achieved. This section also outlines the related institutional arrangements, procedures for reporting and review, and budgetary requirements. The monitoring and evaluation framework presented in this section should be considered as an evolving document. The PMC will be expected to review the framework before initiating the activities, and periodically review and improve it as experience is gained in implementation of the Management Plan. The Department will be responsible for finalizing data collection forms and protocols, and developing information management systems to support the compilation of data and preparation of reports. An Independent Monitoring Agency (IMA) as is proposed to conduct periodic field surveys to independently verify the extent and effectiveness of implementation of the Management Plan. The reports prepared by IMA will be publicly disclosed and reviewed by the Management Committee at least once a year, and by the Wildlife Management Board as and when scheduled.

Overall Monitoring Framework

A Pressure-State-Response framework as illustrated in **Exhibit 1** will be used for monitoring purposes1. The PSR framework lays out the basic relationships amongst:

- the pressures human society puts on the environment[2] the resulting state or condition of the environment, and
- the response of society to these conditions to ease or prevent negative impacts resulting from the pressures

Indicators of Pressure

This section addresses the monitoring of indicators of pressure, defined as the pressures that the human society puts on the environment. Indicators for Monitoring

[2] Pressure-State-Response Framework and Environmental Indicators, http://www.fao.org/ag/againfo/programmes/en/lead/toolbox/refer/envindi.htm

Exhibit 1: Pressure-State-Response

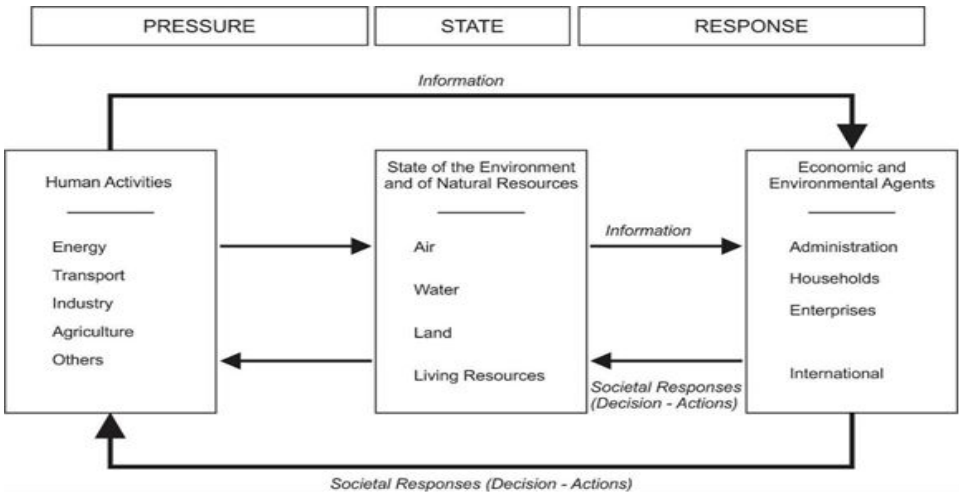


Exhibit 2: Pressure Indicators

Aspect or Driver	Pressure	Justification for Indicator	Indicator Description	Comments
Recreation and Tourism	Permitted fishing using rods	Permitted fishing using rods	Permitted fishing using rods	Permitted fishing using rods
	Permitted fishing has been allowed with the assumption that it will contribute to betterment of the park. Fishing will reduce population of fish species and could negatively affect betterment of the park.	Permitted fishing has been allowed with the assumption that it will contribute to betterment of the park. Fishing will reduce population of fish species and could negatively affect betterment of the park.	Permitted fishing has been allowed with the assumption that it will contribute to betterment of the park. Fishing will reduce population of fish species and could negatively affect betterment of the park.	Permitted fishing has been allowed with the assumption that it will contribute to betterment of the park. Fishing will reduce population of fish species and could negatively affect betterment of the park.
Protection of livestock and security	Community assets damaged by bears		Number of livestock kills reported Number of incidences of crop damage reported	Livestock kills will be verified through an established forensic procedure

Aspect or Driver	Pressure	Justification for Indicator	Indicator Description	Comments
Shooting, trapping and killing of wildlife for harvesting of animal products	Hunting/killing of bears	One of the main reasons for setting up the DNP was to protect the remining population of this species in the region.	Number of instances reported and verified	Bear kills will be verified through an established forensic procedure
Shooting, trapping and killing of wildlife for other reasons	Disturbance or harm to other wildlife	There are number of other species of mammals and birds in Deosai that need protection. (See Section 4 and 7 of Baseline.)	Number of instances reported related to other animals including marmots and falcons	Kills can consist of accidents with vehicles, or recreational shooting by visitors
Hydropower	Construction of hydropower related facilities in Deosai	Damming of Shatung Nala to increase water supply to Satpara Dam has been under consideration	Plans prepared by WAPDA Plans approved by the government	
Tourism	Impact of visitors on land use and ecosystem	Visitors and related traffic impact water quality, available habitats for wildlife, and cause disturbance to natural habitats and wildlife	Number of visitors in a year Number of vehicles entering the park	
Land use pattern	Extent of built up area	Extent of built up area indicates the loss of habitat New roads and tracks expose additional areas to disturbance and change land use patterns	Number of permanent buildings constructed Length of new tracks constructed	
	Grazing by Gujjar Bakarwals	Grazing degrades natural habitats, takes away habitat from wildlife, and caused disturbance to wildlife	Area grazed by Gujjar Bakarwals Extent of grazed area located in prohibited zones Number of animals brought in for grazing Number of Gujjar Bakarwal households staying in the park	

Method for Data Collection, Frequency, and Timing

Exhibit 3 summarizes the methods of data collection, and frequency, and timing of data collection for the pressure indicators. Data will be collected through the following instruments and sources of information:

- An information system for park management to be maintained by Department; this information system will provide data on use of park resources, violation of wildlife rules and regulations, fines, and harvesting permits issued.
- Primary data collection by the Independent Monitoring Agency through interviews and surveys in selected villages and in national park.

Exhibit 3: Method of Data Collection for Pressure Indicators, Frequency and Timing

No	Pressure	Indicator Description	Method of Data Collection	Frequency and Timing
1.	Permitted fishing using rods	Number of fishing permits issued in a year	Compilation from the records of the Department	Once a year at the end of the fishing season
	Illegal fishing	Number of instances of illegal fishing reported	Compilation from the records of the Department	Once a year at the end
		Number of instances of illegal fishing observed	Visual scan by a team of at least two persons through the entire length of the main rivers such as Shatung, Bara Pani, and Kala Pani. Scan will be conducted by IMA at times indicated by patterns of occurrence	Twice a year in the season
2.	Community assets damaged by bears	Number of livestock kills reported Number of incidences of crop damage reported	Compilation from the records of the Department and interviews with key informers in communities	Twice a year, in May and in November
3.	Hunting/killing of bears	Number of instances reported and verified	Compilation from the records of the Department and interviews with key informers in communities	Once a year in May
4.	Disturbance or harm to other wildlife	Number of instances reported related to other animals	Compilation from the records of the Department and interviews with key	Once a year towards the end of the season

No	Pressure	Indicator Description	Method of Data Collection	Frequency and Timing
		including marmots and falcons	informers in communities	
5.	Permitted fishing using rods	Number of fishing permits issued for rods in a year	Compilation from the records of the Department	Once a year at the end of the season
6.	Construction of hydropower related facilities in Deosai	Plans prepared by WAPDA Plans approved by the government	Interview/contact with WAPDA and Ministry of Water and Power	Once a year at the end of the season
7.	Impacts of visitors on land use and ecosystem	Number of visitors in a year	Compilation from the records of the Department	Once a year at the end of the season
		Number of vehicles entering the park	Compilation from the records of the Department	Once a year at the end of the season
8.	Extent of built up area	Number of permanent buildings constructed	Report by Department	Once a year at the end of the season
		Length of new tracks constrcuted	Report by Department	Once a year at the end of the season
9.	Grazing by Gujjar Bakarwals	Area grazed by Gujjar Bakarwals	Survey by IMA	Once a year in August
		Extent of grazed area located in prohibited zones	Survey by IMA	Once a year in August
		Number of animals brought in for grazing	Survey by IMA	Once a year in August
		Number of Gujjar Bakarwal households staying in the park	Survey by IMA	Once a year in August

Data Analysis and Reporting

Formats for analysis and reporting of data on annual basis is included in **Exhibit 4**. The report will be prepared by the IMA with data collected by itself combined with that reported by the Department, after conducting due diligence and verification.

Exhibit 4: Format for Annual Report for Pressure Indicators

	Indicator	This Year	Previous Year	Percentage Increase or Decrease
1.				
2.				
3.				
4.				
5.				

6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

8.1.1 Targets

Explicit targets for pressure indicators cannot be set at this stage. These targets are best defined by the Management Committee on annual review as these will involve an element of judgment and consultation among stakeholders that are represented in the Management Committee, as illustrated below:

1. The number of fishing permits issued every year will depend on the outcomes of previous year including success in management and enforcement of fishing rules, income from permits, and change in fish populations observed.
2. Targets for reduction in violations of wildlife rules such as illegal fishing and hunting of other wildlife can be set by the Management Committee in view of level of pressures and resources being allocated to control the pressures. A 10-20% reduction in these pressures compared to those in the baseline or previous year would be warranted to improve the state of the national park.
3. Additional hydropower projects in the national park will be governed by the policy of 'subject to betterment of national park' as already specified in the legislation. The purpose of continuous monitoring of the stage of development of these projects is to alert the Management Committee of expected developments so timely actions can be taken to ensure uniform application of the policy.
4. Tourism and land use indicators are proxy indicators for degradation of water and habitat quality in the national park. The changes in these indicators will trigger policy level actions such as zoning of land use, and waste management.

Indicators of State

The objective of monitoring is to detect changes in the ecological integrity of the DNP by collecting and analyzing data for the following ecological indicators of state:

- Brown Bear: An estimate of the total population of the Brown Bear;
- Marmots: An estimate of the population of the marmots;
- Fish: the relative abundance, distribution, species composition and estimated population of the fish species;

- Macro-invertebrates: the abundance, distribution and species composition of aquatic macro-invertebrates at selected locations as these contribute to biodiversity and provide food for fish
- Terrestrial vegetation: the abundance, species composition, distribution of the terrestrial vegetation

The reasons for selection of these indicators is outlined below.

- Brown Bear: The Brown Bear is the flagship species of the DNP. The most stable population of the Brown Bears *Ursus arctos* in northern Pakistan, Afghanistan, and India is present in the Deosai National Park in the Deosai Plains.
- Marmots: The Golden Marmot *Marmota caudata* is one of the most prominent small mammal species of the DNP and an important constituent of the diet of the Brown Bears.
- Fish: Fish are important components of river ecosystems because they are long-lived and integral to aquatic food webs. They are considered key indicators of environmental change because of their varied life history strategies and their sensitivity to a wide range of hydrologic and water quality conditions.
- Macro-invertebrates: Benthic macro-invertebrates are an important part of the food chain in aquatic ecosystems, especially for fish.
- Terrestrial Vegetation: The vegetation cover and diversity provide an indication of the state of habitat and habitat degradation

The monitoring program describes for each indicator of state:

- Monitoring schedule and locations
- Method for data collection and sampling protocols
- Data analysis

Considerable effort will be expended to ensure that sampling conditions are as similar as possible among years because results vary with time of day, time of year, temperature, weather, habitat type and in case of aquatic sampling, difference in flow and water clarity. Comparisons among data collected at periodic intervals will be more meaningful if consistency is maintained and sampling procedures and proper quality control is exercised through all stages of data collection. It is also important to use the same sampling sites each year. All sampling sites will therefore be geo-referenced, photographed and marked in the field to allow the same location to be used repeatedly across years.

Brown Bear

The Brown Bear species present in Pakistan is the Himalayan Brown Bear U*rsus arctos isabellinus* (see **Section 5** of Ecological Baseline).

Objective

To determine change in the total estimated population of Brown Bears

Indicators for Monitoring

- Total population of Brown Bear
- Demographic parameters (male, female, sub adults and cubs of year) of Brown Bear

Sampling Frequency, Timing and Location

One survey will be conducted every year in DNP and surrounding valleys, in late September when the Gujjar-Bakarwals and local communities grazing livestock in Deosai have left, and the bears move to lower elevations as the temperatures drop. The proposed survey blocks for Brown Bear survey are given in **Exhibit 5** and Brown Bear census sheet is given in the **Exhibit 6.**

Brown Bear Survey Methodology

Double Observer method will be used in to estimate population of Himalayan Brown Bear *Ursus arctos isabellinus* in DNP and surrounding valleys. The area will be divided into survey blocks based on the water catchments in the national park (**Exhibit 5**). The size of each block will be such that it can be easily surveyed in a single day. Two observers will survey each block by walking along a predetermined trail and scanning the surrounding areas using a pair of binoculars from predetermined points. The second observer will start the survey 60 min after the first and follow the same method of observation. This protocol for Double Observer Method minimizes the chances of error and precludes any visual cue that an observer could provide unintentionally.

Each observer will record his observations including the number of Brown Bears observed, whether the bears were seen alone or in a group, as well as the gender, size, color, and morphological features of each bear observed. The GPS coordinates and the habitat at each bear observation location will be noted.

At the end of the survey, the two observers will compare the information gathered to determine the number of Brown Bears present in that particular survey block. The total estimated population of the Brown bears will be compiled by adding the number of bears observed in all the survey blocks.

Method for Data Analysis

The estimated population of Brown Bears obtained from the survey will be compared with information from previous years to determine the trend i.e. whether increasing or decreasing.

Exhibit 5: Proposed survey blocs for Brown bear and Marmot surveys

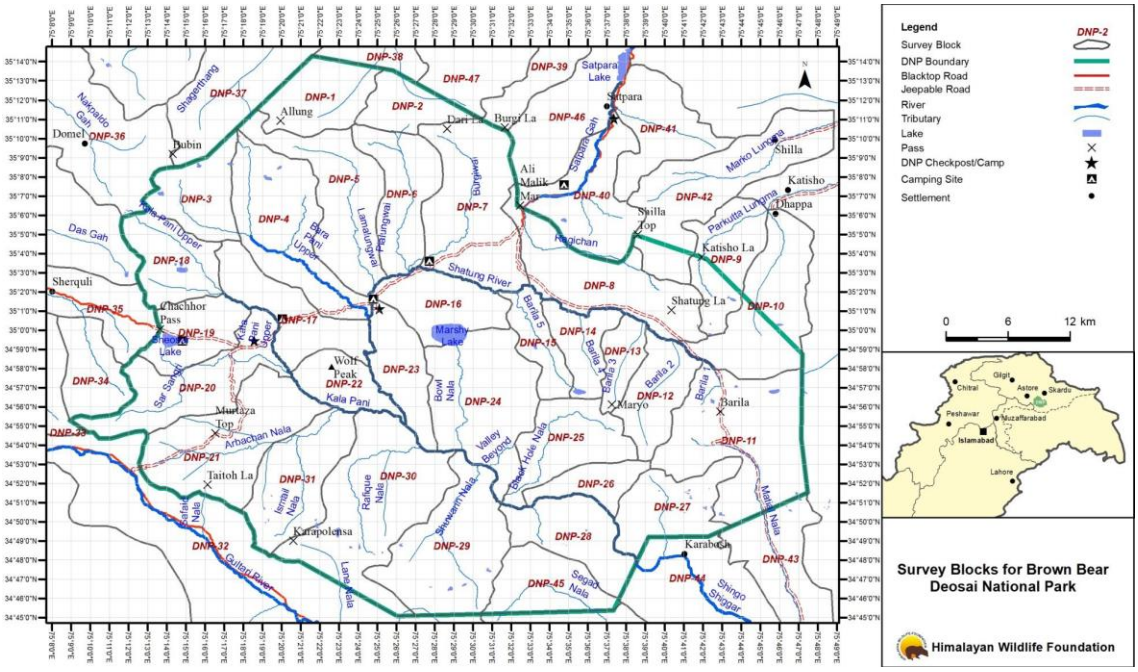


Exhibit 6: Survey form-Brown Bear

ID	W P	Observer(s)
Date	Start Time	End Time
[dd/mm/yy]	[HH:MM]	[HH:MM]

Starting Coordinates		**End Coordinates**
Latitude	N	N
Longitude	E	E
[Deg Min Sec]		[Deg Min Sec]

Habitat	☐ Marshy ☐ Grassy ☐ Stony ☐ Rocky ☐ Snow ☐ Other _____	Survey Block
(Please select only one box for Habitat)		

No.	**Number of Bears observed**	**Distance* (m)**	**Size (Small, Medium or Large)**	**Gender (Male, Female, Cub, Coy or Unidentified)**	**Identifying Marks or Features**

Golden Marmot Objectives

The main objective of this study is:

- to determine changes in the average population of the marmots in DNP.

Indicators for Monitoring

Total estimated population of Golden Marmots.

Sampling Frequency, Timing and Location

One annual survey will be conducted in the month of September. The proposed survey blocks will be the same as used for the Brown Bears and are given in **Exhibit 5.** The Marmot survey form is given in **Exhibit 7.**

Sampling methodology

The DNP will be divided into survey blocks on the basis of watersheds (**Exhibit 5**). The marmot sampling methodology is outlined below.

1. Golden marmot colonies will be monitored visually to estimate average number of individuals per colony (A) in each survey block.
2. Line transect will be placed to estimate density of marmot colonies in each survey block (B).

Line transects are one of the best ways to estimate density of wildlife populations over large areas.8 One sampling location will be chosen randomly in each survey block and survey will be repeated at that location each year. During the survey, observers will walk in a straight line 1 km long and observe marmot colonies within 25 m on each side of this line (total width of transect 50 m). The total number of colonies observed in the transect and the GPS coordinates of the sampling location will be noted. In addition, the terrestrial habitat at each sampling location will be noted.

3. Golden Marmot abundance in each survey block will be estimated by multiplying A and B.
4. The total estimated population of the Golden Marmot will be calculated by adding the marmot abundance observed in each survey block.

Method for Data Analysis

The estimated population of Golden Marmot will be compared with information from previous years to determine the trend i.e. whether increasing or decreasing.

Exhibit 7: survey form- Golden Marmot

ID		W P		Observer(s)		
Date			Start Time		End Time	
	[dd/mm/yy]			[HH:MM]		[HH:MM]
	Starting Coordinates			**End Coordinates**		
Latitude			N			N

Longitude		E			E
	[Deg Min Sec]		[Deg Min Sec]		
Habitat	☐ Marshy ☐ Grassy Rocky Snow		Stony Other _____	Survey Block	
	(Please select only one box for Habitat)				

No.	Number of colonies observed	Distance* (m)	Average number of individuals per colony

Fish

Objective and Rationale

- The objectives of fish component of the monitoring program are to routinely measure a set of pre-defined indicators that will:
- detect trends in fish populations;
- detect shifts in the community structure; identify any loss of biodiversity**;**

Indicators for Monitoring

The fish indicators that will be used for monitoring are:

- Fish Community Composition and population size structure

Relative abundance (catch per unit effort) of individual fish species with a particular focus on the following indicator fish species:

- Indus Snow Trout Ptychobarbus conirostris
- Tibetan Snow Trout *Diptychus maculatus*
- Tibetan Stone Loach, Triplophysa stoliczkae
- Species Diversity;
- Population estimate of Indus Snow Trout *Ptychobarbus conirostris* and Tibetan Snow Trout *Diptychus maculatus*

Sampling Frequency, Timing and Location

One fish survey will be carried out annually in the month of July.

The fish monitoring locations are shown in **Exhibit 11** and the fish survey form is given in **Exhibit 12.**

Methodology

Fish Collection Method

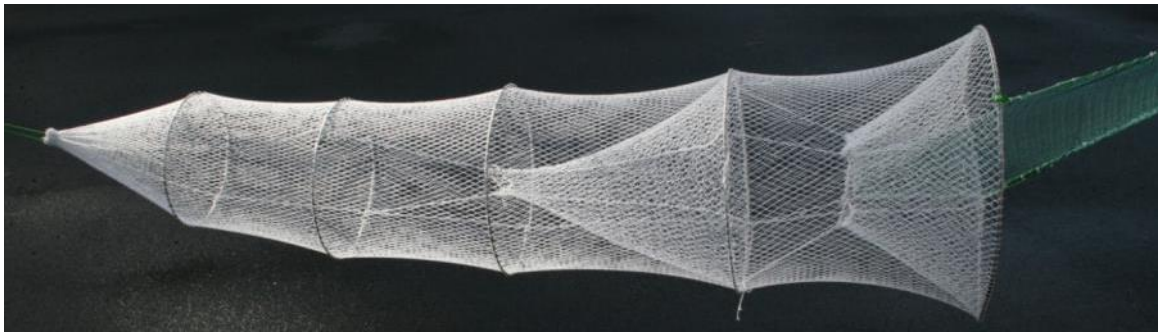
Fyke nets method will be used to collect the fish during this survey. Fyke netting is a useful method for sampling fish and is commonly used to monitor the yearly changes in fish species abundances in rivers and lakes. Fyke nets induce less stress on captured fish than do entanglement gears, and most captured fish can be released unharmed. Fyke nets are widely used in the assessment of fisheries stocks due to the low mortality of fish and size selectivity aspects.

Fyke nets trap fish inside mesh enclosures. The fish enter through constrictions, referred to as tunnels or funnels or throats. In Fyke nets, the mesh is supported by rigid frames or hoops. These frames are usually made of aluminum tubing. The tunnels are cones of mesh that are attached to a pair of hoops, so that when the net is set and the hoops are separated the narrow end of the tunnel points to the rear. Usually there are two tunnels per net. The hoops can be held apart by spreader bars that are attached to the hoops, or by stretching the net between fixed points. The net is set so that the leads intercept moving fish. When the fish try to get around the lead, they swim into the enclosure. Leads and wings are held in place by poles or anchors. Fyke nets should be set in the evening or late afternoon and be retrieved the next morning. All nets should be checked and emptied 12 to 24 hours after setting.

In the fish monitoring surveys, the Fyke nets will be set at specified locations (**Exhibit 8**) in the evening and emptied the next morning. The GPS co-ordinates will be recorded and the time of setting and removal of the nets will be noted. The specimens collected from each sampling point will be collected in a bucket, and will be photographed and identified in the field. Number of specimens of each fish species will be counted and then released. The specimens will be weighed and the body length noted. The voucher specimens will be preserved in 10% formaldehyde solution in the field. All the specimen data and the relevant auxiliary information will be recorded in the data sheet specially designed for these studies **Exhibit 12.**

A photograph of Fyke nets is given in **Exhibit 8.**

Exhibit 8: Photograph of Fyke Nets



Electrofishing

Electrofishing uses electricity to stun fish before they are caught. Electrofishing is a common scientific survey method used to sample fish populations to determine abundance, density, and species composition. When performed correctly, electrofishing results in no permanent harm to fish, which return to their natural state in as little as two minutes after being stunned.

During the fish monitoring surveys, electrofishing will be employed for sampling where water levels are low and wading is possible. It is proposed that the LR-24 be used for electrofishing.

Mark and Recapture Method of Population Estimation (Optional)

Estimates of the total number of fish in sections of streams or rivers can be made reliably using the mark-and-recapture method. In the mark-recapture method, a known number of individuals are marked in some way and released into the population at large. The population is then re-sampled and the population size is estimated from the ratio of marked to unmarked individuals. This method is optional and may be used to estimate the population of two fish species in the DNP, the *Ptychobarbus conirostris* and *Diptychus maculatus*

The mark-and recapture method requires the following conditions:

- Marked and unmarked fish have the same mortality rates.
- Marked and unmarked fish are equally vulnerable to capture.
- Marks are retained during the sampling period and all marks on recaptured fish are recognized.
- Marked fish randomly mix with unmarked fish.
- There is negligible emigration or immigration during the recapture period.
- The general process for estimating a fish population using the mark-and-recapture method entails:
- Collecting a sample of fish of the target species from a discrete section of stream during an initial "marking run";
- Giving fish identifying marks, such as a tag or temporary fin clip; Tabulating data by species and size
- Releasing fish in good condition back into the same area;
- Allowing at least 1 day for marked fish to recover and become mixed in the population;
- Collecting a random sample of fish during a subsequent "recapture run";
- Noting the ratio of marked to unmarked fish by species and size
- Calculating for each combination of species and size group an estimate of abundance by a Petersen equation (see details below)**;**
- Summing the size group estimates by species to obtain an estimate of the total population within the size range actually sampled.

If this method is emplyed to estimate the population, only two fish species, the *Ptychobarbus conirostris* and *Diptychus maculatus* will be 'marked and re-captured' during the July surveys of the DNP. These two fish species will be collected from each monitoring location (**Exhibit 11)** using Fyke nets, and tagged (marked) as described below. The fish will then be released back in the water at the same location to allow mixing of these marked fish with the rest of the population. Re-sampling at the same location will be done 24 hours after the marking to recapture the marked individuals. The ratio of the marked to unmarked fish by species and size will be noted and the Peterson equation will be

used to estimate the population of each of the two fish species (*Ptychobarbus conirostris* and *Diptychus maculatus)* at each monitoring location.

Tagging

The need to identify individual fish or groups of fish has been a basic requirement in fisheries science for many years. This has led to the development of a myriad of tag (defined as man-made objects attached to a fish) and mark (defined as identifiable characteristics, either natural or applied to a fish) types, generally referred to as ID-tags. Applications depend on the purpose of the exercise, the species and size of the individual fish, or the number of identified individuals required for the study.

There are many techniques available, but for the fish monitoring surveys in the DNP, Visible Implant Fluorescent Elastomers will be used to tag and mark the fish species.

Marks will be placed sub-cutaneously on fish using a Visible Implant Fluorescent Elastomers (VIEs). Elastomers were developed to combine the advantages of external marks with those of the internal marks and are used where minimal disturbance of the fish is required. The marks consist of colored and/or fluorescent plastic paint. They may be placed at a suitable location on the fish's body such as between the fin rays or at the base of the fins. The use of elastomers has been evaluated by Godin *et al*. (1996) and Morgan & Paveley (1996).

To inject a tag, the syringe needle is inserted into the marking location, and is slowly withdrawn as the material is injected, so that a long narrow mark is created. It is important that the tag created is fully contained within the target tissue; extrusion of the material from the needle must cease before the needle is withdrawn so that material does not project through the needle wound, as this is likely to cause rapid loss of the tag. In transparent tissue the VIE tag can be injected fairly deeply. However, if the material is being injected into fully or partly pigmented tissue it is important to place it just beneath the skin. Frederick (1997), and Olsen and Vollestad (2001) describe achieving maximum detectability by making sure that the syringe needle was pushed back towards the surface of the skin after the initial penetration.

The VIE is available in six fluorescent and four non-fluorescent colors. The fluorescent colors are highly visible under ambient light and provide the option of greatly enhanced tag detection when fluoresced with the VI light. Therefore, the marked individuals can be easily distinguished from the unmarked individuals during the 'recapture' run of sampling.

Available Fish Habitat

Google Earth images will initially be used to note the aquatic habitats in the river and tributaries. During the field surveys, this information will be verified by a rapid visual assessment of the sampled areas. The aquatic river habitats at each fish monitoring location will be classified based on the categories given in **Exhibit 9**. The substratum size will be noted and classified based on the categories given in **Exhibit 10**. This classification aids in the estimation of the proportion and size of the bed particles available to fish to use for hydraulics and predation cover, or for reproduction.

Exhibit 9: Morphological Units for Aquatic Habitats

Category	*Description*
Pool	Deep (>1 m), current speed is barely detectable, little or no disturbance to the surface of the water
Riffle	Fast shallow water, bed particles usually protruding through the surface of the water, trickling flow and small broken standing waves.
Run	Deep (>0.5 m) fast flowing, little or no disturbances on the surface of the water.
Rapid	Deep (>1 m), fast flowing water, disturbances on the surface of the water, large broken standing waves evident.

Exhibit 10: Substratum Size Classes

Category	*Size*	*Description*
Silt/Sand	<0.063-2	Mud to course grit
Gravel	2-64	Finger nail to length of small finger
Small Cobble	64-128	Wrist to halfway along finger
Large Cobble	128-256	Elbow to wrist
Boulder	>256	> Armpit to wrist
Bedrock	–	Slabs of rock

Method for Data Analysis

The following method for data analysis will be used:

Fish Community Composition

The annual survey of fish will produce a list of species at each sampling location plus related information such as relative abundance (Catch Per Unit Effort), fish size and fish population structure which will be used to determine whether species are being lost from the system; whether populations are declining or increasing.

Species Diversity

The species diversity at a site will be assessed using

- Species Richness (S): total number of species
- Shannon-Weiner Diversity Index (H')
- Species Evenness Index (E)

Species Diversity includes both species richness (number of species) and evenness (relative abundance of the different specie). The Shannon-Weiner Diversity Index (H') provides an indication of how evenly a species is distributed through a community, i.e. the relative proportions of rare and common species. Thus, although a community may have a high number of species (species

richness), if it is numerically dominated by a single species, H' will be low. Communities with a large number of species that are evenly distributed are the most diverse and communities with few species that are dominated by one species are the least diverse.

H', however, increases with increasing number of species. Therefore, to compare evenness between sites/communities, the Species Evenness Index is used which controls for differences in the number of species. E varies between 0 (no species) and 1 where the number of individuals of all species in a community/at a site are equal. S, H' and E values will be compared both within years between sites (same year, different sites), same sites and between years, as well as total diversity at all sites between years.

Population Estimation of Indus Snow Trout and Tibetan Snow Trout

Chapman - Petersen methods will be used to determine estimated population of each fish species.

Formula $$N = \frac{(M+1)(C+1)}{R+1}$$

Where,

N= population estimate

M= number of fish caught, marked and released in first sample

C= total number of fish caught in second sample (including recaptures)

R= number of recaptures in the second sample (fish marked and released in the first sample).

For example, if 100 fish were marked and released from the first run and the second run contained 80 fish of which 10 were recaptures: Then the estimated population would be:

$$N = \frac{(100+1)(80+1)}{10+1} = 744 \text{ fish}$$

Exhibit 11: proposed monitoring location for fish

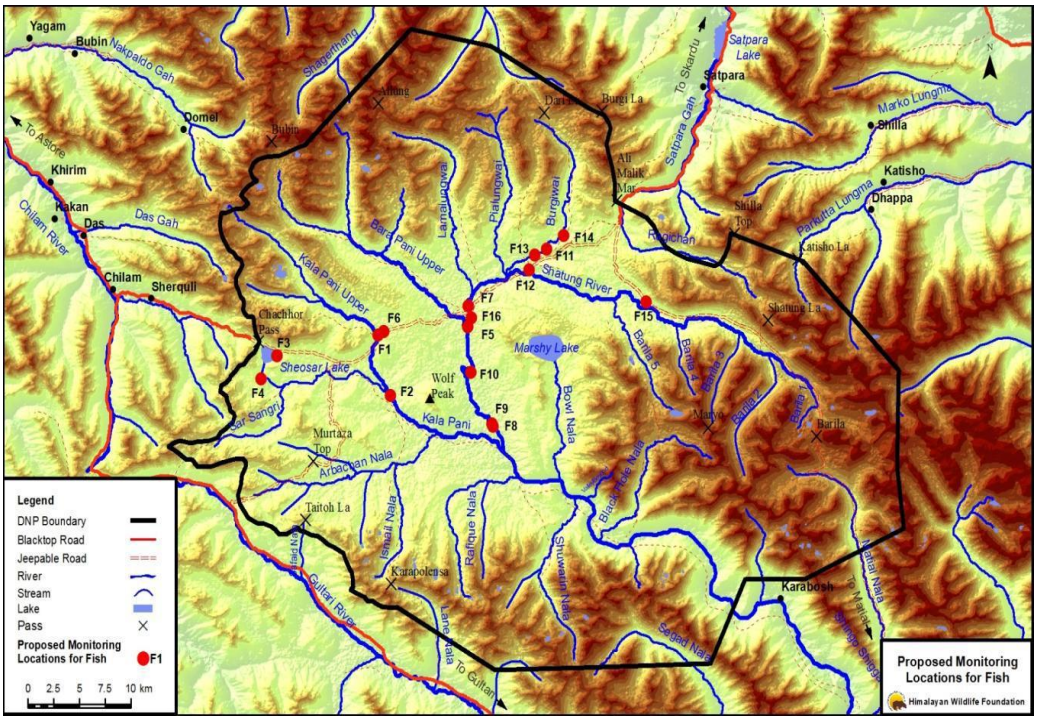


Exhibit 12: Survey form- Fish

ID		W P		Observer(s)			
Date	[dd/mm/yy]		Start Time	[HH:MM]	End Time	[HH:MM]	
	Starting Coordinates		**End Coordinates**	Cloud Cover	%		
Latitude	N		N	Wind	Light Strong	Moderate	
Longitude	E		E	Precipitation	Light Heavy	Moderate	
[Deg Min Sec]				Water Temperature			
River Habitats Riverbed Depth of Riverbed	Riffles Pools Backwaters Runs Rapids Others/Special Habitats_____ Sand/silt Gravel Small Cobbles Large Cobbles Boulders Bedrock _____ _____				Locality		
(Please select only one box for Habitat)							
Elevation (m)		**Temp. (oC)**		**pH**		**DO**	
Turbidity		**No. of cast nets**					

No.	**Species Name**	**Count**	**Fish Size** *(in inches)*	**Fish Weight** *(in kg/g)*	**Comments**

Macro-invertebrates

Many invertebrates feed on algae and bacteria, which are at the lower end of the food chain. Some shred and eat leaves and other organic matter that enters or is produced in the water. Because of their abundance and position as 'intermediaries' in the aquatic food chain, benthos plays a critical role in the natural flow of energy and nutrients (Williams & Feltmate, 1992).

Objective

The objectives of the macro-invertebrate sampling program are to:

- routinely measure a set of pre-defined indicators that will detect trends in macro-invertebrate populations,
- detect shifts in the macro-invertebrate community composition,
- identify any loss of biodiversity.

Changes in the flow regime that are likely to have profound impacts on the proportions or overall abundance of invertebrates or particular species are:

- Shifts in the availability of hydraulic habitat ("living space" for invertebrates defined by flow forces and substratum type) as a result of slower velocities, sediment deposition or a reduction in wetted perimeter.
- water quality changes – either through increased toxicity or as a result of increased respiratory costs associated with e.g. warmer temperatures.

Description of Indicators for Monitoring

The macro-invertebrate indicators are:

- Species richness and diversity
- community structure

Species richness and diversity will be used to assess biodiversity levels and changes in the abundance of different taxa.

Community structure, which incorporates relative species abundances and proportions of functional groups, is a measure of ecosystem "integrity".

Sampling Frequency, Timings and Locations

Sampling for macro-invertebrates will be carried out once a year in July at specified locations along the river and tributaries (**Exhibit 13).** The draft survey form is given in **Exhibit 14**.

Sampling Protocol

Macro-invertebrates will be sampled by adopting the standardized rapid biological assessment sampling techniques (using multi-habitat approach) developed by Barbour et al 1999. A Surber Sampler or D frame kick net will be used for sampling. Twenty efforts will be taken at each sampling station based on percent availability of each biotope. For example, if a sampling station comprised of 80% riffle and 20% pool habitat, then 16 efforts of the Surber Sampler will be conducted in the riffles and 4 efforts in pool (ratio of 80% to 20%).

At each sampling location, the collected material will be rinsed using running clean stream water through the net two to three times. The material will be transferred into a large (white) tray or a bucket. The sample will then be transferred to a container and covered with 10% formalin.

In the laboratory, each sample will be put into a sieve of 500 ||m mesh size and rinsed with running water (to remove traces of formalin). Macro-invertebrates will then be sorted from the samples and identified using a Kyowa Stereozoom Microscope and the identification keys given in Edmondson, 1959; Ali 1967, Ali 1970, Bouchard 2004.

The abundance of macro-invertebrates per square meter will be calculated and the pollution tolerance of the identified taxa will be taken from HKH bios scoring list (Hindukush Himalayan Score Bio-assessment) (Hartmann *et al.,* Deliverable 10). The Functional Feeding Group of each taxon will be identified.

Method for Data Analysis

The abundance of the taxa (family) will be entered into MS Excel spreadsheets to provide a species by sample array (species names in rows, each site/date/hydraulic biotope sample entered in columns), as the basis for the analyses to be conducted.

The diversity will be calculated for

- invertebrate taxa richness (the total number of taxa), and the proportional representation of the richness contributed by each of the major Orders, to identify the broader biodiversity characteristics of the system;
- overall abundance: although this is a highly variable measure, extreme changes in abundance are useful to indicate gross ecosystem change, for example massive proliferation of pest species;
- diversity Shannon-Weiner Diversity Index (*H*'):

Multivariate analysis is useful where the taxa-by-sample arrays are large, patterns in community data not readily apparent. A multivariate package such as PERMANOVA (Clarke and Warwick 2006)27 may be used for analysis.

Exhibit 13: Proposed monitoring locations for marco-invertebrates

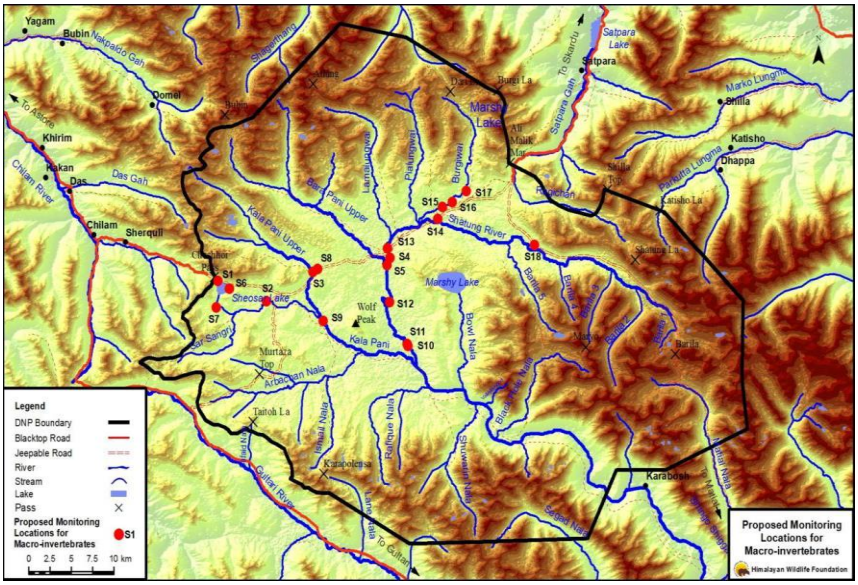


Exhibit 14: survey form- Macro-invertebrates

ID		W P		Observer(s)						
Date			Start Time		End Time					
	[dd/mm/yy]			[HH:MM]		[HH:MM]				
	Starting Coordinates		**End Coordinates**	Cloud Cover	%					
Latitude	N		N	Wind	Light	Moderate	Strong			
Longitude	E		E	Precipitation	Light	Moderate	Heavy			
	[Deg Min Sec]			Temperature						
River Habitats	Riffles	Pools	Backwaters	Runs	Rapids			Locality		
	Others/Special Habitats_____									
Riverbed	Sand/silt	Gravel	Small Cobbles	Large Cobbles	Boulders	Bedrock	_____			
Depth of Riverbed	_____									
	(Please select only one box for Habitat)									
Elevation (m)		**Temp. (oC)**		**pH**		**DO**		**Turbidity**		**No. of cast nets**

No.	*Taxa/Species*	*Count*	*Comments*

Vegetation

Objectives

The objectives of the terrestrial vegetation monitoring are to:

- demonstrate whether or not there are shifts in the population of terrestrial vegetation particularly those species that constitute the diet of the bear
- monitor changes in the broad habitat and land cover

Indicators

The following indicators for monitoring the riparian vegetation will be used.

- Community composition: species composition and the abundance of dominant vegetation species.
  Counts – a simple tally of the number of individuals of a species
  Cover – the percent (%) area of the quadrat occupied by a plant species.
  Density – estimated by quantifying the number of individuals of a species per unit area.
  Frequency – the proportion of quadrats sampled in which the species is represented.

- Habitat cover using satellite images: landsat images constitute a major data source for habitat monitoring, capturing broad scale information on changes in habitat, extent and spatial patterns of fragmentation

Sampling Frequency, Timings and Locations

Sampling for terrestrial vegetation will be carried out once a year in September. The proposed sampling locations are given in **Exhibit** 15 and the draft vegetation survey form is given in **Exhibit 16**.

Methods for Data Collection

The usual means of sampling vegetation for floristic composition is the quadrat. The vegetation in the marginal zone and flood plain in the Study Area will be sampled by the quadrate method, taking 3 quadrates of 5m x 5m at each sampling site. The first quadrat will be taken at the beginning of the transect, the second at 250 meters and the third at 500 m. All sampling points will include representative habitats, topographic and physiographic conditions of the Study Area. Plants from each quadrate will be noted and collected for the assessment of the plant species if required. Additional plant species in the area adjacent to the quadrate will also be noted down and collected to record the occurrence of the species. Cover, relative cover, density, relative density, frequency, relative frequency percentages and Importance Value Index (IVI) for each species from the study will be calculated by using the following formulae:

The Cover and Relative Cover of species will be calculated using the following formula:

$$\text{Cover} = \frac{\text{Total cover (cm) of a specie}}{\text{Number of plants of a species}}$$

$$\text{Relative Cover} = \frac{\text{Total cover (sq cm) of all plants of a species} \times 100}{\text{Total cover (sq cm) of plants of all species}}$$

The Density and Relative Density of the species in the area will be calculated using the following formulae:

$$\text{Density} = \frac{\text{Total number of individuals of a species in all quadrats taken}}{\text{Total number of quadrats taken}}$$

$$\text{Relative Density} = \frac{\text{Total number of individuals of a species in all quadrats} \times 100}{\text{Total number of individuals of all species in all quadrats}}$$

The Frequency and Relative Frequency percentages of the species will be determined using the following formulae:

$$\text{Frequency} = \frac{\text{Number of quadrats of occurrence of a species} \times 100}{\text{Total number of quadrats lay out}}$$

$$\text{Relative Frequency} = \frac{\text{Frequency of a species} \times 100}{\text{Total Frequency of all species}}$$

Importance Value Index (IVI) of all the recorded species will be calculated using the following formulae:

$$\text{IVI} = \frac{\text{Relative cover} + \text{Relative frequency} + \text{Relative density}}{3}$$

Plants collected will be identified following the nomenclature from Flora of Pakistan (Nasir and Ali 1972-199428, Ali and Qaiser, 1995-to date29).

Local people will be consulted to gather information about local names, uses, value and cultural values of the plants of the area.

Exhibit 15: Proposed monitoring locations for vegetation

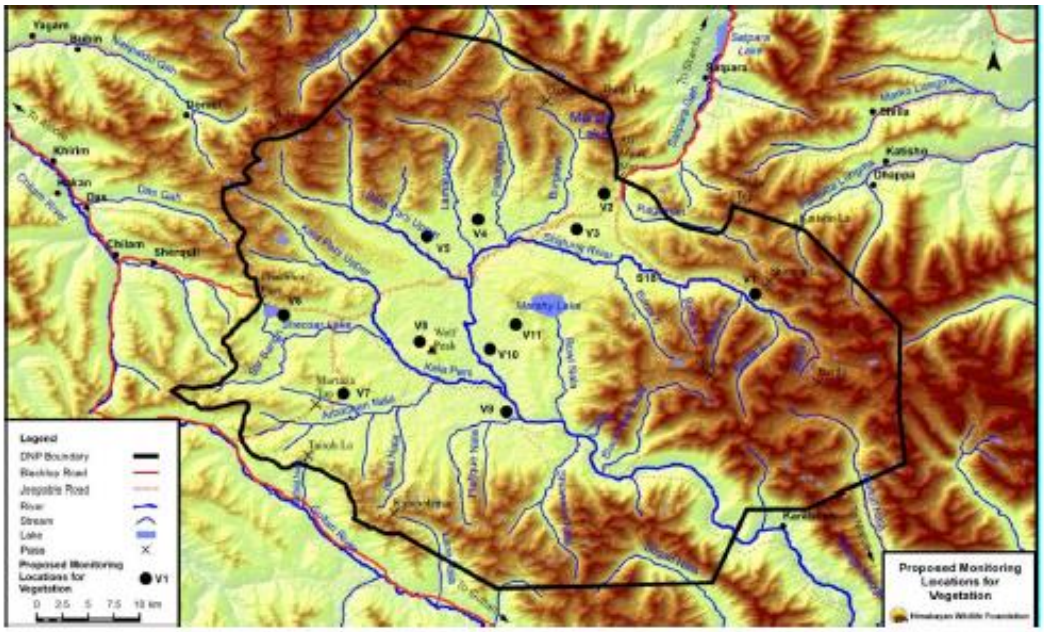


Exhibit 16: Survey form- vegetation

ID		W P		Observer(s)		
Date			Start Time		End Time	
	[dd/mm/yy]			[HH:MM]		[HH:MM]
	Starting Coordinates			**End Coordinates**		
Latitude	N			N		
Longitude	E			E		
	[Deg Min Sec]			[Deg Min Sec]		
Habitat	Riparian Scrub Forest	Agricultural Fields Others/Special Habitats_____		Pine Forest	Locality	
	(Please select only one box for Habitat)					

No.	*Species Name*	*Circumference (Inches)*						
		Count	*1*	*2*	*3*	*4*	*5*	*6*

Data Analysis

The vegetation cover, plant count and diversity as well as the IVI (Importance Value Index) will capture changes in composition and structure of the riparian vegetation. This will be compared using a multivariate analysis package, such as PRIMER (Clarke and Gorley 2006).[30] This will provide an assessment of how, if at all, the riparian vegetation is changing and whether riparian vegetation biodiversity is affected.

To assess changes in vegetation cover and habitat, Landsat images will be compared with baseline images and images of previous years.

Indicators of Response

Exhibit 17 describes the indicators for response, justification for selection of indicators, and proposed targets. A report on response indicators will be prepared by the IMA Consultant on an annual basis.

Exhibit 17: Response indicators

Response Aspect	*Indicator Description*	*Justification for Indicator*	*Target*	*Comments*
Policies, laws, and regulations	Approval of National Park Management Plan	The approved National Park Management Plan will provide formal basis for implementation	End of Year 2	Report will include progress, and a review of adequacy of the plan and remaining gaps if any
	Number of new park management rules, guidelines, developed	This indicator reflects the extent to which adaptive management is taking place		Report will include progress, a review of adequacy of the rules and guidelines, and remaining gaps if any.
Institutional capacity for management	Government approval for expansion and upgrading of the Department as proposed in Institutional Development Plan	Strength and capacity of the Department was identified as a key risk in the Rapid Assessment Report submitted by HWF.	End of Year 2	Report to include progress, and a review of adequacy of structure and number of positions proposed and filled
	Percentage of proposed additional positions filled	Same as above.	50% by end of Year 3 100% by end of Year 4	Report to include a review of capacity of staff added
	Number of staff training programmes completed	Same as above.	At least two annually	Report to include an evaluation of the trainings
Financing of conservation in Deosai National Park	Total amount of funds spent on management	Continued financial dependency was identified as a major long term risk to DNP. In the long term the management of the national park should not be dependent on funds from donors.	Annual increase at least to cover inflation	

Response Aspect	*Indicator Description*	*Justification for Indicator*	*Target*	*Comments*
	Percentage of funds contributed by external sources	To indicate the extent to which the reliance of the Department on external sources and other donors is decreasing	Annual decrease of at least 5% over previous year suggested	
	Percentage of requirements met by internal revenue generation	To indicate the extent to which the contribution of internal revenue sources such as permits and fees is increasing, leading to self-reliance	Annual increase of at least 10% over previous year suggested	
Awareness	Number of community awareness sessions conducted	Community awareness on biodiversity values will reduce the social risks for park management.	One session for each community located in the Socioeconomic Study Area every year	
	Rating of extent of awareness in communities	To indicate the quality and effectiveness of awareness raising activities		Report to include an evaluation of awareness based on administration of structured questionnaires to the community to be designed by the IMA

Limitations

Some aspects of the program, mainly those related to data storage and analysis, are currently incomplete as these will depend on the baseline data being collected. The monitoring and evaluation framework presented in this section should be considered as an evolving document and will be adjusted and adapted over time.

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FORM No. _____
(For official use Not be filled by visitor)

VISITOR ENTRY

Personal Information

Family name _____ First name _____ Nationality _____ Sex ◯ Male ◯ Female

Passport/CNIC No _____ Age _____

Visit Information

Purpose of the visit ◯ Trekking ◯ Research ◯ Other _____

Which areas do you intend to visit? ◯ Ali Malik Top ◯ Shatung Nullah ◯ Bara Pani ◯ Kala Pani ◯ Sheosar Lake

Form DNP which point you will exit? ◯ Satpara ◯ Chillum ◯ Shilla ◯ Dappa ◯ Karabosh

Expected duration of your stay in DNP area: ◯ Weeks_____ ◯ Days_____

Tour Operator Company Name _____

Guide Name: _____ Licence No: _____

- -

To be filled by DNP Staff

Receipt No _____ Date _____

Location: ◯ Satpara Registration Centre ◯ Chillum Registration Centre

Fee Recieved

VISITORS	FOREIGN	NATIONAL	LOCAL
ENTRY FEE	◯ 1200 Rs.	◯ 100 Rs.	◯ 40 Rs.
CAMPSITE FEE	_____ Rs.	_____ Rs.	_____ Rs.

Thank you for your COOPERATION!

FORM No. _____
(For official use Not be filled by visitor)

VISITOR EXIT

Personal Information

Family name _____ First name _____ Nationality _____ Sex ◯ Male ◯ Female

Passport/CNIC No _____ Age _____

Place visited? _____

Tour Operator Company Name: _____

Guide Name _____ Licence No: _____

DNP facilities and key services

Please, give us your feedback about DNP facilities and services

	Very good	Good	Sufficient	Bad	Very bad
How was pre-visit information about the Park?	1	2	3	4	5
How useful the signage regarding the Park are?	1	2	3	4	5
How is Park Staff in terms of friendliness and cooperation?	1	2	3	4	5
How is the condition of toilets in the park?	1	2	3	4	5
How is the access to basic health facility?	1	2	3	4	5
How did you feel your safety inside the Park?	1	2	3	4	5
How are the services provided in the main campsites ?	1	2	3	4	5

Have you visited DNP Website? ◯ YES ◯ NO

To be filled by DNP Staff

Receipt No _____

Entry Form No _____ _____

Location: ◯ Satpara Registration Centre ◯ Chillum Registration Centre

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Thank you for your COOPERATION!

Operational Plan

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
1	Legislation	1.1	Clear rules and regulations inside the Park	1.1.1	Definition of NP according to new forest Act and under process new wildlife Act or notification from competent authority	Activities as large as tourism, road infrastructure, military presence and grazing pressure violate the Gilgit-Baltistan Wildlife Protection, Preservation and Management Act, 1975 under which Deosai National Park has been declared and notified so a new notification is necessary to clarify the category of the park	Notification available	High
		1.2	Regulatory mechanism of buffer zone and buffer zone valleys	1.2.1.	Notification of proposed buffer zone and buffer zone valleys from the competent authority	The proposed buffer zone covers an area of 1379.08 sq. km and hosts almost 50% population of Brown bear and other important wild fauna and flora. Hence the area requires a regulatory mechanism to protect biodiversity and sustainable use of natural resources.	Notification available	High
				1.2.2.	Develop clear rules and regulations for buffer zone and buffer zone valleys through a notification from competent authority		Rules and regulations developed	High
2	Park staff	2.1	Improve DNP Functionality	2.1.1	Park organizational structure. /Organogram	Complete DNP staffing, organogram and develop ToRs of the new positions	New organogram available ToRs for new staff available	High
			Sufficient vigilance to available resource inside the park provided	2.1.2	Appointment of Park Director (01) BPS 19	The position laying vacant since years.	Director appointed	High
				2.1.3	Appointment of regular RFOs (02) BPS 16	Park has no regular RFO to supervise field staff, one position for RFO is also required to be based in Chillum,	Posts created and person is appointed in Chillum office	High

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
						as that office is being run by game watcher and community has strong concerns and they demand for the appointment of an officer there		
				2.1.4	Park/Game inspectors (03) BPS 11	The available field staff strength is inadequate to provide sufficient vigilance and care to wildlife. The proposed staff members are suggested to achieve the desired level conservation objectives.	Posts created and inspectors appointed	High
				2.1.5	Game watchers (30) BPS 07			
				2.1.6	Drivers (02) BPS 5			
		2.2	Environmental awareness and participatory management of the park attained	2.2.1.	Create and maintain strong social mobilization unit at Park or at department level	Majority of the park issues are of social aspects, but there is no social scientist in the park staff	Social mobilization unit established, its ToRs and notification are available	High
				2.2.2	Social Organizer (SO) BPS 16		Post created and SO appointed; notification available	High
		2.3	Improved wildlife health	2.3.1	Appointment of a wildlife veterinarian BPS 17	The duties of a wildlife vet may include sedating animals for procedures, performing exams, giving vaccinations, taking blood samples, administering fluids, performing surgeries when needed, prescribing medications, evaluating and treating wounds, taking x-rays and ultrasounds	Post created and wildlife vet appointed	High

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
		2.4	Promotion of eco-tourism and environmental awareness	2.4.1	Eco-tourism Officer BPS 17	The purpose of the post is to assist in the development and implementation long-term policies, actions and projects within the National Park management plan, that aim to reduce the negative and enhance the benefits of tourism on the area and capitalize on the benefits that visitors bring. He/ She has to work in partnership to develop plans and solutions to improve the viability and sustainability of transport, travel for visitors and waste management	Post created and tourism officer appointed	High
		2.5	Brown bear conservation	2.5.1	Bear /Wildlife Biologist BPS (17)	Identify brown bear research needs and develop appropriate research proposals. Bear conservation measures, monitoring and visitation to winter dens, maintain data on types and frequency of human-bear conflicts with recommendations, training of park staff and assigning work, preparing and responding brown bear information	Post created and bear/wildlife biologist appointed	High
		2.6	Wetlands protection	2.6.1	Limnologist BPS 17	Limnologist monitor, manage, protect and improve wetlands, ponds, streams and marshy areas inside the park taking action where required to rectify problems.	Post created water and wetland officer appointed	High

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
3	Park strengthening	3.1	Strengthening of DNP directorate	3.1.1	Improvement of existing Directorate/ WLMO office	WLMO office is the face of the DNP, but the office needs a thorough revamping including floors, chairs, carpets, white wash, shelves, a touristic information desk	Report available	Low
				3.1.2	Provisioning of field equipment	For effective watch and ward, the basic survey equipment are essential to be provided including GPS (04) devices, spotting scope (01), binoculars (04), tranquillizer gun (01), DSLR camera (01), fish catching nets (04), insect catching nets (04), empty bottles for water sampling, glass jars for insect sampling, camera traps, radio collars and snow skidoos	Items procured Entry into stock register Reports available Tender docs	Medium
				3.1.3	Vehicles (02)	RFOs, park inspectors and watchers with no means of transportation can never be enough to effectively protect 3000.7 sq.km only park and its buffer zone	Items procured Entry into stock register Reports available Tender docs	Medium
				3.1.4	Motor bikes (06)			
		3.2	Identity of DNP increased	3.2.1	Regular updating of newly developed Park website	The Park's website is the "business card" of the protected area. It has the function to attract people to visit the area, but also it must give clear indications about the rules and regulations that should be followed required to avoid negative consequences to the DNP fragile environment. The website should include valley	Website updated with more available information in various sections and linked to the GB Parks and Wildlife Department web platform	Medium

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
						level information and linking it to other relevant departments, PAs and various COs websites if any.		
				3.2.2	Development of DNP visibility material	Visibility material is necessary to develop a corporate image which should cover all sectors and activities of DNP and to make these available at various venues such as exhibitions, educational institutes, airports, tourist information centers and Embassies	Hands books, maps, guides books developed according to the new available information/ surveys	Low
			Participatory Management	3.2.3	Establishment of Park Management Committee (PMC for the institutional management of the DNP.	Directorate to make the identified guidelines applicable according to the developed ToRs of this committee Two community representatives to represent in WLMB	PMC meeting at least once a year conducted, ToRs of PMC developed	High
		3.3	DNP staff capacity building	3.3.1	Performance appraisal of the park staff and trainings courses as per their identified needs.	DNP staff should thoroughly perform the assigned tasks. On the basis of Park organigram specific trainings and courses are necessary, in order to improve performance and particular abilities of the staff. Some of the priority topics for training and courses are listed in the activities of this document (OP).	Evaluation and TNA reports are available for needed training courses/topics and identified training organized	High
		3.4	Improved survival of wildlife species	3.4.1	Designating Deosai/ Sheosar & other potential lakes as Ramsar site	High altitude wetlands of Deosai characterized by Sheosar Lake, at 4,250m, which represents a unique category of alpine wetlands that is confined to the Himalaya, Hindukush and	Proposal for Ramsar site designation developed and submitted	Medium

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
						Karakoram mountain cordilleras. This complex has all the characteristics to be declared as Ramsar site. Even there is no such declared site in whole GB		
				3.4.2	Identifying and establishing connectivity areas with other PAs	Connectivity must be put in place between protected areas to allow species to move from one protected habitat to another. The linking of protected areas to form networks or systems is very important for the survival of many species. One connectivity area between CKNP and DNP has been identified and mapped by Ev-K2-CNR and it needs to be developed more and DNP linkages with Nanga Parbat and other areas to be identified. The construction of road within the Park as fragmented the wildlife habitats and need to be restored through wildlife passages such as over passes, and under passes etc.	Connectivity areas identified, mapped and management guidelines available Inventory developed Wildlife monitoring is being done Water points for wildlife established	Medium
				3.4.3	Identifying and establishing connectivity areas between fragmented habitats within the Park and buffer zone			High
				3.4.4	Inventory of various wildlife species found in connectivity areas, with special focus on Himalayan Brown Bear			Medium
				3.4.5	Monitoring of various wildlife species found in connectivity areas, with special focus on Himalayan Brown Bear			Medium
				3.4.5	Establishment of drinking water points for wild animals in connectivity area			Medium
4	Financial Management	4.1	Supporting the DNP with Government procedures to guarantee Annual Governmental Allocations	4.1.1	Develop the new PC1 for the implementation of the MP/OP and hiring of the staff. Develop PC 4 for the regularization of the staff and their possible rotation	DNP must be annually guaranteed to operate fulfilling its institutional role. Being a National Park, the relative funds - at least the ordinary ones- must be issued by the competent institutions. Priority activities to	PC 1 developed 5 years plan developed and submitted to Planning Department for approval	High

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
					system among the different national parks in GB	be carried out. Based on the findings, 5-years basic program together with the necessary annual funds need to be established. This could also be annually revised on the basis of any identified needs.		
		4.2	Entry Fee	4.2.1	Revised fee structure	Park entry fee is useful to mitigate the negative impacts on park resources due to tourism and as well as for the sustainable development of buffer zone valleys and their natural resource conservation. The current fee should be enhanced as proposed and flexible for any future need	Revised fee structure available	High
		4.3	Campsite fee	4.3.1	Campsite fee implemented	All the four major campsites should be managed by the community from buffer zone valleys, and its fee as proposed should be collected by the community at campsites not at entry points. Clear mechanism if someone is camping and someone is staying at community managed hotels.	Campsite fee and management notification available	High
		4.4	Grazing fee	4.4.1	Collection of grazing fees from nomads	Currently this fee is being collected by Astore Forest Division and mostly nomad's animals graze in the park so this fee should be collected by DNP directorate	Notification available	High
				4.4.2	Revised grazing fee structure	The current fee should be enhanced as proposed and flexible for any future need	Grazing fee revised and	High

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							notification available	
		4.5	Angling fee	4.5.1	Angling fee revised and implemented	The tourists are allowed for sports fishing in park's fishing zone against a fee	Notification available	High
		4.6	Transfer of collected funds to the park	4.6.1	Smooth transfer of entry fee and grazing fee to DNP account	A mechanism needs to be developed to transfer grazing and entry fees to dedicated DNP account and could be used with approval of Conservator Parks and WLMO. These funds should not remain with wildlife department as it is now	Notification available Funds transfer letter available	High
		4.7	Development of buffer zone valleys and their available natural resources	4.7.1	Disbursement mechanism of entry and grazing fee among communities established	PMC should decide how much funds should go to which community, 80% of entry and grazing fee should be spent on community development and conservation of natural resources in buffer zone valleys	Disbursement mechanism in place	High
				4.7.2	Conservation of natural resources in buffer zone valleys	It is mandatory for the community to spend 30% of received funds on conservation activities in buffer zone valleys and the rest 70% they can spend on development but against annual VCSDPs	Notification available Audit reports of the community funds	High
				4.7.3	Development of VCSDPs	Buffer zone valleys can only receive funds from the park against submission and approval of annual valley conservation and sustainable development plans	Annual VCSDPs available	High

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		4.8	Conservation fund to improve protection to available natural resources	4.8.1	Establishment of conservation fund	Conservation fund be set up for the DNP to ensure protection of the park and available of resources. A seed money from government can initiate this fund. Entry fee, grazing fee, angling fee (permit-based fishing in only designated areas) as well as fines can go into the fund.	Conservation fund established	Medium
5	Research activities in DNP	5.1	Promote research along with the academia and other research institutes	5.1.1	Involvement of universities UoBs and KIU in research activities	Coordination with academia particularly involvement of KIU and UoBs will be quite beneficial and cost effective and moreover the capacities of local resource will be built	MoUs available	High
				5.1.2	Keep record of all research interventions and reports	Several institutes, organizations and independent researchers carried out scientific investigations and studies in DNP and its adjoining areas but no record is available. The directorate while issuing permits for the research studies shall make the sharing of research report conditional.	Research record available Permission letters	Low
		5.2	Support scientific based management of the park and addressing general conservation and sustainable goals, and knowledge improvement.	5.2.1	Potential brown bear home range identified and mapped	Identify areas within present and potential brown bear range according to their suitability and importance as brown bear habitat in order to manage those areas for brown bear conservation. To conserve brown bear populations, the ecosystems they rely upon must be managed	Report available Maps available	High

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						so that habitats are not lost nor their quality degraded. Activities not compatible with the conservation of viable brown bear populations should be carefully controlled or prohibited within the areas that will be managed for bears.		
				5.2.2	Damages caused by bear analyzed	Data collected during inspections of bear caused damages are to be standardized and analyzed in order to gather information on species distribution, seasonal feeding cycle and age and kinship structure of the population.	Report available and mitigation measures developed	High
				5.2.3	To investigate brown bear diet, interaction with other carnivores (wolves etc.) and indicators of population vitality (genetics, breeding parasitology)	Specific information on ecology, natural resource potential and socio-economic activities is essential for the science-based management of DNP. The park is famous for its unique landscape and Himalayan Brown Bear but lack of data on species status and distribution is the key challenge for conservation and management of biodiversity of the National Park	Research reports/ publications are available Census reports are available Plants inventory available Herbarium sheets developed	High
				5.2.4.	Scientific census of flagship species through genetics, camera trap, radio collars			High
				5.2.5.	Carrying capacity of Brown Bear in DNP			High
				5.2.6.	Base line information on the status of golden marmot and threats			High
				5.2.7	Medicinal plants identification and their use by the community			High

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					within Park and buffer zone			
				5.2.8	A comprehensive inventory of plants within Park and Buffer zone			High
				5.2.9	Trend of non-palatable spp. from palatable spp.			High
				5.2.10	Identify insect fauna of DNP and its association with the plants			High
				5.2.11	Impact of tourism on the local flora and fauna in DNP			High
				5.2.12	Identification of the biodiversity hot spots in DNP			High
				5.2.13	Impacts of livestock grazing inside DNP and grazing pattern			High
				5.2.14	Identification of the Bear/Wildlife concentration zones inside DNP			High
				5.2.15	Inventory of avifauna			High
				5.2.16	Development of the data base of herpetofauna and its ecological linkages			High
				5.2.17	Physic-chemical traits of various water bodies			High
				5.2.18	Develop proper inventory of aquatic fauna			High
6	Legal Framework	6.1	Legal support for management rules	6.1.1	Analysis of the customary laws with the new statutory laws in relation	New forest act is approved and in place and the new wildlife act has been drafted and in process of approval. Therefore, the use	Analysis made and new proposed rules available.	Medium

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					to the sustainable use of natural resources.	of natural resources by local communities is mainly done following customary laws - which may be different in different communities- rather than the new statutory laws. It is important to verify which of these customary laws and statutory laws are in line with the sustainable use of natural resources measures identified for the different Park areas, Indicating which changes would be necessary.	Proposed rules submitted to department/ competent authority for amended rules and improvement of the GB draft wildlife Act	
				6.1.2	Possible improvement of customary practices	A proper management of Protected Area should take into account the long-term conservation of natural ecosystems and the basic needs of local communities, especially when it regards mountain areas where populations are in critical situations. The indications that are being developed with the zoning of DNP follow this principle: prohibiting activities potentially impacting the areas dedicated to conservation, but allowing a sustainable use of natural resources in other areas of the Park. In some cases (e.g. grazing) statutory laws are very restrictive, and do not allow the use of natural resources by local communities even with the use of sustainable methods. In some	Analysis made and new proposed rules available. Proposed rules submitted to department/ competent authority for amended rules and improvement of the GB draft wildlife act	Medium

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						specific cases, it is then necessary to propose the amendments of the existing laws at the GB level, verifying which can be the implementation process		
7	Community involvement in Park Management	7. 1	Participatory management of natural resources established	7.1.1	Identify opinion leaders and stakeholders in brown bear management; set up local management boards and involve them in management planning and implementation	If people affected by brown bears oppose their presence or reestablishment, this will result in their eradication or expensive guarding systems to enforce legal protection. Acceptance of brown bears by locals is increased if they have been part of the management process. Local involvement is best achieved through a public participation program. This program includes a Park Management Committee (PMC), which is involved in the planning process. The idea is that people support decisions they helped make. A committee with local stakeholders or representatives for the values that exist in the area (agriculture, hunting, environment, tourism etc.) will ensure that the planning process is responsive to local conditions and needs.	PMC established and meetings conducted Minutes are available	High
		7.2	Capacity building and participation of local communities	7.2.1	Promote the establishment of community	Such reliable and accountable community organizations are a pillar for the implementation of the MP. The social mobilization	CBOs established in all valleys	High

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					Organization (Cos) at village/valley level (if not present) and to be further strengthened	process has to be strengthened with the full support of all stakeholders.		
				7.2.2	Buffer zone communities' capacity building through trainings about their role in park management and protection of natural resources	The participative approach supposes a direct involvement of local communities in the activities related to Park Management. Thus, the knowledge of local communities on natural resources management needs to be implemented.	Training reports	High
				7.2.3	Community mobilization through field meetings with DNP buffer zone valley			High
		7.3	Public awareness, education and information	7.3.1	Information and awareness campaign. The campaign should address the tourists and community differently. The community should be aware and informed regarding general brown bear ecology, damages caused by wildlife particularly brown bear and how to limit them, human safety and waste management	In order for the brown bear conservation strategy to be successful, the public must be committed to making it work. Only an informed public will be able to share a commitment to brown bear conservation. People living in or frequenting bear habitat must be educated about the presence of bears, how to avoid contact with bears, how to keep bears out of garbage and other human food sources, and what to do when they meet a bear in a threatening situation. This information should be directed to decision makers, those with commercial interest within bear habitat, and the public in general.	Reports available Pictorials	High

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				7.3.2	Establishment of environment/conservation clubs at school level	Educational institutes have been identified as one of the most powerful instruments for bringing about the changes required to achieve sustainable development. Clubs are useful in creating awareness, advocacy, conservation, maintenance of school environment.	Clubs are established in selected schools in buffer zone valleys	Low
				7.3.3	Close coordination with stakeholders established	DNP needs to collaborate more closely with all stakeholders particularly government line departments, academia, and civil society while devising plans and strategies. The stakeholders should be taken into confidence for such interventions and incorporating their viewpoints.	Coordination meeting minutes Joint events organized	High
				7.3.4	Training/ orientation of the public	Advice to community and public about how to avoid or reduce problems when confronted with a brown bear is an important message in public education and information campaigns.	Orientation sessions reports available	Low
8	Wildlife	8.1	No unnatural deaths inside the park and buffer zone	8.1.1	Law enforcement is intensified	The brown bear is protected by law; law enforcement is intensified in the park and buffer zone area where poaching is identified as an important threat or limiting factor for the population.	Improved watch a ward mechanism, patrolling, seasonal assessments Appropriate penalties are adopted	High

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				8.1.2.	Wildlife activities outside the park/ in buffer zone such salting points, water points	Wildlife activities outside the park/ in buffer zone such salting points, water points	Salting points and water points established at identified sites	Medium
				8.1.3.	Collection of brown bear and other wildlife carcasses	entire carcasses of bears killed in the wild or found dead, are to be collected for precise age determination, parasitological examination and diet studies	Diagnostic results available	High
		8.2	Improved protection to brown bear habitat	8.2.1	Identify and maintain or create linkage zones in fragmented populations of brown bear and other wildlife species	To conserve brown bear populations, the ecosystems they rely upon must be managed so that habitats are not lost nor their quality degraded. Activities not compatible with the conservation of viable brown bear populations should be carefully controlled or prohibited within the areas that will be managed for bears.	Linkage zones identified, mapped and maintained	High
				8.2.2	Carefully control or prohibit human activities proven or suspected to be detrimental to brown bears in the brown bear core areas and linkage zones.	Brown bear core areas, buffer zones and travel corridors should be identified and assessed to protect the areas of greatest importance for brown bear conservation. It would be positive to include as much bear habitat as possible in the buffer zone area	Areas identified and mapped	High
		8..3	Uninterrupted brown bear movement	8.3.1	Avoid development of physical infrastructure	It is essential to take into account the opportunity for movement of bears and other large mammal species when planning and building linear infrastructures in the landscape	Reports of bear movement available	High

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						– not creating fences without interruption Physical corridor such underpass, tunnels etc. eco friendly		
		8.4	Habitat protection and improved favorable conservation status of bear population	8.4.1.	Monitoring of brown population outside the park boundaries	The water shed and bear hibernation areas to be monitored which plays a crucial role in achieving a favorable conservation status of bear population.	Monitoring report available	High
		8.5	Precise population estimates and monitoring of the population trend.	8.5.1	Brown bear population census and surveys	Information necessary for species conservation should be obtained according to a set methodology. Conducting Bear survey in DNP is a great task, however, the count shall be more reliable and valid if conduct on each vantage point the same season, months and dates each year. Moreover, data sheet may also be modified, including information GPS coordinates, tracks, slope angle, time of sighting, activity of the Brown Bear at the time of sighting, weather condition, temperature, barometric pressure, survey starting time and end time etc.	Survey reports are available till end of year	High
		8.6	Developing and accessing sustainable Trophy Hunting (TH) program in CCHA	8.6.1	Assess effectiveness of TH procedures related to the local community's income and wildlife conservation and implementation proposal	TH program can be considered a valuable conservation tool if: a. a sustainable harvesting of trophy heads that does no! create imbalances in	Conservation protocols are available,	Medium

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						the population, is performed the majority of the income generated by TH programmes remain available to local communities, which in turn must invest a part of it on nature conservation programmes. b. In DNP, TH is structured according to these patterns, but an analysis of the results obtained so far should be conducted in order to develop, where appropriate, more sustainable operational protocols.	Wildlife surveys are available CCHA conservation plan is available	
				8.6.2	Strict implementation of funds for conservation 20% out of 80% given to the communities	The philosophy of TH funds includes the conservation initiatives taken by the community in their relevant CCHAs.	Proper auditing of funds in relation to conservation activities are available	Medium
		8.7	Improved bear prey species	8.7.1	Marmot habitats improved through tourist and wildlife/ livestock restrictions	Given the considerable concern about the potential impacts of increasing human and livestock population, habitat degradation and increased tourism, proper planning and awareness programmes are recommended in entire DNP to sustain the species in the area. Marmot is an	Free movement of tourists restrained Awareness campaigns launched	High

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						important prey species of brown bear and even snow leopard		
9	Aromatic/Medicinal Plants & Non-Wood Forest Product (NTFP)	9.1	Identify and status of various NTFPs found in the Park and buffer zone	9.1.1	NTFP data collection, threats analysis and description	To properly manage the resource, it is necessary to rely on updated and reliable field data so it is essential to have at least one person trained on the subject.	Data collected Study List of potential threats available Report available	Medium
		9.2	Control over exploitation and illegal trade of NTFPs	9.2.1	Development of management strategy for NTFPs	To encourage fair trade and sustainable use of NTFPs, it is necessary to have concreate management strategies and monitoring.	Management strategies developed and implemented	Medium
		9.3	Improve conservation for the targeted species	9.3.1	Identification of threatened and endangered species	In the zoning process, specific zones for all Med. & NTFP conservation were not realized yet. It may be necessary to define new conservation areas in order to preserve certain species in the long run	List available	Medium
				9.3.2	Establishment of conservation areas	Designation of conservation areas for Aromatic/ Medicinal Plants & NTFP, on the basis of the results of specific research on the different species.	Any additional conservation areas established	Medium
		9.4	Assessing use of Ar./Med. Plants & NTFP	9.4.1	Develop field surveys for use, harvesting and assessment of the impact of these activities on their conservation.	A list of medicinal plants together with their use have been prepared by Ev-K2-CNR, including harvesting time and methods of collection but this does not cover all the areas of the park, the surveys need to be extended.	Survey developed with: list of medicinal/ aromatic plants and NTPF, with related use	Medium

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		9.5	Improved role of medicinal plants in conservation and livelihood	9.5.1	Ex-situ conservation of med. plants	The demand for Ar.& Med. plants is increasing day by day. To improve the conservation of important plant species having high demands, the cultivation of Med. plants on community lands shall enhance the conservation and livelihood needs of the communities. The linkages and synergies should be built with herbal industries.	List and cultivation sites identified Ex-situ conservation initiated	Medium
				9.5.2	Identify community farmers, enhance and refine farming and marketing skills		Farmers identified and their skills enhance	Medium
10	Tourism	10.1	Develop tourism without any harm to the natural resources and the cultural heritage	10.1.1	Promotion and development of ecotourism interventions	Since Deosai has become a tourist spot, every month in touristic season around 5,000 to 6,000 vehicles are entering DNP. Their exhaust fumes are trapped in the cold mountain air. Identify ecotourism as a mean to foster local development and to enrich local and visitors about the ecological importance of DNP and its surrounding areas	Reports of eco-tourism intervention available	Medium
				10.1.2	Restrict movement of heavy traffic from the Park		Office order available	High
		10.2	Interpretation of the Park resources	10.2.1	Development of visibility material, guided tours, self-explanatory maps and encourage trekking	Interpretation of important park resources tells the visitors why DNP has value to them, and could be source of knowledge, inspiration and responsibility.	Visibility material developed	High
				10.2.2	Training of local youth as tourist guides	Hire and train the local youth on the park resources and register as guides who shall accompany the groups to see and know more about the park resources and also make sure that the tourists are not involved in activities that are injurious for the park , its resources and	Local youth identified and trained as tourist guides	Medium

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						reputation as a peaceful environment		
				10.2.3	Interpretation and documentation of old cultural/ historical heritage sites in Park and buffer zone	According to the park staff and the community the Wolf peak in the park can be a potential culture heritage site as people found remains of old farming implements and arms, same with the Burgay top as it was junction of old travel route so study is needed for the interpretation and documentation of such sites	Old heritage sites identified their list and interpretation available	Low
		10.3	Display park ethics	10.3.1	Development and installation of Park ethics signage and both entry points and camp sites	Park rules and ethics must be displayed and encourage trekking rather using cars with guides.	Park rules and regulations displayed	High
		10.4	Basic tourism facilities improved	10.4.1	Existing toilets improved and maintained and 12 new toilets installed at various campsites	Existing toilets are insufficient to address the needs of 50 to 60 thousand tourists from June to September	Toilets installed	High
		10.5	Park heritage restored	10.5.1	Old suspended bridge at Bara Pani restored	That bridge remains iconic to DNP, it should be restored as park heritage attraction	Bridge restored Report available	Low
		10.6	Tourists facilitation improved	10.6.1	Development of information centers	Both the entry points Satpara and Chillum should serve as tourist information centers while entering into the park where tourists usually stay for registration and for rest. The washrooms in both centers are in bad shape, lack of brochures etc., multimedia	Tourist centers developed	High

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				10.6.2	Establishment of tourist registration system at both entry points (digital system and communication both sides)	Knowledge about visitor characteristic is one of the main factors to take into consideration while promoting sustainable tourism. Data related to visitor trends and flows are basic and required to better plan for future. Collection of visitors' data could support informed and awarded decisions this data could be useful in various areas of park management as well as for different people, different organizations and potential users. This could be achieved through development of the software, entry and exist forms and acquisition of basic equipment's such as computers, printers and a trained computer operator. Ev-K2-CNR already developed entry and exist forms and are part of this MP.	Entry and exist forms available Software procured Computer and printer available Computer operator hired and trained	High
		10.7	Diversified tourist attraction	10.7.1	Development of Burgay top as mountain view point	Majority of people while traveling to GB desire to have a glimpse of mighty K2. Burgay top is a potential site inside the park for K2 view and can be developed as eye catching touristic spot	mountain view point established	Low
				10.7.2	Development of trekking itineraries and maps from Shagarthgang, Shilla and Dappa valley to the Park	There are several potential trekking routes to the park from buffer zone valleys but still unexplored	Itineraries and maps are available	Low

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		10.8	Waste Management System in placed	10.8.1	Waste Management System for DNP to be established and implemented	Currently DNP is without any dedicated waste management system including collection of solid waste, management of toilet waste and its further safe disposal	System in placed	High
				10.8.2	Awareness raising of tourist and other stakeholders on waste management		Notification or office order available and implemented	High
				10.8.3	Restrict grazing near water bodies			High
				10.8.4	Ban on plastic inside the Park			High
				10.8.5	Ban on the dustbin along the road and camp sites			High
				10.8.6	Identify and establish the waste dumping sites		Dumping sites identify and established	High
				10.8.7	Installation of an incinerator		One incinerator procured and installed	High
				10.8.8	Implementation of polluter pay principle	The 'polluter pays' principle is the commonly accepted practice that those who produce pollution should bear the costs of managing it to prevent damage to wildlife health or the environment.	Implementation of penalties	Medium
				10.8.9	Banning or black listing of tourists reported for misconduct and any illegal activity	Discourage non-serious visitor and introduce a system of banning those visitors in the future who have been reported for misconduct or other negative activities.	The system in placed	Low

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				10.8.10	Hiring of seasonal waste collection and management staff (04) and provision of safety measures and kits for cleanup staff	DNP has no dedicated staff for waste collection and management	Staff hired Kits acquired	High
11	Infrastructure Development	11.1	Negative impacts of built infrastructure minimized	11.1.1	Stakeholder's consultation for any further development	Any kind of built infrastructure is not allowed inside the park. The existing Deosai road is very old and necessary for the travelers and tourists and moreover the communities deserve to have all services for livelihood at their doorstep that requires all stakeholders to sit jointly to find out win-win ways conserving nature and serving communities. Moreover, diversion of Shatung river is also on cards due to dire need of water for power generation and irrigation	Consultation reports available	High
				11.1.2	Environmental Impact Assessment of road and river diversion, Initial Environmental Assessment/Examination (IEE)	EIAs are compulsory for any big projects and DNP must ensure the implementation of all EIAs	Implementation report available	High
				11.1.3	Annual maintenance of road	Park people should be involved in construction of road and there must not be removal of soil and stones for the maintenance from sides of the existing road	Report available	High
				11.1.4	Improvement and maintenance of staff	The camping sites and accommodations for the park staff are very poor and lacks	Staff camping sites improved	High

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					camping sites inside the park and at Murtaza top	basic necessities. It is necessary to provide reasonable camping and accommodation against extreme weather and wild animals so that watch and ward activity should be carried out in an improved way.		
		11.2	Improved watch and ward	11.2.1	Construction of boundary pillars	Boundary pillars are already constructed in some parts but the existing pillars are damaged or even removed by the community. The present park boundary runs along rivers, mountains etc., and needs improved demarcation through conspicuous and well-maintained boundary pillars in place of the current inconspicuous ones to prevent encroachment of land and to present illegal entry of people. It needs GIS support with provision of financial resources. Zone indications/ or pillars for various zones of the park	Boundary pillars constructed	High
Section 2 Buffer zone and buffer zone valleys								
12	Livestock	12.1	Prevention against disease transmission to wildlife	12.1.1	Mandatory vaccination of livestock and shepherds' dogs prior entering into the park	Prevention is always preferable to treatment. Protecting animals from disease also prevents transmission and slows further spread. Vaccination and biosecurity promote the health and wellbeing of both livestock and wildlife inside the park	Vaccination scheme available Annual vaccination report available	High

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		12.2	Improved management of livestock grazing inside park	12.2.1	Mechanism to register nomads, local shepherds, their type of livestock	The shepherds and livestock information give key information to management the park resources in a much-improved way for the future	Mechanism developed, available and implemented	High
		12.3	Livestock losses minimized	12.3.1	Orientation of shepherds and nomads	Advice about how to avoid or reduce problems when confronted with a bear	Orientation report available	High
		12.4	Conflict between communities/ nomads and brown bears, and other wildlife mitigated	12.4.1	Establish compensation programs with built-in measures to minimize cheating	One of the most important steps in helping mitigate the conflict between farmers and brown bears is a system of compensation for the damages caused by brown bears. Some countries oppose compensation programs, arguing that it creates dependency. It is also important to take into account that some farmers strongly object if any livestock are killed. In that way the question is not only financial, but also emotional. This is why prevention is of utmost importance.	Compensation scheme/ livestock insurance available Herders compensated Receipts available	High
		12.5	Emerging trends in livestock rearing and changes in pastoral system	12.5.1	Information collection regarding recent changes and trends in pastoral system. Immigration and lack of interest of young generation	Livestock rearing plays a key role not only in agrobiodiversity conservation and maintaining the high rangeland ecosystem, but also in cultural traditions, livelihood strategies, and all aspects of socioeconomic development in the high mountain areas of Deosai. However, livestock is increasingly coming under pressure due to lack of fodder	Livestock trends available and documented	Low
		12.6	Changes in livestock aspects related to livelihood options	12.6.1	Changes in livestock aspects related to livelihood options			Low

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						availability, restrictions on grazing and movement and less economic returns. Furthermore, livestock herders are facing immense livelihood challenges, due to climate change, and the younger generation is unwilling to continue with traditional herding, which poses a severe threat to this traditional occupation. Availability of fodder, animals' deaths due to diseases and predators' attack, improving the condition of the pastures, and raising the living standards of the local herders are growing challenge. The recent trends also reveal that buffer zone communities are hiring paid professional herders as compared to the past when communities' members take their animals themselves to the alpine pastures		
		12.7	Improve fodder availability	12.7.1	Intervention to increase fodder availability during winter/spring periods, with particularly attention on: fodder seeding in farming areas, methods of fodder conservation, implementation of fodder cultivations wastelands.	The limited food availability in winter seems to be one of the factors having the greatest impact on the physical state and productivity of livestock, making more vulnerable to disease. It also indirectly affects the pastures' conditions that are loaded in advance and then longer exploited.	Guidelines developed and applied. Interventions initiated and report available	High

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13	Aromatic/Medicinal Plants & Non-Wood Forest Product (NTFP)	13.1	Identify and status of various NTFPs found in the Park and buffer zone	13.1.1	NTFP data collection, threat analysis and description	To properly manage the resource, it is necessary to rely on updated and reliable field data so it is essential to have at least one person trained on the subject.	Data collected Study List of potential threats available Report available	Medium
		13.2	Improve conservation for the targeted species	13.2.1	Identification of threatened and endangered species	In the zoning process, specific zones for All Med. & NTFP conservation were not realized yet. It may be necessary to define new conservation areas in order to preserve certain species in the long run.	List available	Medium
				13.2.2	Establishment of conservation areas	Designation of conservation areas for Aromatic/ Medicinal Plants & NTFP, on the basis of the results of specific research on the different species.	Any additional conservation areas established.	Medium
		13.3	Assessing use of Ar./Med Plants & NTFP	13.3.1	Develop field surveys for use, harvesting and assessment of the impact of these activities on their conservation.	A list of medicinal plants together with their use have been prepared by Ev-K2-CNR, including harvesting time and methods of collection but this does not cover all the areas of the park, the surveys need to be extended.	Survey developed with: list of medicinal/ aromatic plants and NTPF, with related use	Medium
		13.4	Improved role of medicinal plants in conservation and livelihood	13.4.1	Ex-situ conservation of med. plants	The demand for Ar.& Med. plants is increasing day by day. To improve the conservation of important plant species having high demands, the cultivation of Med. plants on community lands shall enhance the conservation and livelihood needs of the communities. The	List and cultivation sites identified Ex-situ conservation initiated	Medium
				13.4.2			Farmers identified and	Medium

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
					Identify community farmers, enhance and refine farming and marketing skills	linkages and synergies should be built with herbal industries.	their skills enhance	
		13.5	Control over exploitation and illegal trade of NTFPs	13.5.1	Development of management strategy for NTFPs	To encourage fair trade and sustainable use of NTFPs, it is necessary to have concreate management strategies and monitoring.	Management strategies developed and implemented	Medium
		13.6	Sustainable use of medicinal plants	13.6.1	Capacity building of the communities	Improved technical skills of locals on medicinal plants' identification, harvest, processing, use and packaging that could lead to have increased opportunities for income generation for local communities.	Training conducted and report available	Medium
14	Vegetation and Forest	14.1	Impacts of climate change explored	14.1.1	Vegetation analysis and grass productivity	The change in weather pattern has badly affected the snow and rainfall patterns. That has affected the water flow in the streams and rivers, and in turn, the growth of grass.	Report available Training	Medium
		14.2	Assessing illegal harvesting of forest	14.2.1	Analyze the pressure on forest patches around DNP with special focus on Birch, Juniper and Kail trees	The illegal harvesting causes a severe damage not only in terms of conservation, but also for local communities as unsustainable resources exploitation does not allow their maintenance in the medium/long term particularly in Gultari, Karabosh and Shagarthang	Report produced and intervention measures defined	High

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
		14.3	Promote forest natural regeneration	14.3.1	Protection through fencing and watch and ward	Regeneration is quite possible, it just needs effective watch and ward and fencing some areas	Report available	High
		14.4	Promotion of the use of fuel-saving stoves	14.4.1	Promotion of fuel-saving stoves uses in local communities	The use of high efficiency stoves with a good reduction in the consumption of fuel (wood) allows ensuring a living comfort by reducing the consumption of wood and also the impact on vegetation.	Community sensitized on the efficiency of stoves	Medium
		14.5	Development of sustainable natural vegetation management plan	14.5.1	Identification of potential areas for plantation	Identification of the areas where the plantation could be sustainably managed. These areas will be individuated on the basis of their vegetation n (closed/opened forest, Artemis a, etc.). Priority will be given to conifers closed forests.	Individuated areas.	High
				14.5.2	Development of plantation management plan (take info from current MPA project interventions from WWF as well as SLF and other) Pasture Management Plans	On the basis of areas individuated within 14.3.1, specific applied management indications will be assessed, in order to allow a different use of natural vegetation from local communities, by assuring the long- period survive of the resource as well as the ecosystem conservation.	Natural vegetation management plan with indicators available and	High
				14.5.3	Implementation of vegetation management plans in selected areas	In the areas assessed within 14.3.1 the management indications formulated. The results will be analyzed through specific indicators. These activities will be carried out under the control and	Management plan applied and results assessed.	High

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
						supervision of the Vegetation Committee.		
				14.5.4	Constitution of Vegetation Committee with representatives from DNP and local communities	The activities of applied management of natural vegetation in selected areas will be carried out under direct control and supervision of a committee, which comprises representatives of local communities and of DNP.	Committee established and operational	High
		14.6	Reducing pressure in natural resources	14.6.1	Collection of *Picea smithiana* seeds and *Pinus wallichiana* seeds	Collection and conservation of seeds following standard protocols from local communities. Part of these seeds will be used for re-forestation programs, while a part will be sold by generating an economic income for communities.	Seeds collected and conserved, ready to be used or sold	Medium
				14.6.2	Establish nurseries of fast-growing multipurpose tree species far promotion of social forestry on surrounding valleys	WWF doing in the MPA project, need information from them Establishment of nursery will promote sustainable forest management and reduce pressure on natural vegetation.	Nurseries established	Medium
15	Water	15.1	Evaluating water quality in DNP valleys	15.1.1	Developing of a water sampling program for chemical and microbiological analysis of streams and springs DNP and water collection points in villages	Based on a specific sampling program, water samples along water ways and of water sources in the villages are collected by properly trained Park's game watches	Report and database available.	Medium
		15.2	Improved water quality			On basis of the achieved results, a Water Safety Plan is		Medium

S. No.	Sector	Prescription No	Management Prescriptions	Activity No	Management Interventions	Description	Means of Verification	Priority Rank
				15.2.1	Development of a Water Safety Plan at valley level (villages)	structured where the measures to be carried out in order to increase the water quality far the different uses, is structured.	Report with management indications available.	
		15.3	Water irrigation channel	15.3.1	Repair and maintenance of existing water channels	All of buffer zone valleys are agrarian based with subsistence farming and for them water channels are the life line	Water channels maintained	Medium
				15.3.2	Construction of new water channels		New water channels constructed	Low
17	Tourism	17.1	Improved livelihood options	17.1.1	Eco-tourism promotion in buffer zone valleys	Buffer zone valleys of DNP are beautiful and have enormous potential to attract tourists. These areas need to be promoted through campaigns and developing visibility material	Visibility material developed	High
		17.2	Identifications of a network of hotels and lodges for tourism in areas and villages nearby of the greater DNP points of interest.	17.2.1	Preparation of an ecotourism services protocol, including the identification and information abound creation of sanitary accommodation to make them more accessible.	The accommodation availability and their quality are not adequate and require the development of private business activities on the basis of a protocol agreed with the DNP Directorate.	Report and guidelines Available List of networks of hotels	High
18	Agriculture	18.1	Explore possibilities for double cropping	18.1.1	Check areas where double cropping is feasible and, once identified, organize capacity building activities	Identifications of areas where double cropping could be applied (extending double cropping from lower areas into higher parts of DNP).	Areas identified and capacity-building activities organized.	Low