

Restoration of World Heritage Site Nanda Devi Biosphere Reserve, Uttarakhand

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ABSTRACT

Uttarakhand is bestowed with unique landscape and diverse flora and fauna. One of the examples of world heritage site in the state is the Nanda Biosphere reserve located at the northern part of the state. A World Heritage Site is a place on the globe which has a unique cultural or physical significance and magnificent universal value to the humanity. It may include a building, a city, a complex, a desert, a forest, an island, a lake, a monument or a mountain. They are included in World Heritage List to provide it protection for future generations to recognize and enjoy. It is natural world heritage site which encompasses exceptional diverse and rich flora and fauna which are endemic to the area. It is the center of biodiversity. About 800 species of plants are found, of which 600 species are reported from Valley of flowers which is dominated by family known as Asteraceae. 45 medicinal plants are used by local villages and several species, such as *Saussurea obvallata*. Different faunal surveys in the reserve have resulted in presence of about 18 mammals and about 200 species of birds. The area is under the threat due to continuous human interference. Important one includes unorganized camping, pollution, etc. The need of hour is to protect biodiverse rich areas and to some extent the government has taken some of the measures.

Keywords: Nanda devi biosphere reserve, World heritage sit

INTRODUCTION

A World Heritage Site is a place on the globe which has a unique cultural or physical significance and magnificent universal value to the humanity. It may include a building, a city, a complex, a desert, a forest, an island, a lake, a monument or a mountain. They are included in World Heritage List to provide it protection for future generations to recognize and enjoy.

One of the hill states of the country Uttarakhand treasure of biodiversity and encompassing 71% of its geographical area under forest. In the North of Garhwal Himalaya is the Nanda Biosphere reserve with unique landscape, ecosystem, species and genetic variations. Biosphere reserve is the area comprising of diverse flora and fauna representing high degree of endemism of native species. The Nanda Devi basin comprising of 182.63 km² was declared as Nanda Devi Sanctuary in 1939. To protect the area of national park was upgraded to biosphere reserve in 1988. In 1992 the Nanda Devi National Park was included in the list of World Heritage Site by UNESCO for its unique natural beauty and being the habitat of many rare and endangered species of

plants and animals latter the valley of Flowers National Park was included in Nanda Devi Biosphere Reserve in 2002. The total area of the Nanda biosphere reserve is about 6,384 km². Nanda Devi National Park is separated by high mountain ranges and which is cup shape. The route to the park is very difficult due to major mountain peaks such as Daunagiri (7,066 m), Changbang (6,864 m), Kalanka (6,391 m), Rishipahar (6,992 m), Nanda Devi East (7,434 m), Nanda Khat (6,611 m). Trishul (7,120 m), Nanda Ghungti (6,368 m) surrounds it. India's second highest and world's tenth

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highest, the Nanda Devi main peak (7,817 m), is situated on a ridge arising from the eastern rim joining the main summit with Nanda Devi East. The Valley of Flowers National Park is surrounded by Gauri Parbat (6,590 m) and Rataban (6,126 m) in the east, Kunthkhal (4,430 m) in the west, Saptaring (5,038 m) in the south and Nilgiri Parvat (6,479 m) in the north. The major valley portion of the park is a wide alpine meadow, in the east west direction along the bank of river Puspawati.

OBJECTIVES OF NDBR

Following objectives have been identified for functioning of NDBR on the basis of UNESCO's guidelines [1-7]:

- Ensure the conservation of landscapes, ecosystems, species and genetic variations in core zones (Nanda Devi National Park and Valley of Flowers National Park), buffer zone and transition zone.
- The traditional resource use system in the buffer zone should be encouraged.
- Promotion of economic development that is culturally, socially and ecologically sustainable at local level.
- Formulation of the strategies that help in improvement and management of natural resources in the buffer zone.
- Facilitate support for research, monitoring, education and information exchange at different level local, national and global issues of conservation and development.
- Knowledge generated by research through site-specific training and education to be shared.
- For the management of natural resources keeping alive the traditional knowledge and experiences development of community spirit.
- Community owned tourism to be encouraged in the buffer area in general and also in the core areas in a very restricted and regulated way.

Unique value of the area

The broad altitudinal range of the region has led to evolution of several distinctive ecological groupings. The region is characterized by high degree of endemism of all groups of animals and plant. Some species are distributed in large area whereas others are restricted.

Criterion (vii)

The Nanda Devi National Park is distinguished for its remote mountain uninhabited, dominated by India's second highest mountain at 7,817 m and protected on all sides by striking topographical features including glaciers, moraines and alpine meadows. This spectacular landscape is complemented by the Valley of Flowers, a wonderful beautiful high-altitude Himalayan valley. Its 'gentle' landscape, magnificent beautiful meadows of alpine flowers and ease of access has been recognised by many renowned explorers, mountaineers and botanists mentioned in literature for over a century and in Hindu mythology for much longer.

Criterion (x)

The Nanda Devi National Park, with its vast range of high altitude habitats includes remarkable populations of flora and fauna encompasses a number of threatened mammals, significantly snow leopard and Himalayan musk deer, as well as a large population of bharal or blue sheep. Estimates for wild ungulates, galliformes and carnivores within the Nanda Devi National Park are in abundance than those in similar protected areas in the western Himalayas. The Valley of Flowers is internationally significant due to its diverse alpine flora, typical representative of the West Himalaya biogeographic zone. The rich diverse of species reflects the valley's position within a transition zone between the Zaskar and Great Himalaya ranges to the north and south, respectively, and between the Eastern and Western Himalaya flora. The plant species recorded from the area are endemic to the area thus not found elsewhere in Uttarakhand and many of the globally threatened and two have not been recorded in Nanda Devi National Park. The area is also the house of threatened species of medicinal plants is higher than other Indian Himalayan protected areas. The entire Nanda Devi Biosphere Reserve is located within the Western Himalayas Endemic Bird Area (EBA). EBA has seven restricted-range bird species which are endemic to this part.

THE FLORA

The Nanda Devi Biosphere Reserve encompassing highly luxuriant and diverse flora due to its exceptional geographical location, climate and topography along with altitudinal variation. Major part of its geographical area is under forest. As per the altitude variation and floristic combination, the Botanical Survey of India, Dehradun and the Wildlife Institute of India, Dehradun, identified about 800 species of plants (Table 1 and Figure 1).

Table 1. Vegetation types of NDBR-1999.

Vegetation Types	Total Area (km ²)	Total Area (in %)
Temperate Vegetation	303.27	16.68
Alpine Vegetation	1178.7	64.85

Alpine Scrub and Meadows	335.41	18.45
Total	1817.38	100

Source: Singh and Mal [8]

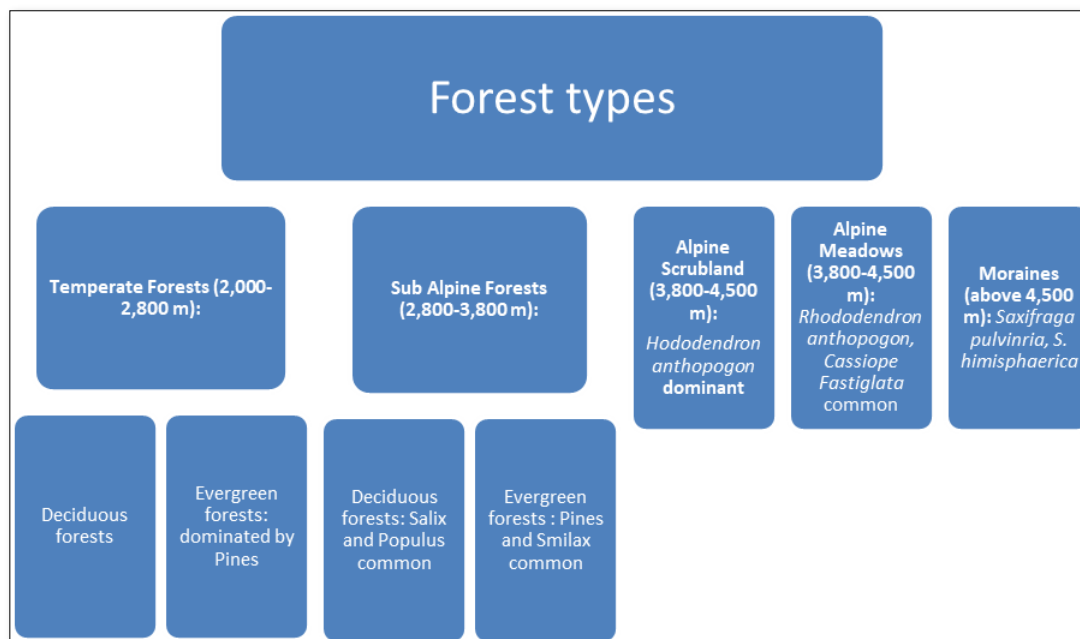


Figure 1. Types of forests.

THE FAUNA

The Nanda Devi Biosphere Reserve has a different variety of mammals and bird species. Different faunal surveys in the reserve have resulted in presence of about 18 mammals and about 200 species of birds. Some of the important mammalian species are Bharal or the blue sheep. It is dominant and most conspicuous among the large mammals. It is mostly seems to be more partial to gentle grassy slopes. Still, it could be tracked as high as 5,300 m, well above the snow line. Tahr is another to be reported plentiful in the park but is hard to observe, as it mostly observed in the most difficult terrain in the Rishi gorge. Goral is another animal to be found in good numbers. Musk deer is reported to exist in a small number in the birch forests of Rishi gorge. Once it was abundant in the area but now the animal has become the victim of greed of human for musk pod.

The larger carnivores include snow leopard and common leopard, Brown bear which have been reported from the reserve. It is, though, very difficult to observe it due to inapproachable habitat and swiftness. Black bear is quite common in the area. Reserve is very rich for the avifauna mostly the high altitude birds. Some of the important high altitude birds found in the reserve are Monal Pheasant, Snow Cock, Koklas Pheasant, Himalayan eagle, etc.

Over 600 species are reported from Valley of flowers which is dominated by family known as Asteraceae. It contains 62

species. 45 medicinal plants are used by local villages and several species, such as *Saussurea obvallata*. There are 76 wood species trees: 24, shrubs: 52 and 13 forest communities. Many rare animal species are reported from The Nanda Devi Biosphere Reserve and about 83 species of animals that are reported from this reserve. They include Common Langur, Himalayan black bear, Himalayan Thar, Common Leopard, snow leopard, Mainland Serow, bharal (Blue Mountain goat), brown bear, goral and Himalayan musk deer. Another attraction of the Nanda Devi National Park includes rich assortments of butterflies. It is said to be around 27 species including the Common Yellow Swallowtail, Queen of Spain and Indian Tortoise shell.

Threats

In spite of some community-based ecotourism to small portions of these parks, there was no anthropogenic pressure in this area since 1983. This property therefore acts as a control site for the maintenance of natural processes and is of high significance for long-term ecological monitoring in the Himalayas.

1. Different mountaineering activities which are unorganized threaten the biological integrity of the national park.
2. Pollution is one of the major problems caused by tourists. The camping sites become polluted with garbage from hikers left unclean after they leave.

Contamination of the rivers and streams due to the leftover garbage, causing harm to the fauna dependent upon.

3. Human interference causing deforestation and forest fires in the Nanda Devi Biosphere needs to control. Establishing campsites in the park is the cause of forest fire.

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