

## NEORA VALLEY - A NEW SHORT-LISTED WORLD HERITAGE SITE

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### Introduction

The pristine forest of Neora Valley National Park (NVNP) in Kalimpong hills, Darjeeling district, which has formed an ecological trijunction with Sikkim and Bhutan, is the last virgin wilderness in West Bengal. It is one of the oldest (1881) reserve forests in India. Since this area has been put under protection and is an unworkable working circle, the high forest remains intact. Besides, due to its inaccessibility and difficult terrain, biotic pressures are not very acute. Hence, NVNP is a well-preserved serene wildlife habitat. But the rich heritage of NVNP was unknown to the external world up until December 1982, when the Himalayan Club, along with Zoological Survey of India, Department of Botany, Calcutta University, West Bengal Forest Development Corporation and Indian army organized the first expedition to the then uncharted Neora Valley forest from Lava. As an outcome of this expedition there was a sustained campaign later on to save its pristine character. In 1985, Ghose also reported on ecological observations on Neora Valley. It was notified as a protected area of national importance in April 1986 and finally gazetted in December 1992. In May 2009, NVNP was also been included in the shortlist of World Heritage sites (UNESCO World Heritage Centre, 2009).

NVNP lies in the biogeographic province 2C of the Central Himalayas (Rodgers *et al.*, 1988, 2002). The park spreads over 88 km<sup>2</sup>, located between latitudes 26°52'03"N-27°7'35"N and longitudes 88°45'E-88°50'E; however, the actual surface area available to the wild denizens is, in fact, much greater owing to its undulating terrain. The highest point is Rechila danda peak (3,170 m) bordering Sikkim.

### Biodiversity values

Neora Valley is recognized as a global biodiversity hotspot for its unique ecosystem, where tropical,

sub-tropical, temperate and sub-temperate forests represent a wealth of biodiversity. It is designated as one of the key biodiversity areas in the Eastern Himalayas for mammals and birds (WWF-US, Asia Program, 2005). This area is included in one of the 25 Global Hotspots (Myers *et al.*, 2000), the Global 200 forest eco-regions (Olson and Dinnerstein, 1998), two endemic bird areas (Stattersfield *et al.*, 1998) and several centers for plant diversity (Davies *et al.*, 1995). It is also an integral part of the Kanchenjunga landscape (Sharma and Chettri, 2005; Chettri *et al.*, 2007a). NVNP is considered as West Bengal's crowning glory because of its wide range of environment gradients (183 m – 3,200 m) and climatic conditions, supporting a unique and ecologically important undisturbed patch of late succession forest. In spite of being located in the Oriental Region, this park has some floral and faunal similarities with the Palaearctic Region of the adjacent zoogeographic zone. Moreover, it has characteristics of all the three sub-regions, namely the Himalayan Montane System, the Indian Peninsular sub-region and the Malayan sub-region. NVNP, along with its adjoining forests of Kalimpong Forest Division, is also an important ecological corridor in Eastern Himalayas for movement of long-ranging animals to and from other contiguous protected areas (PAs) in northern Bengal (e.g., Gorumara National Park, Mahananda and Chapramari Wildlife Sanctuaries), Sikkim (Pangolakha Wildlife Sanctuary) and Bhutan (Torsa Strict Nature Reserve, Jigme Dorji, Thrumshingla and Bomdeling National Parks) linking Arunachal Pradesh (India) (Chettri *et al.*, 2007b; Wangchuk, 2007).

### Habitats

NVNP exhibits a rich variety of habitats, as the area comprises the catchment and watershed of the Neora River, which is fed by nine main streams and sixteen subsidiary streams. There are

also a few wetlands like Jorepokhri (latitude 27°8'N and longitude 88°44'E), below the Rechila danda, Panchpokhri in West Nar-5 compartment and Tempola Khola at East Nar-22 compartment. Four habitat types are recognized in NVNP, namely: i) Subtropical Mixed Broadleaf Forest; ii) Lower Temperate Evergreen Forest; iii) Upper Temperate Mixed Broadleaf Forest; and iv) Rhododendron Forest. The density of vegetation is generally >0.4, except at Rechila Chawk, which was deforested in 1879 (Singhal and Mukhopadhyay, 1998). NVNP is extremely rich in flora and fauna, which have recently been studied in parts of this park.

### Flora

Forty-five fern, 154 angiosperm and 1 gymnosperm species were enumerated in the virgin Neora valley (Majumdar *et al.*, 1984). Eighty-three medicinal, 59 edible, 18 ornamental, 21 poisonous (irritants and lethal) and 11 plants having fascinating assorted ethnic uses have also been identified (Rai and Das, 2004). NVNP is home to 52 orchid species, including some endemics (UNESCO World Heritage Centre, 2009). The common species of rhododendrons found here are *Rhododendron arboruem*, *R. barbatum*, *R. falconeri* and *R. dalhousiae*.

It is also famous for the medicinal plants found there (PRAGYA, 2007) including *Swertia chirata*, *Lycopodium* spp., *Aconitum* spp., *Aristolochia* spp., *Berberis cristata*, *Costus speciosa*, *Didymocarpus pedicellate*, *Rouwolfia serpentine*, etc. Jaributi valley of Upper Neora is famous for producing the most important medicinal plants. Cryptogams of this park are little known, but approximately 20% of the total species known till now [680 angiosperms (flowering plants), about 23 Pteridophytes (vascular plants), 4-5 species of Gymnosperms (seed-bearing plants)] are extremely rare and face the threat of extinction (Singhal and Mukhopadhyaya, 1998). These include *Arisaema griffithii*, *Balanophora neorensis* (a unique species of parasitic angiosperm), *Balanophora polyandra*, *Begonia gemmipara*, *Betula utilis*, *Botrychium* sp., *Cardamine macrophylla polyphylla*, *Cinnamomum impressinerum*, *Cyathea* sp., *Digitalis purpuria*, *Eleocarpus lanceifolius*, *Gentiana pedicellata*, *Geranium nepalense*, *Ilex*

*hookeri*, *Ilex odorata*, *Monotropa* sp., *Partia monlana*, *Ranaculus ficarifolius*, *Ranunculus tricuspis*, *Rhododendron arboreum*, *Rhododendron barbatum*, *Rhododendron dalhousiae*, *Rhododendron falconeri*, *Rhus* sp., *Ribes glaciata*, *Schisandra neglecta*, *Swertia bimaculata*, *Swertia chirata*, *Swertia dilatata*, *Swertia nervosa*, *Taxus baccata*, *Thalictrum foliolosum*, *Utricularia* sp., *Viburnum cotinifolium*, *Viburnum grandiflorum*, *Viburnum stellatum* and all species of orchids.

### Fauna (mammals)

Biswas *et al.* (1999) identified 32 species of mammals in the upper NVNP, belonging to 16 families and 5 orders, representing more than 17% of the total mammalian diversity in West Bengal. Of these, 9 species are protected under Schedule I of the Indian Wildlife (Protection) Act, 1972. Some other records of species richness in NVNP are also available (Sharma, 1990; Mukhopadhyay, 1996; Singhal, 1999; Chakraborty *et al.*, 2008a, 2008b; UNESCO World Heritage Centre, 2009; Anonymous, 2010). A compilation of all these documentations shows that the registered species diversity in both the upper and lower NVNP is 65.

Populations of some of these species have been assessed like Red panda *Ailurus fulgens fulgens* (28-32), Himalayan black bear *Ursus thibetanus laniger* (18), Gaur *Bos gaurus gaurus* (81), Himalayan tahr *Hemitragus jemlahicus schaeferi* (32), Goral *Naemorhedus goral hodgsoni* (73), Serow *Capricornis sumatraensis jamrachi* (89), Sambar *Rusa unicolor niger* (286), Barking deer *Muntiacus muntjak vaginalis* (590) and wild boar *Sus scrofa cristatus* (615). Some other important species, the populations of which could not yet be assessed, are Clouded leopard *Neofelis nebulosa macrosceloides*, Leopard *Panthera pardus fusca*, Leopard cat *Prionailurus bengalensis horsfieldi*, Marbled cat *Pardofelis marmorata charltoni*, Indian pangolin *Manis crassicaudata*, Chinese pangolin *Manis pentadactyla aurita*, Malayan giant squirrel *Ratufa bicolor*, Hodgson's flying squirrel *Petaurista magnificus*, Wild dog *Cuon alpinus primaevus*, Elephant *Elephas maximus indicus*, Fishing cat *Prionailurus viverrinus viverrinus*, Assamese macaque *Macaca assamensis pelops*, Rhesus macaque *Macaca*

*mulatta mulatta*, Moupin pika *Ochotona thibetana sikimaria*, Rufous tailed hare *Lepus nigricollis ruficaudatus*, etc. Discovery of tiger *Panthera tigris tigris* (20) in 1998 prompted the forest department to include NVNP as a sensitive wildlife zone. The population of long-ranging mammals in NVNP like tigers, elephants and Indian bisons or gaurs, fluctuates seasonally due to inter-PA and trans-boundary migration through the identified corridors, particularly along the riverbeds. Hathi danda was a traditional elephant route up to 1940 (Anonymous, 1010). Rechila (Chawk) including Jaributi valley (latitudes 27°05'-27°07'N and longitudes 88°43'-88°45'E) and Alubari (latitude 27°07'N and longitude 88°43'E) are two ideal sites for viewing the wildlife movements.

### Aves

NVNP, including Lava, is a birders' paradise. One hundred and six species belonging to 22 families and 8 orders have been recorded (Singhal and Mukhopadhyay, 1998). The semi-evergreen forests between 1,600 m and 2,700 m are home to several rare species like Rufous-throated partridge, Satyr tragopan, Crimson-breasted woodpecker, Darjeeling woodpecker, Bay woodpecker, Golden-throated barbet, Hodgson's hawk cuckoo, Lesser cuckoo, Brown wood owl, Ashy wood pigeon, Mountain imperial pigeon, Jerdon's baza, Black eagle, Mountain hawk eagle, etc. (Anonymous, 2010).

### Amphibians

Fifteen species of amphibians are recorded in NVNP (Mukhopadhyay, 1996; Singhal and Mukhopadhyay, 1998).

### Reptiles

Twelve species of lizards and 47 species of snakes have been identified in this park (Mukhopadhyay, 1996; Singhal and Mukhopadhyay, 1998).

### Fishes

Thirty-one species of fishes have been recorded here (Mukhopadhyay, 1996; Singhal and Mukhopadhyay, 1998).

### Insects

There are 276 species of insects (118 genera, 89 families and 17 orders) and 38 species of other invertebrates (mollusks, arthropods and annelids), including 6 species of leeches, that have been identified in NVNP (Mukhopadhyay, 1996; Singhal and Mukhopadhyay, 1998). The Neora valley is richly blessed with a medley of beautiful butterflies like the Kaiser-i-Hind and Krishna peacock.

### Eco-tourism

The nearest railhead of NVNP is New Jalpaiguri (132 km) and the nearest airlinik is Bagdogra airport. On procuring an entry permit after payment of requisite fees, the park may be approached either from Lava on the west (30 km from Kalimpong) or from Samsing on the east (80 km from Siliguri). NVNP is an adventurous place for hard-core nature lovers and trekkers because it is a virgin natural forest with dense bamboo groves, a colourful canopy of rhododendron trees, lush green valleys and meandering rivers and streams with snowcapped mountains in the backdrop forming a picturesque landscape. Starting from Lava, the first night halt is at Chaudapheri (2,372 m), a distance of 14 km. The second destination is Alubari via Zero Point and PHE source [16 km (13 km through dense forest and 3 km through undulating valley)]. Next camping is at Jorepokhri or twin ponds (2,782 m), after trekking through bamboo and rhododendron forest (8 km). Then halt at Bhottekharag on the bank of Bhote Khola (stream), about 30 km away via Mouchaki. Samsing is only 20 km from Bhottekharag. These trails are often difficult with steep descents (600/700) and slippery. There is no watchtower in NVNP for viewing wildlife. Moreover, the visibility in dense forest is not more than 5 to 10 m and often less than 2 m on either side of the trekking route. So, the chance of sighting an animal, other than some avifauna, is almost zero, unless they cross the trail. The only threat in the forest is the possibility of a sudden attack by the Himalayan black bear. Trekking in the mysterious NVNP is a life-time experience.

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