

VOL 2

DISCOVERING THE **HIMALAYA**



S.S. NEGI

DISCOVERING THE HIMALAYA

VOLUME TWO

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Preface

Stretching in an arcuate shape for about 2400 kms from Kashmir in the north-west to Arunachal Pradesh in the north-east, the Himalayan mountain chain is the most fascinating feature on the face of the earth. A considerable part of the Himalaya lies in India, while Nepal occupies the central Himalaya and Bhutan forms a part of the eastern Himalaya.

The Himalayan mountains encompass a variety of eco-physiographic terrains ranging from the hot and dry tropical/sub-tropical lands occurring in its southern fringe to the temperate and arctic areas of the snow-bound higher slopes and finally to the cold deserts of the Tibetan plateau in the north.

This region has a complex ecology, geology, physiography, drainage, forest wealth and wildlife. It is inhabited by millions of people belonging to different religions, communities and races. This encyclopaedic handbook covers all major dimensions of the Himalaya and the people inhabiting this mountain chain.

This book set in two volumes contains a vast wealth of information on all aspects of the Himalaya and will serve as a handy reference book for scholars, researchers, mountaineers, tourists and all those who have love and inquisitiveness for the Himalaya.

I am grateful to my friends and colleagues who have inspired me in my writing endeavours. Thanks are due to my family for their self-denial and to the publishers for motivating me to prepare this encyclopaedic work.

SHARAD SINGH NEGI

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National Parks, Sanctuaries and Biosphere Reserves

India's first national park, the Hailey (now Corbett) national park was set up in the foothills of Uttarakhand in 1936. Since then many national parks, sanctuaries and biosphere reserves have been constituted in the Himalayan region for conserving and managing the rare fauna and forest ecosystems, whose well-being is essential for survival of human civilization in the Indian sub-continent.

The area under national parks and sanctuaries in the Himalayan region is given in the following table:

Region/State	As % of geographical area	As % of forest area
Jammu & Kashmir	0.36	2.03
Himachal Pradesh	3.56	9.15
Uttarakhand	6.17	35.06
Sikkim	11.60	32.00
Bhutan	7.94	11.21
Arunachal Pradesh	3.57	5.36

This chapter describes the national parks, sanctuaries and biosphere reserves of the Himalaya.

JAMMU AND KASHMIR

Dachigam National Park

The Dachigam national park is situated on the southern slopes of the main Himalayan range, about 20 kms north of Srinagar. This

area was constituted into a national park in 1981. Prior to that it was a wildlife sanctuary.

This protected area was once a game reserve of the Maharaja of Kashmir. It also afforded protection to the thick forests that regulated the water supply to Srinagar town. Even today, a large part of Srinagar receives drinking water from Dachigam area.

This tract is made up of steep mountain sides, deep gullies, V-shaped valleys, incised meanders, boulder-strewn streams and glaciated amphitheatres in the upper tracts. Two main offshoot ridges of the main Himalayan range form the most prominent geomorphic feature of upper Dachigam. The upper tracts lie at elevations of over 4200 mts.

A temperate climate is experienced in the lower reaches while arctic conditions prevail in the higher tracts near the tree line. Precipitation is both in the form of rain and snow. Winters are very cold and severe. The mercury drops down to far below the freezing point during the peak winter season. Snowfall commonly occurs during this period and may cover the ground for several weeks at a stretch.

The Dachigam national park is famous for the Kashmir stag. This area is one of the few pockets in which this magnificent animal still survives. Other animals found in this area are brown bear, black bear, leopard, musk deer and many species of high altitude goat and sheep. Over 150 species of birds are found in this national park. The fast-flowing mountain streams abound in rainbow trout.

Hemis National Park

This is a high altitude park set up in 1981 in the eastern part of the cold desert of Ladakh. It encompasses an area of about 600 sq kms of the Markha and Rumbak valleys. Ladakh region is situated across the main Himalayan range. The conditions are very bleak and difficult. The land is rocky, barren and supports a poor vegetative growth. Alpine pastures adorn the upper sheltered slopes.

Sub-arctic to arctic climatic conditions prevail in this area. This area lies in the rain-shadow of the main Himalaya and hence rainfall is restricted to a few showers each year. The mercury drops down to far below the freezing point in winter. Snow remains on

the ground from mid-November to early April. Summers are short and mild.

This national park is the home of a number of rare and endangered species of the trans-Himalayan tract viz. snow leopard, Tibetan wild ass or kiang, ibex and bharal. Amongst the rare bird species found here are the snow cock and snow partridge. Many migratory birds pass through this area on their way to warmer parts of India.

Kistwar National Park

The Kistwar national park was set up in 1987. It covers an area of about 400 sq kms of the Kistwar region near the border of Jammu and Kashmir with Himachal Pradesh. This area forms a part of the catchment of the river Chenab. The elevation varies from 1700 mts to 4800 mts.

The faunal assemblage of this national park resembles that of the adjoining Kashmir valley, Ladakh and Chamba areas of Himachal Pradesh. This is the home of leopard, Kashmir stag, brown and black bears, civet cat, grey langur, ibex, musk deer and many species of birds.

Overa Wildlife Sanctuary

This is a small wildlife sanctuary located in the eastern part of the Kashmir valley. It was set up as a sanctuary in 1981 and covers an area of 32 sq kms. This sanctuary has recently been merged with the Overa-Aru sanctuary described in the following text.

Coniferous and broad-leaved forests of the temperate, sub-alpine and alpine belts are found in different parts of this sanctuary. The Overa wildlife sanctuary is the home of leopard, musk deer, serow, markhor and many interesting species of birds.

Overa-Aru Wildlife Sanctuary

This sanctuary covers an area of about 400 sq kms in the upper catchment of the Lidder river upstream of the mountain resort of Pahalgam in Kashmir valley. It also includes the area of the Overa sanctuary described in the previous text.

This sanctuary is the home of many rare and threatened high

altitude species. These include leopard, Kashmir stag, brown bear, black bear, ibex, musk deer and various interesting species of birds.

Gulmarg Wildlife Sanctuary

Gulmarg is a popular mountain resort near Srinagar in Kashmir valley. Dense forest occurs in this area. The tract around Gulmarg has been constituted into a wildlife sanctuary. It encompasses an area of about 180 sq kms.

The Gulmarg wildlife sanctuary is the home of many interesting high altitude species. These include leopard, brown bear, black bear, musk deer, ibex, markhor and smaller mammals including the squirrels and field mouse. Amongst the birds are the snow cock, western tragopan and different species of eagles and vultures.

Shankaracharya Hill Wildlife Sanctuary

Shankaracharya hill is a dominating hill-top overlooking the Dal lake and Srinagar. It is the destination of hundreds of tourists each day. The hill-top affords a commanding view of the Kashmir valley for tens of miles. Before 1940, the forests occurring on this hill were depleted due to the removal of fuel wood, small timber and fodder. There came a stage when this hill became virtually devoid of trees. Thereafter, a massive afforestation and rehabilitation programme was taken up to increase the tree cover. This met with considerable success. Today, the Shankaracharya hill supports a good forest cover.

Ramnagar Wildlife Sanctuary

The Ramnagar wildlife sanctuary is located in the Jammu hills. It covers an area of about 13 sq kms.

This sanctuary is the home of leopard, jungle cat, hyaena, sambhar, cheetal, wild boar, porcupine, hare, field rat and squirrels. Amongst the birds found here are the jungle fowl, pheasants and woodpeckers.

Trikuta Wildlife Sanctuary

This is a small sanctuary located in the Jammu hills. It is perhaps

the smallest protected area in the Himalayan region. The Trikuta sanctuary encompasses an area of about 3 sq kms.

The principal forest types found in this sanctuary resemble those of Ramnagar sanctuary. Amongst the main animals found in the Trikuta sanctuary are hyaena, jungle cat, cheetal, wild boar, porcupine and many species of birds.

Jasrota Wildlife Sanctuary

This is a small wildlife sanctuary located in the south-western part of the state near the border with Punjab. It covers an area of 10 sq kms on the right bank of the river Ujh.

The principal forest types found in this area are akin to those found in Ramnagar and Trikuta sanctuaries.

The Jasrota sanctuary is the home of many interesting species of mammals, birds, reptiles and fishes. Amongst these are leopard, flying fox, cheetal, wild boar, porcupine, field mouse, rhesus monkey, common langur, jungle fowl, cheer pheasant, woodpeckers, warblers and many species of fishes.

Surinsar Mansar Wildlife Sanctuary

This sanctuary covers a 40 sq kms of protected area located in the lower hills of Udhampur district.

Amongst the main animals and birds found in this sanctuary are leopard, jungle cat, porcupine, cheetal, wild boar, flying fox, barking deer, jungle fowl, pheasants, jays, tits, warblers and wood packers.

HIMACHAL PRADESH

Great Himalayan National Park

The Jawaharlal Nehru Great Himalayan national park was set up in 1984. It covers an area of 1736 sq kms to the south-east of Kullu and extends from the valley bottom to the crest of the main Himalayan range. This is one of the largest protected areas of Himachal Pradesh. The valleys of the rivers Sainj and Tirthan—the two major tributaries of the river Beas—lie within this national park.

The terrain in the upper tract has been covered by past glaciations. In the lower reaches, running water is largely responsible for the present geomorphic features. River terraces and incised meanders occur along the rivers Sainj and Tirthan and their tributaries. The slope varies from very steep to precipitous.

A typical temperate climate prevails in the lower tracts while the upper reaches experience an arctic to sub-arctic climate.

This national park was created primarily for preserving the rich faunal assemblage of the higher Himalaya. The mammals found in this national park are leopard, jungle cat, civet cat, hyaena, brown bear, black bear, musk deer, barking deer, ghoral, porcupine and wild boar. Amongst the birds are the khalij pheasant, cheer pheasant, western tragopan, monal, Himalayan vulture and jungle fowl.

Pin Valley National Park

Pin valley is a remote, high altitude tract in the dry zone of north-eastern Himachal Pradesh. This area was constituted into a national park in 1984 to conserve and manage the trans-Himalayan flora and fauna. A large part of the total area of this park is under a permanent cover of snow.

High peaks towering to elevations of over 6000 mts hem this valley from all sides. The terrain is glaciated and the main geomorphic features include razor-sharp ridges, hanging valleys, moraines, glacial depressions and amphitheatres.

This national park is the home of many higher and trans-Himalayan species which include snow leopard, many species of wild goats and sheep, snow cock, snow partridge, eagles and vultures.

Shikari Devi Wildlife Sanctuary

This sanctuary was set up in 1974 in Mandi district. It covers an area of about 213.5 sq kms.

The principal animals found in this sanctuary are leopard, hyaena, black bear, ghoral, barking deer, pheasant, tits and warblers.

Majathal Wildlife Sanctuary

The Majathal sanctuary was set up in 1974 in the lower hills near

Bilaspur. It covers an area of about 94 sq kms.

This sanctuary is famous for the ghoral. Other mammals found here are leopard, jungle cat, barking deer, black bear, field mouse, porcupine and wild boar. Amongst the main birds found here are the jungle fowl, cheer pheasant, swallows and woodpeckers.

Kelatop-Khajjar Wildlife Sanctuary

This is a relatively old sanctuary constituted in 1958 in the upper hills of Dalhousie area of Chamba district. It covers an area of about 47 sq kms. The famous Khajjar lake lies within this sanctuary.

Amongst the main mammals found in this sanctuary are leopard, jungle cat, civet cat, brown bear, musk deer, barking deer, mountain goat and sheep. The bird species include the western tragopan, cheer pheasant, monal, Himalayan vulture and jungle fowl.

Bandli Wildlife Sanctuary

The Bandli wildlife sanctuary is located in Mandi district. It covers an area of about 41 sq kms. This protected area was created in 1974.

The main species found in this sanctuary are leopard, jungle cat, black bear, ghoral, jungle fowl, cheer pheasant, tits and warblers.

Talra Wildlife Sanctuary

The Talra wildlife sanctuary is located in Solan district. It covers an area of about 76 sq kms. This sanctuary was set up in 1974.

This sanctuary is the home of leopard, jungle cat, wild boar, porcupine and many species of birds including the cheer pheasant.

Chail Wildlife Sanctuary

The Chail wildlife sanctuary was created in 1975 in the picturesque Chail hills of Solan district. It encompasses an area of about 23.3 sq kms.

The main animals and birds found in this sanctuary are leopard, jungle cat, black bear, ghoral, porcupine, musk deer, khalij pheasant, cheer pheasant, monal, tits, warblers and woodpeckers.

Shilli Wildlife Sanctuary

The Shilli wildlife sanctuary was created in 1974. It covers an area of 2 sq kms in Solan district.

The Shilli sanctuary is the home of civet cat, jackal, cheer pheasant and jungle fowl.

Shimla Catchment Wildlife Sanctuary

The catchment set aside for supplying water to Shimla town has been constituted into a wildlife sanctuary. It covers a large tract of dense forests below the Hindustan-Tibet road near Shimla. There is virtually no biotic interference in this area and it is thus aptly suitable for wildlife conservation.

The sanctuary is the home of leopard, black bear, ghoral, flying fox, musk deer, khalij pheasant, cheer pheasant and jungle fowl.

Pong Dam Wildlife Sanctuary

This sanctuary includes the vast reservoir created by the Pong dam that has been constructed across the river Beas near the Punjab-Himachal Pradesh border. The reservoir and its surrounds were declared as a sanctuary in 1983. It falls within Kangra and Una districts.

The lake is the home of many interesting resident aquatic bird species and migratory birds from Central Asia and Siberia. A number of pisces and amphibian species are also found in the waters of this lake.

Renuka Wildlife Sanctuary

The Renuka wildlife sanctuary covers the tract around the Renuka lake in Sirmour district. It encompasses an area of about 13.5 sq kms. This sanctuary was created in 1964. A lion safari has recently been set up in this area.

Amongst the animals found in this sanctuary are leopard, cheetal, wild boar, flying fox, ghoral, cheer pheasant and jungle fowl.

Simbalwara Sanctuary

The Simbalwara sanctuary is located on the southern flanks of the

Paonta valley in Sirmaur district. It covers an area of about 55 sq kms.

The Simbalwara sanctuary is one of the richest wildlife areas in Himachal Pradesh. Amongst the mammals found in this sanctuary are tiger (not resident), leopard, wolf, wild boar, cheetal, sambhar, ghoral and porcupine. There are also a number of interesting species of birds and reptiles.

Naina Devi Wildlife Sanctuary

The Naina Devi sanctuary covers an area of about 163.5 sq kms around the famous Naina Devi temple situated atop a peak of that name in Bilaspur district.

This sanctuary is the home of many interesting species, viz. boar, pheasants and woodpeckers.

Gobind Sagar Lake Sanctuary

This is another wetland reserve situated in Bilaspur district. It includes the Gobind Sagar lake formed by the erection of the Bhakra dam across the river Satluj. This sanctuary covers an area of 100 sq kms.

This sanctuary is the home of many interesting species of resident and migratory species of aquatic birds and reptiles and fishes.

Raksham-Chitkul Wildlife Sanctuary

This protected area was set up in 1962 in north-eastern Kinnaur. It covers an area of about 138 sq kms.

This sanctuary is the home of many important species which include snow leopard (not resident), leopard, brown bear, mountain goats and sheep, monal, eagles and vultures.

Lippa Asrang Wildlife Sanctuary

This is a 109 sq kms protected area located in Kinnaur district. It was declared as a sanctuary in 1962.

The main species found in this sanctuary are leopard, brown bear, ibex, bharal, musk deer, snow cock, jungle fowl, vultures and pheasants.

Rupi Bhaba Wildlife Sanctuary

This sanctuary covers an area of about 125 sq kms in the upper Satluj catchment of north-eastern Himachal Pradesh.

This sanctuary is the home of many interesting species of mammals and birds. These include leopard, civet cat, jackal, ibex, ghoral, musk deer, snow cock, monal pheasant, kites and vultures.

Kais Wildlife Sanctuary

Set up in 1954 in Kullu district, this sanctuary covers an area of 13.7 sq kms.

This sanctuary is the home of leopard, black bear, brown bear, musk deer and many interesting species of birds.

Nargu and Winch Wildlife Sanctuary

This sanctuary was set up in 1970. It covers an area of about 278 sq kms in central Himachal Pradesh.

Amongst the animals and birds found in this sanctuary are leopard, black and brown bear, musk deer, pheasants, jays, tits, warblers and eagles.

Manali Wildlife Sanctuary

The Manali sanctuary was set up in 1954. It includes a 31 sq kms area of the upper catchment of the Beas river around Manali town.

This sanctuary is the home of many interesting species of animals and birds. Amongst these are leopard, civet cat, musk deer, serow, western tragopan, monal pheasant, snow cock, eagles and vultures.

Kanawar Wildlife Sanctuary

This is a small sanctuary having an area of about 8 sq kms located to the east of Kullu town in the catchment of the river Parbati, a tributary of the river Beas. The elevation ranges from 1800 mts to 4800 mts. It was set up in 1954.

This sanctuary is the home of leopard, tahr, serow, ghoral, musk deer, koklar, khali, cheer and western tragopan pheasants.

Khokan Wildlife Sanctuary

The Khokan wildlife sanctuary was set up in 1954. It covers a 13 sq kms area of Kullu district.

This sanctuary is the home of leopard, jungle cat, black bear and many species of birds.

Daranghati Wildlife Sanctuary

The Daranghati sanctuary covers a 167 sq kms area in Kinnaur district. It was set up in 1974.

Amongst the main animals and birds found in this sanctuary are leopard, civet cat, marten, brown and black bears, musk deer, ibex, ghoral, monal, khalij and koklar pheasants.

Saichutan Nallah Wildlife Sanctuary

This sanctuary was set up in Chamba district in 1974. It covers an area of about 5 sq kms.

This sanctuary is the home of leopard, musk deer, serow and many high altitude species of birds including the snow cock.

Gamgul Siyahbei Wildlife Sanctuary

This is another protected area located in Chamba district. It encompasses an area of about 9 sq kms.

This sanctuary is the home of leopard, musk deer, brown and black bear, ghoral, serow and many species of birds.

Kugti Wildlife Sanctuary

The Kugti wildlife sanctuary was set up in 1962 in Chamba district. It covers an area of about 118 sq kms. The highest point is located at an elevation of 6000 mts.

This sanctuary is the home of leopard, musk deer, barking deer, tahr, ibex, khalij, monal and western tragopan pheasants.

Tundah Wildlife Sanctuary

The Tundah wildlife sanctuary was set up in 1975 in Chamba district. It covers an area of about 64 sq kms.

This sanctuary is the home of many interesting species of

animals and birds. These include leopard, black bear, western tragopan and jungle fowl.

Churdhar Wildlife Sanctuary

This sanctuary was recently set up around Churdhar peak in south-western Himachal Pradesh. It falls within Sirmaur and Shimla districts.

This sanctuary is the home of leopard, tahr, ghoral, musk deer, barking deer and many species of high altitude birds.

UTTARAKHAND

Corbett National Park

This is the first national park of India. It is situated in the lower hills falling within Pauri and Nainital districts. Set up as the Hailey national park in 1936 after the then Governor of United Province its name was changed to Ramganga national park before being christened after Jim Corbett, the famous naturalist in 1956.

Today, the park encompasses an area of about 520 sq kms which includes the vast reservoir formed by the Kalagarh dam across the river Ramganga. It is one of the best managed protected areas in the country and attracts thousands of visitors each year. This area is also a tiger reserve under the Project Tiger.

For the purpose of management, the park area has been divided into a core zone and tourist zone. A buffer zone is being created around the park. It will include forests of the adjoining forest divisions.

The park encompasses the Patli dun valley formed by river Ramganga. The lower Himalayan hills lie to the north while the Siwalik hills are to the south. In between these hills flows the river Ramganga. A number of seasonal streams or *sots* drain this area.

A typical sub-tropical climate prevails in the park area. The SW monsoons cause heavy and widespread rains from July to September. Winters are cold and frosty. It becomes very hot during the summer months and the temperature may rise to over 38°C.

This park is the home of tiger whose numbers have gone up due to the strict protection measures. Many elephant herds also live

in this park while others migrate to and from the adjoining tracts from time to time. Other mammals found here include leopard, jackal, wild boar, sambhar, spotted deer, hog deer, barking deer, Hanuman monkey and langur. Amongst the birds found in this park are the jungle fowl, woodpeckers, tits, warblers and pheasants. The vast reservoir is the home of many resident and migratory aquatic birds. The reptiles include gharial, mugger, Indian rock python, king cobra, cobra, Russell's viper and common krait.

Nanda Devi National Park

This is a 630 sq kms national park set up in 1980 in the higher Himalaya to conserve the unique flora and fauna of the area around Nanda Devi peak. The park area can be approached from Joshimath or Nand Paryag in Chamoli district. A difficult trek has to be endured to reach this national park.

The tract comprises of high snow-clad peaks, glaciers, moraines and deep gorges. The upper tracts have been influenced by glacial action while running water has shaped the geomorphic features of the lower hills.

The climatic conditions vary from temperate to arctic. Precipitation is both in the form of rain and snow. The SW monsoons account for bulk of total annual rainfall. Very heavy snowfall occurs in the winter season. Summers are mild and pleasant.

The Nanda Devi national park is the home of many high altitude animal and bird species. Amongst these are snow leopard (not resident), leopard, civet cat, bharal, ghoral, serow, musk deer, snow cock, khalij pheasant, kites and vultures.

Valley of Flowers National Park

Also known as the Pushpawati national park after the river of that name which flows through the famous high altitude valley of flowers. This 87 sq kms national park was set up in 1981 in the higher Himalaya of Garhwal. According to a legend, the river was named Pushpawati by the Pandavas when they saw flowers floating on the waters of this snowfed river. The valley of flowers is a high altitude valley located just below the snowy peaks in Chamoli district. It is approached from Vishnu Paryag near Joshimath.

This national park is the home of leopard, civet cat, tahr, serow, musk deer, snow cock, khalij pheasant, vultures and eagles.

Rajaji National Park

The Rajaji national park was constituted in the early eighties after merging the following wildlife sanctuaries of the foothills of Garhwal: (1) Motichur sanctuary of Dehradun district, (2) Rajaji sanctuary of Hardwar district, and (3) Chilla sanctuary of Pauri district. It is situated in the southern part of the Dehradun valley and encompasses an area of about 824 sq kms.

This national park is the home of tiger, leopard, elephant, sambhar, cheetal, hog deer, barking deer, wild boar, porcupine and many species of birds. This national park is the western limit of elephant and tiger.

Govind Pashu Vihar Sanctuary

This is a high altitude sanctuary situated in the upper reaches of the river Tons in Uttarkashi district. In fact this river originates as the river Rupin in the snowy wastes of this sanctuary. The area is known as Har-ki-Dun or the valley of gods. This sanctuary is approached after an arduous trek along the Rupin valley from Naitwar. A small forest rest-house situated amidst the snows is the only human shelter available in this sanctuary.

The Govind Pashu Vihar sanctuary is the home of many interesting high altitude species of birds and animals. Amongst these are leopard, civet cat, musk deer, barking deer, Himalayan tahr, ghoral, bharal, snow cock, snow partridge and monal pheasant.

Kedarnath Musk Deer Sanctuary

This is a 967 sq kms sanctuary encompassing the upper catchment of the Mandakini river in Garhwal Himalaya. It was set up primarily for affording protection to the musk deer. The Mandakini river is a tributary of the Alaknanda river.

This sanctuary is a typical habitat for the musk deer. Efforts are on to increase its population. A musk deer breeding station set up in this area has given good results. Other mammals found in this sanctuary include leopard, civet cat, jungle cat, wolf, hyaena,

barking deer, serow, ghoral, black and brown bear. Amongst the prominent birds are the monal, cheer pheasant, khaliij pheasant, red jungle fowl, falcon and snow cock.

Ascot Musk Deer Wildlife Sanctuary

This is a 284 sq kms sanctuary located in the Pithoragarh area of higher Kumaun, near the border with Tibet. This sanctuary has been set up primarily to conserve the musk deer and its habitat.

This sanctuary is the home of musk deer. Efforts are on to conserve this elusive species. Other mammals found in this sanctuary include leopard, jungle cat, civet cat, barking deer, serow, ghoral and brown bear. Many species of high altitude birds are also found in Askot sanctuary.

Sona Nadi Sanctuary

This is a 200 sq kms sanctuary located along the foothills of Kotdwara. It has been created to serve as a corridor for the migration of animals between the Corbett national park in the east and the Rajaji national park in the west.

This sanctuary is the home of tiger, leopard, elephant, cheetal, sambhar, hog deer, barking deer, wild boar, porcupine, common langur and many species of birds.

Binsar Wildlife Sanctuary

The Binsar sanctuary is situated in the higher Himalaya near Almora in Kumaun. It encompasses an area of about 50 sq kms. The tract is considered to be one of the most beautiful areas of Uttarakhand.

This sanctuary is the home of many high altitude species of animals and birds which include leopard, civet cat, serow, ghoral, musk deer, brown bear and khaliij pheasant.

Uttarakhand Biosphere Reserve

The eight hill district of Uttar Pradesh, viz, Uttarkashi, Dehradun, Tehri, Chamoli, Pauri, Almora, Nainital and Pithoragarh constitute the region known as Uttarakhand. It is the easternmost end of the western Himalaya bounded in the east by Nepal, in the north lies

Tibet, in the west is Himachal Pradesh, and the plains of Uttar Pradesh lie to its south.

The Uttarakhand biosphere reserve covers an area of about 3942 sq kms falling within parts of Tehri, Uttarkashi, Chamoli and Almora districts. The main characteristics of this biosphere reserve have been outlined below:

- (1) This tract is a transition zone between the relatively drier tracts of the Himalaya in the west and the moister parts in the east.
- (2) It includes three physiographic units of the Himalaya, viz, the lower, higher and trans-Himalayan regions.
- (3) The vast tracts of natural forest with a relatively low biotic pressure conforms to the international criterion for biosphere reserves.
- (4) A wide variety of forest types ranging from temperate forests at lower elevation to moist alpine pasture near the snowline are found in this biosphere reserve.
- (5) Both the floral and faunal elements found in this tract represent the transition between the elements of the western and eastern Himalaya.
- (6) This is the home of almost 3 percent of the avifauna of the world bearing affinity to both the Sino-Himalayan regions.
- (7) The rivers Ganga and Yamuna originate in the glaciers falling within this biosphere reserve.
- (8) The rock strata of this tract ranges from pre-Cambrian to recent age.
- (9) This tract is also of archaeological importance. Human dwelling as old as 500 B.C. have been found in this area.

The following types of mammals, birds, reptiles and fishes are found in this area:

(a) *Mammals*—Yak, Ibex, Snow leopard, Great Tibetan sheep, Himalayan tahr, Himalayan weasel, Royle's vole, Brown bear, Black bear, Common otter, Himalayan mouse hare, Stone marten, Jackal, Ghoral, Musk deer, Barking deer, Wild boar, Indian porcupine, Indian hare, Himalayan yellow-throated marten, Smooth Indian otter, Red fox, Panther, Leopard cat, Jungle cat, Himalayan palm civet, Common mongoose, Indian fox, and Indian wild dog.

(b) *Birds*—Western tragopan, Crimson tragopan, Cheer pheasant, Slaty-headed parakeet, Himalayan pied woodpecker, Brown-fronted pied woodpecker, Striated laughing thrush, Black kite, Goshawk, Sparrow hawk, Spotted owl, Long-legged buzzard, Twite, Cross bill, Long-eared owl, Osprey, House sparrow, Crimson-horned tragopan, Red jungle fowl, Monal pheasant, Khalij pheasant, Red-billed babbler, Variegated laughing thrush, Black-capped sibia, Brown-crested tit, Red-browed finch, Red-headed bull finch, and Pink-browed rose finch.

(c) *Reptiles*—King cobra, Cobra, Himalayan pit viper, and Common house gecko.

(d) *Fishes*—Yellow-finned mahaseer, Red-finned mahaseer, Kali machhi, and Hill trout.

Nanda Devi Biosphere Reserve

The Nanda Devi biosphere reserve is situated in the higher Himalaya of Uttarakhand along the border of Garhwal and Kumaun divisions. The Nanda Devi national park falls within this biosphere reserve.

The Nanda Devi group of peaks which include the Nanda Devi, Nanda Devi east and Nanda Kot form a towering wall in the north. At the base of this massif lies the Pindari glacier from which rises the Pindar river that joins the river Alaknanda. This tract is relatively inaccessible and hence the forests are dense and less disturbed.

The following types of mammals, birds and reptiles are found in this area.

(a) *Mammals*—Leopard, Jungle cat, Small Indian civet, Wolf, Brown bear, Clawless otter, Himalayan weasel, Bharal, Ibex, Himalayan tahr, Serow, and Ghoral.

(b) *Birds*—Monal pheasant, Khalij pheasant, Wood cock, Snow cock, Hill pigeon, Myna, Himalayan tree creeper, Himalayan woodpecker, and Indian cuckoo.

(c) *Reptiles*—Fan-throated lizard, Asian house gecko, Trinket snake, Rat snake, Royal snake, Slender coral snake, and King cobra.

NEPAL

Royal Chitwan National Park

This is the first national park of Nepal that was set up in the year 1973. It encompasses an area of 932 sq kms of Rapti dun valley south of Kathmandu near the border with India. The river Rapti forms the northern boundary of this area while the river Reu flows towards south and its western boundary is formed by the Narayani river.

The terrain consists of a typical dun type valley lying between the low rolling Siwalik hills in the south and the lower Himalaya in the north. In the longitudinal valley flows the Rapti river and its tributaries. The south-facing slopes of the lower Himalaya are more steep than the north-facing slopes of the Siwalik hills. The slope is gentle in the valley and varies to very steep all along the Himalayan foothills.

The rivers and streams flowing within this area have a tendency to change their course. They are also in spate during the rainy season. This has led to the formation of small waterbodies, swamps, marshes and grasslands.

The SW monsoons cause widespread rain in this tract. The rainy season extends from the end of June to the middle of September. Autumn is the best season to visit this national park. Winters are cold and the temperature may drop down to below 5°C. Frost occurs regularly all through the winter season. Spring is pleasant. Summers are hot and dry. The mercury may soar to over 38°C during this season.

The swamps and grasslands have created excellent habitat conditions for the Indian one-horned rhinoceros. The Chitwan national park is the westernmost area in which this species is found today. It is believed that in the past the rhinoceros thrived in the plains of Punjab and Sind. Other animals found in this park are tiger, leopard, black bear, nilgai, cheetal, porcupine and wild boar.

This national park is also the home of many species of khalij pheasant, cheer pheasant, red jungle fowl, pea fowl, jays and nut-crackers. The gangetic dolphin, gharial and crocodile thrive in the lakes and rivers of Chitwan national park.

Sagarmatha National Park

Also known as the Everest national park, this fan-shaped area encompasses the south-facing slopes of the world's loftiest peak Mount Everest. Situated in the north-eastern part of the higher Himalaya of Nepal, this national park covers the upper catchment of the river Dudh Kosi. It is the home of ethnic sherpa community famous all over the world for their mountaineering skills and achievements.

A large area of the Sagarmatha national park is situated above an elevation of 3000 mts. The terrain is made up of hanging valleys, glacial amphitheatres, razor-sharp ridges, moraines and both V- and U-shaped valleys with snowfed rivers flowing in the depths below. The slopes vary from steep to precipitous.

Arctic to sub-arctic climatic conditions prevail in this region. Winters are very cold and heavy snowfall occurs at regular intervals. The temperature remains below the freezing point for long periods. The snow begins to melt in late March or early April. The weather improves in May and June during which period the mercury rises to about 25°C. Monsoon rains lash the tract from early July to mid-September. Autumn is very short and winter sets in around mid-October when the season's first snowfall is received.

The main animals found in this national park include snow leopard, leopard, musk deer, Himalayan tahr, serow, ibex, markhor and marten. Amongst the birds are tits and warblers, kites, eagles, pheasants, fowls and buntings.

Langtang National Park

This is the largest national park of Nepal. It covers an area of 1710 sq kms in the Langtang valley about 64 kms north of Kathmandu. A number of peaks towering to altitudes of over 6500 mts hem this park, viz, Ligung, Dorjee Lagpa and Phaubi Chyahu.

The terrain is made up of glacial valleys, moraines, ridges, spurs, river terraces and deep gorges. Slope varies from very steep to precipitous.

Temperate to arctic climatic conditions prevail in this tract. Winters are very severe. Snow may lie on the ground for several weeks at a stretch. Summers are short and the maximum temperature

is about 32°C in the valleys and 25°C in the upper reaches. The SW monsoons cause heavy rains.

The Langtang national park is the home of leopard, black bear, brown bear, wild boar, musk deer, Himalayan tahr and serow. Amongst the birds found in this national park are monal, khali pheasant, chakor, and grey partridge.

Lake Rara National Park

Lake Rara is a small lake having an area of about 10 sq kms. It is situated at an elevation of about 3000 mts at a distance of 370 kms to the north-west of Kathmandu. This national park covers an area of about 106 sq kms. Snow may lie on the ground for several weeks at a stretch.

The main mammals found in the Lake Rara national park are the Himalayan black bear, snow leopard, and a number of species of mountain goat and sheep. This tract is also the home of a large number of both terrestrial and aquatic birds which include the snow cock, khali pheasant, eagle, kite and jungle fowl.

Shey National Park

The Shey national park was set up recently in the Dolpa district of western Nepal with a view to afford protection to the unique flora and fauna of the trans-Himalayan tract. It encompasses an area of about 2000 sq kms which includes the famous lake Phuksundo.

The prominent animals living in this national park are the leopard, snow leopard, Tibetan wild ass or kiang, nayan, bhara, ibex, markhor, serow, ghoral chiru, musk deer, yellow-throated marten and brown bear. Amongst the birds are the snow cock, eagle and partridge.

Royal Sukla-Phanta Wildlife Reserve

This wildlife reserve is situated in the south-western part of Nepal. It covers an area of 155 sq kms.

This rare combination of terrain and vegetation is best suited for different species of deers. The Sukla-Phanta wildlife reserve is the home of a large population of swamp deer, spotted deer, hog deer and nilgai or blue bull. Other animals which live in this reserve

include tiger, leopard, wild boar, porcupine. Elephant herds may also migrate through this tract.

There is a small lake near the eastern periphery of this reserve. Together with the swampy areas found in the area, this lake plays host to many species of resident and migratory aquatic birds which include water fowls, ducks, geese and cranes.

Kosi Tapu Wildlife Reserve

This wildlife reserve encompasses the extensive flood plains formed by the river Kosi in the terai tract of Sunsari district. It has an area of 65 sq kms.

Savannah grasslands and dense terai forests serve as an excellent habitat for the Asiatic wild buffalo. Other animals found in this wildlife reserve are tiger, leopard, swamp deer, spotted deer, nilgai, elephant and crocodile. Amongst the bird species are tits, pheasants and fowls. A vast reservoir formed by a dam across the river Kosi serves as a home for many interesting species of local and migratory birds.

Royal Karnali Wildlife Reserve

The Royal Karnali wildlife reserve encompasses a 358 sq kms area along the eastern bank of the Karnali river in the foothills of Bordaia district.

This wildlife reserve is the home of tiger, leopard, elephant, gaur, spotted deer, nilgai, and many species of birds, gangetic crocodiles and fishes.

EASTERN HIMALAYA

Jaldapara Wildlife Sanctuary

This area was set up as a sanctuary in 1943. It is situated at the base of the Bhutan hills in West Bengal and covers an area of about 115 sq kms.

This sanctuary is famous for the great Indian one-horned rhinoceros. Other animals found in this area are tiger, leopard, elephant, gaur, sambhar, muntjac and hog deer. Amongst the principal bird species found in this area are the Bengal florican and herons.

Singalila Wildlife Sanctuary

This is a 79 sq kms protected area situated in the extreme north-western corner of the north Bengal hills near the border with Sikkim and Nepal.

Buxa Wildlife Sanctuary

This is a 745 sq km sanctuary at the foot of the Bhutan hills near the junction of Bhutan, Assam and north Bengal. The core area has an extent of about 313 sq kms. The river Sankosh forms the eastern boundary of this sanctuary. It is a tiger reserve under the 'Project Tiger'. The Buxa sanctuary serves as a vital corridor for elephants migrating between the forests of Assam in the east and Bhutan in the north.

This sanctuary is the home of tiger, leopard, elephant, gaur, sloth bear, sambhar and many species of birds and fishes.

Kangchendzonga National Park

This is Sikkim's only national park situated in the north-western part of the state. It was set up in 1977 and covers an area of about 850 sq kms. The Indo-Nepal border forms the western border of this national park. A number of towering peaks lie in the Kangchendzonga national park. These include the Kangchendzonga (8586 mts); Kabur north and south; Tent and Nepal which are amongst the highest peaks in the world. To the north is the famous Zemu glacier from which flows the Zemu river that forms the river Teesta.

Arctic to sub-arctic conditions prevail at higher elevations while a temperate climate is experienced down below. The SW monsoons cause heavy and widespread rains from June to mid-September. Winters are cold and heavy snowfall occurs in the upper reaches. The temperature remains below the freezing point for long periods.

This national park is the home of many high altitude mammals and birds. These include leopard, clouded leopard, snow leopard, red panda, binturong, tahr, musk deer, bharal, serow, snow cock, pheasants, vultures and eagles.

Maenam Wildlife Sanctuary

This is a 60 sq kms sanctuary situated in the lower Himalaya of

Sikkim to the east of Gangtok.

This sanctuary is the home of leopard, bharal, serow, binturong, flying fox and many interesting species of eastern Himalayan birds.

Fambong Lho Wildlife Sanctuary

This is a 57 sq kms sanctuary situated to the north-west of Gangtok in the lower Himalaya of Sikkim.

This sanctuary is the home of leopard, hyaena, jackal, tahr, serow, flying fox and many interesting species of eastern Himalayan birds.

Singha Wildlife Sanctuary

Also known as the Singha rhododendron sanctuary, this protected area was set up primarily for the conservation of rhododendron forests and the fauna living in them. It encompasses an area of about two kms near Gangtok.

This sanctuary is the home of many interesting species of animals and birds.

Kyongnosla Wildlife Sanctuary

Also known as the Kyongnosla alpine sanctuary, this protected area covers an area of about four sq kms in the alpine zone of Sikkim. There is a proposal to enlarge its extent to about 25 sq kms.

This sanctuary is the home of leopard, clouded leopard, civet cat, fox, bear, tahr, serow and many species of birds.

Doga National Park

This is a relatively smaller protected area lying in central Bhutan. It was constituted into a national park to preserve the unique combination of forest-clad mountain slopes, raging torrents and beautiful animals and birds.

Temperate to arctic climatic conditions prevail in this area. Summers are mild and the mean maximum temperature does not usually exceed 32°C. The SW monsoons cause heavy rains. Winters are very severe and heavy snowfall occurs in the upper reaches.

The Doga national park is the home of a large variety of animals and birds. Ghoral and bharal abound near the Dobjidzong. Other mammals include the two species of Himalayan bears, barking deer, musk deer, wild boar and leopard cat. Amongst the birds are a number of pheasants, eagles and kites.

Manas Sanctuary

This is Bhutan's oldest wildlife sanctuary. It was created by the Royal Government of Bhutan way back in 1966. The Manas sanctuary of Bhutan encompasses a total area of about 250 sq kms along the banks of the river Manas, which for some distance forms the Indo-Bhutan border. The Manas sanctuary of India extends along the other bank of the river Manas.

The Manas sanctuary is the home of a large population of elephants, rhinoceros and wild buffalo. Other mammals found in this sanctuary are tiger, leopard, jungle cat, golden cat, barking deer, sambhar, wild boar, wild dog and many species of primates including the famous golden langur. A large variety of birds, reptiles and fishes are also found in this sanctuary.

Jigme Dorji Wildlife Sanctuary

The present Jigme Dorji sanctuary was formed in 1979 by incorporating the areas of the following three sanctuaries that were set up by the Royal Government of Bhutan in 1974: (1) Laya wildlife sanctuary, (2) Gasa wildlife sanctuary, and (3) Jigme Dorji sanctuary.

This sanctuary is the largest protected area of Bhutan. It encompasses an area of almost 4000 sq kms and includes virtually the entire northern part of the country. The northern parts of this sanctuary are virtually devoid of a vegetative cover due to extremely cold conditions.

This sanctuary is the home of many species of wild goats and sheep. These include blue sheep, takin, tahr and ghoral. Other prominent animals found in this sanctuary are musk deer, black bear, snow leopard, leopard, Himalayan panda and wild boar. Many interesting species of birds live in this sanctuary. Amongst these are blood pheasants and monal.

Namdhapa National Park

This national park was set up in Arunachal Pradesh as a protected area in 1972. It encompasses a total area of about 1807 sq kms with a proposed extension of another 150 sq kms. The Namdhapa national park is also a tiger reserve under the Project Tiger. This is perhaps the only protected area where all the four major predators of the Himalaya, viz, tiger, leopard, clouded leopard and snow leopard are found. This national park covers a wide spectrum of flora and fauna. The altitude ranges from 200 mts in the southern tract to about 4500 mts in the north.

This national park can aptly be divided into the following geomorphic zones (from south to north): (1) Outer Himalaya—consisting of low rolling hills that extend all along the Himalayan range, (2) Lower Himalaya—these are foothills of the main Himalayan mountain wall, and (3) Main Himalaya—this is the main Himalayan wall. It comprises of a number of towering snow-clad peaks.

The climatic conditions vary from tropical to sub-tropical in the southern tract to arctic in the north. The SW monsoons cause heavy and widespread rains in the entire area from June to September. Autumn is sunny and fair. Winters are mild at lower elevations but the upper reaches experience a severe winter. Heavy snowfall occurs above elevations of over 2800 mts. In summer the temperature may rise to about 40°C in the southern tract while it is not very hot in areas of high elevation.

This national park is the home of tiger, leopard, clouded leopard, snow leopard, hyaena, gaur, ghoral, takin, musk deer, hoolock, gibbon, slow loris, binturong and red panda. Amongst the prominent birds are hornbilled duck, tits, warblers and pheasants.

Moiling National Park

This national park lies in the Subansiri-Siang tract of Arunachal Pradesh and encompasses an area of about 700 sq kms.

This sanctuary is the home of many interesting species of mammals and birds. Amongst these are tiger, leopard, ghoral, musk deer, takin, pheasants, tits and warblers.

Pakhui Wildlife Sanctuary

This sanctuary covers an area of about 862 sq kms in the south-western part of Arunachal Pradesh. It includes the Dafla hills at the base of the eastern Himalaya. This area was created as a sanctuary in 1977.

Amongst the prominent animals and birds found in this sanctuary are tiger, leopard, elephant, sloth bear, slow loris, otters, ducks and fowls.

Itanagar Wildlife Sanctuary

This is a 140 sq kms sanctuary situated in the lower hills of Arunachal Pradesh near Itanagar.

This sanctuary is the home of leopard, jungle cat, wild buffalo, sloth bear, slow loris and many species of birds.

Mahad Wildlife Sanctuary

This sanctuary is located in the Mishimi hills tract of Arunachal Pradesh. It was set up in 1980. The Mahad sanctuary extends from the lower hills at an elevation of 400 mts to 3500 mts.

This sanctuary is the home of clouded leopard, leopard cat, jungle cat, hoolock gibbon, musk deer, spotted linsang and swamp deer.

D'ering Wildlife Sanctuary

The D'ering wildlife sanctuary is the home of a large variety of animals and birds. These include wild buffalo, leopard, swamp deer, pheasants and migratory water fowl.

Namdhapa Biosphere Reserve

The Namdhapa biosphere reserve constitutes one of the ecologically richest biotic communities in India. It is located in Lohit and Tirap districts in the south-eastern part of Arunachal Pradesh.

The Namche Barwa peak is considered to be the eastern limit of the Himalayan mountain chain. South-east of this tract there occur a series of low mountains believed to be the transition zone between the Himalaya and the Arakan Yoma mountains. The western slopes of these mountains fall within the drainage of the

Brahmaputra river system. The Dapha Bum ridge occurs in the northern part of these transitional mountains. The highest peaks on this ridge rise to elevations of over 4500 mts. It separates the Nao Dihing or Diyun basin from the Lohit basin that lies further towards north.

A typical tropical to sub-tropical monsoon climate prevails over this tract. Rainfall is very heavy and bulk of the total annual precipitation is received from late May to mid-September. Summers are hot and the temperature in the lower reaches may soar to about 40°C. Winters are fairly cold particularly at higher elevations where snowfall may cover the ground for several weeks from December to February.

The animals found in this biosphere reserve are:

(a) *Mammals*—Tiger, Leopard, Clouded leopard, Snow leopard, Marbled cat, Golden cat, Leopard cat, Fishing cat, Jungle cat, Hoolock monkey, Slow loris, Capped langur, Assamese macaque, Stump-tailed macaque, Common langur, Spotted linsang or Tiger civet, Large Indian civet, Small Indian civet, Common palm civet, Bear cat, Himalayan palm civet, Himalayan yellow-throated marten, Clawless otter, Red panda, Malayan sun bear, Sloth bear, Himalayan black bear, Common mongoose, Crab-eating mongoose, Orange-bellied Himalayan squirrel, Indian giant squirrel, Common giant flying squirrel, Indian wild dog, Jackal, Malay tree shrew, Hog deer, Sambhar, Musk deer, Indian porcupine, Brush-tailed porcupine, Hodgson's porcupine, Chinese pangolin, Hog badger, Himalayan mouse hare, Gaur, Himalayan tahr, Serow, Ghoral, and Takin.

(b) *Birds*—Giant heron, Hodgson's hawk eagle, Black eagle, Grey-headed fishing eagle, Crested serpent eagle, Shahin, Hobby, Kestrel, Common hill partridge, Khalij, Jungle fowl, Peacock pheasant, Pin-tailed green pigeon, Green imperial pigeon, Spotted dove, Emerald dove, Barred owlet, Palm swift, Red-headed trogon, Broad-billed roller, Great Indian hornbill, Hill barbet, Blue-throated barbet, Speckled piculet, Rufous piculet, Rufous woodpecker, Yellow-naped woodpecker, Bush lark, Grey-backed shrike, Black-headed oriole, Bronzed drongo, Ashy swallow shrike, Grey-headed myna, Common myna, Jungle myna, Green magpie, Himalayan

tree pie, Jungle crow, Flycatcher shrike, Scarlet minivet, Iora, Leaf bird, Fairy bluebird, Red-vented bulbul, Black bulbul, Wren babbler, Black-throated babbler, Jungle babbler, Ogle's laughing thrush, Rufous-necked laughing thrush, Silver-eared mesia, White-headed shrike babbler, Quaker babbler, Chestnut-backed sibia, Large niltava, Small niltava, Rufous-bellied niltava, White-throated fantail, Flycatcher, Marsh warbler, Lesser shortwing, Magpie robin, Daurian redstart, Sultan tit, Grey tit, Tree pipit, Black-breasted sunbird, Spider-hunter, and Tree sparrow.

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