

BIODIVERSITY HOTSPOTS IN INDIA

1. **Himalaya:** Includes the entire Indian Himalayan region (and that falling in Pakistan, Tibet, Nepal, Bhutan, China and Myanmar)
2. **Indo-Burma:** Includes entire North-eastern India, except Assam and Andaman group of Islands (and Myanmar, Thailand, Vietnam, Laos, Cambodia and southern China)
3. **Sundalands:** Includes Nicobar group of Islands (and Indonesia, Malaysia, Singapore, Brunei, Philippines)
4. **Western Ghats and Sri Lanka:** Includes entire Western Ghats (and Sri Lanka)

1. HIMALAYA



The Himalaya Hotspot is home to the world's highest mountains, including Mt. Everest. The mountains rise abruptly, resulting in a diversity of ecosystems that range from alluvial grasslands and subtropical broadleaf forests to alpine meadows above the tree line. Vascular plants have even been recorded at more than 6,000 m. The hotspot is home to important populations of numerous large birds and mammals, including vultures, tigers, elephants, rhinos and wild water buffalo.

VITAL SIGNS

Hotspot Original Extent (km ²)	741,706
Hotspot Vegetation Remaining (km ²)	185,427
Endemic Plant Species	3,160
Endemic Threatened Birds	8
Endemic Threatened Mammals	4
Endemic Threatened Amphibians	4
Extinct Species†	0
Human Population Density (people/km ²)	123
Area Protected (km ²)	112,578
Area Protected (km ²) in Categories I-IV*	77,739

†Recorded extinctions since 1500. *Categories I-IV afford higher levels of protection

OVERVIEW

Stretching in an arc over 3,000 kilometers of northern Pakistan, Nepal, Bhutan and the northwestern and northeastern states of India, the Himalaya hotspot includes all of the world's mountain peaks higher than 8,000 meters. This includes the world's highest mountain, Sagarmatha (Mt. Everest) as well as several of the world's deepest river gorges.

This immense mountain range, which covers nearly 750,000 km², has been divided into two regions: the Eastern Himalaya, which covers parts of Nepal, Bhutan, the northeast Indian states of West Bengal, Sikkim, Assam, and Arunachal Pradesh, southeast Tibet (Autonomous Region of China), and northern Myanmar; and the Western Himalaya, covering the Kumaon-Garhwal, northwest Kashmir, and northern Pakistan. While these divisions are largely artificial, the deep defile carved by the antecedent Kali Gandaki River between the Annapurna and Dhaulagiri mountains has been an effective dispersal barrier to many species.

The abrupt rise of the Himalayan Mountains from less than 500 m to more than 8,000 m results in a diversity of ecosystems that range, in only a couple of hundred kilometers, from alluvial grasslands (among the tallest in the world) and subtropical broadleaf forests along the foothills to temperate broadleaf forests in the mid hills, mixed conifer and conifer forests in the higher hills, and alpine meadows above the tree line.

SPECIES DIVERSITY AND ENDEMISM

Taxonomic Group	Species	Endemic Species	Endemism (%)
Plants	10,000	3,160	31.6
Mammals	300	12	4.0
Birds	977	15	1.5
Reptiles	176	48	27.3
Amphibians	105	42	40.0
Freshwater Fishes	269	33	12.3

Biogeographically, the Himalayan Mountain Range straddles a transition zone between the Palearctic and Indo-Malayan realms. Species from both realms are represented in the hotspot. In addition, geological, climatic and altitudinal variations in the hotspot, as well as topographic complexity, contribute to the biological diversity of the mountains along their east-west and north-south axes.

PLANTS

Of the estimated 10,000 species of plants in the Himalaya hotspot, about 3,160 are endemic, as are 71 genera. Furthermore, five plant families are endemic to the region, the Tetracentraceae, Hamamelidaceae, Circaeasteraceae, Butomaceae and Stachyuraceae. The largest family of flowering plants in the hotspot is the Orchidaceae, with 750 species, and a large number of orchids, many representing rather young endemic species, have recently been reported from the hotspot, indicating that further exploration will probably reveal a much higher degree of plant endemism. The Eastern Himalaya is also a center of diversity for several widely distributed plant taxa, such as *Rhododendron*, *Primula*, and *Pedicularis*.

In the Himalaya Hotspot, a zone of permanent rock and ice begins at about 5,500–6,000 m; in spite of these harsh conditions, there are records of vascular plants occurring at some of the highest elevations on Earth. Cushion plants have been recorded at more than 6,100 m, while a high-altitude scree plant in the mustard family, ***Ermania himalayensis***, was found at 6,300 m on the slopes of Mt. Kamet in the northwestern Himalayas.

THREATS

Human Impacts

Despite their apparent remoteness and inaccessibility, the Himalayas have not been spared human-induced biodiversity loss. People have lived in the mountains of the Himalayas for thousands of years. In recent decades, greater access to the global market has increased the demand for natural resources in the area encouraged both immigration from outside (such as Arunachal Pradesh) and movement within the region (such as in Nepal). As a result, populations are growing in the most productive ecosystems, which are also some of the richest in biodiversity.

Today, remaining habitat in the Himalaya is patchy. The steadily increasing population in the hotspot has led to extensive clearing of forests and grasslands for cultivation, and widespread logging. Both legal and illegal logging often occurs on extremely steep slopes, resulting in severe erosion. Although cultivation has a general upper limit of about 2,100 m on slopes exposed to monsoons, people farm crops such as barley, potato and buckwheat at high elevations in the inner valleys and trans-montane regions, and in some areas such as Jumla, Kashmir, Lahoul, and Ladakh, there are major agriculturally based population centers well above this elevation. The land is also often cleared in the summer months for livestock; the use of fire to clear land poses an additional threat to forest land, as fires sometimes spread out of control. The conversion of forests and grasslands for agriculture and settlements has led to large-scale deforestation and habitat fragmentation in Nepal, and in the Indian States of Sikkim, Darjeeling, and Assam.

Large areas of remaining habitat in the hotspot are highly degraded. Overgrazing by domestic livestock, including cattle and domesticated yak, is widespread in the lowlands and alpine ecosystems. The flora of fragile alpine meadows has been overexploited for traditional medicine (because medicinal plant collectors invariably uproot the entire plant, regrowth is retarded). Fuelwood collection and non-timber forest product extraction, both for domestic consumption and export, has inflicted severe damage to some forest ecosystems. Unplanned and poorly managed

tourism has led to environmental deterioration. Political unrest, often in the form of insurgencies, also threatens the integrity of some protected areas.

In addition to habitat loss and degradation – which has led to perhaps no more than 25% of the original vegetation in this hotspot still intact – poaching is a serious problem in the Himalayan Mountains, with tigers and rhinoceros hunted for their body parts for traditional Chinese medicine, while snow leopards (***Uncia uncia***, EN) and red pandas (***Ailurus fulgens***, EN) are sought for their beautiful pelts.

Other threats to biodiversity and forest integrity include mining, the construction of roads and large dams, and pollution due to the use of agrochemicals.

2. INDO-BURMA



Encompassing more than 2 million km² of tropical Asia, Indo-Burma is still revealing its biological treasures. Six large mammal species have been discovered in the last 12 years: the large-antlered

muntjac, the Annamite muntjac, the grey-shanked douc, the Annamite striped rabbit, the leaf deer, and the saola.

This hotspot also holds remarkable endemism in freshwater turtle species, most of which are threatened with extinction, due to over-harvesting and extensive habitat loss. Bird life in Indo-Burma is also incredibly diverse, holding almost 1,300 different bird species, including the threatened white-eared night-heron, the grey-crowned crocias, and the orange-necked partridge.

VITAL SIGNS

Hotspot Original Extent (km ²)	2,373,057
Hotspot Vegetation Remaining (km ²)	118,653
Endemic Plant Species	7,000
Endemic Threatened Birds	18
Endemic Threatened Mammals	25
Endemic Threatened Amphibians	35
Extinct Species†	1
Human Population Density (people/km ²)	134
Area Protected (km ²)	235,758
Area Protected (km ²) in Categories I-IV*	132,283

†Recorded extinctions since 1500. *Categories I-IV afford higher levels of protection.

OVERVIEW

The Indo-Burma hotspot encompasses 2,373,000 km² of tropical Asia east of the Ganges-Brahmaputra lowlands. Formerly including the Himalaya chain and the associated foothills in Nepal, Bhutan and India, the Indo-Burma hotspot has now been more narrowly redefined as the Indo-Chinese subregion. The hotspot contains the Lower Mekong catchment. It begins in eastern Bangladesh and then extends across north-eastern India, south of the Brahmaputra River, to encompass nearly all of Myanmar, part of southern and western Yunnan Province in China, all of the Lao People's Democratic Republic, Cambodia and Vietnam, the vast majority of Thailand and a small part of Peninsular Malaysia. In addition, the hotspot covers the coastal lowlands of southern China (in southern Guangxi and Guangdong), as well as several offshore islands, such as

Hainan Island (of China) in the South China Sea and the Andaman Islands (of India) in the Andaman Sea. The hotspot contains the Lower Mekong catchment.

The transition to the Sundaland Hotspot in the south occurs on the Thai-Malay Peninsula, the boundary between the two hotspots is represented by the Kangar-Pattani Line, which cuts across the Thailand-Malaysia border, though some analyses indicate that the phytogeographical and zoogeographical transition between the Sundaland and Indo-Burma biotas may lie just to the north of the Isthmus of Kra, associated with a gradual change from wet seasonal evergreen dipterocarp rainforest to mixed moist deciduous forest.

Much of Indo-Burma is characterized by distinct seasonal weather patterns. During the northern winter months, dry, cool winds blow from the stable continental Asian high-pressure system, resulting in a dry period under clear skies across much of the south, center, and west of the hotspot (the dry, northeast monsoon). As the continental system weakens in spring, the wind direction reverses and air masses forming the southwest monsoon pick up moisture from the seas to the southwest and bring abundant rains as they rise over the hills and mountains.

A wide diversity of ecosystems is represented in this hotspot, including mixed wet evergreen, dry evergreen, deciduous, and montane forests. There are also patches of shrublands and woodlands on karst limestone outcrops and, in some coastal areas, scattered heath forests. In addition, a wide variety of distinctive, localized vegetation formations occur in Indo-Burma, including lowland floodplain swamps, mangroves, and seasonally inundated grasslands.

SPECIES DIVERSITY AND ENDEMISM

Taxonomic Group	Species	Endemic Species	Endemism (%)
Plants	13,500	7,000	51.9
Mammals	433	73	16.9
Birds	1,266	64	5.1
Reptiles	522	204	39.1
Amphibians	286	154	53.8
Freshwater Fishes	1,262	553	43.8

The patterns of biological diversity in Indo-Burma have resulted from the interaction of topography, past climate changes, soil characteristics, and the hotspot's patterns of seasonal rainfall. The hotspot contains many localized centers of endemism, particularly montane isolates, but also areas of lowland wet evergreen forest that were isolated at some stage, and river basins.

PLANTS

Knowledge of plant species within the Indo-Burma hotspot is uneven and is hampered by socio-political divisions and taxonomic complications. A conservative estimate of total plant diversity in the hotspot reveals about 13,500 vascular plant species, of which about 7,000 (52%) are endemic. Among the flora of the Indo-Burma Hotspot are a wide array of orchid and ginger species (there are more than 1,000 orchid species in Thailand alone) and many tropical hardwood trees, including commercially valuable dipterocarp species and teak (***Tectona grandis***).

THREATS

Human Impacts

Indo-Burma is one of the most threatened biodiversity hotspots, due to the rate of resource exploitation and habitat loss. Only about 5% of natural habitats remain in relatively pristine condition, with another 10 to 25% of the land in damaged, but ecologically functional, condition.

Indo-Burma was one of the first places where humans developed agriculture, and has a long history of using fire to clear land for agriculture and other needs. The need for agricultural products has only increased in recent years, with the expansion of both human populations and markets. This has contributed to widespread forest destruction; tree plantations (teak, rubber, oil palm) have replaced large areas of lowland forest, while coffee, tea, vegetable crops and sugarcane plantations threaten montane and hill forests. Other threats to forests include logging, mining for gems and ore, firewood collection, and charcoal production.

Aquatic ecosystems are also under intense development pressure in many areas. Freshwater floodplain swamps and wetlands are destroyed by draining for wet rice cultivation, particularly in Thailand, Myanmar and Vietnam. Rivers have been dammed in order to store water to generate electricity for countries' economic growth, or for export to neighboring countries to generate foreign exchange earnings. Damming a river section not only transforms that section into a large pond, but also reduces the temperature and oxygen content, and increases river-bed erosion and water turbidity downriver. Reservoir operation procedures result in occasional or regular flooding of sandbars, sandbanks, stretches of channel mosaic, and other habitats that would normally be exposed during the dry season, with severe impacts on nesting bird and turtle species.

Mangroves have been converted to shrimp aquacultural ponds, while intertidal mudflats have been extensively afforested with mangrove or intensely fished by lines of stack nets, which severely impacts their value as feeding habitat for migratory water birds and other species. Moreover, sand dune ecosystems are severely threatened by afforestation, for instance, with the Australian exotic **Casuarina equisetifolia**. Finally, overfishing and the increasing use of destructive fishing techniques is a significant problem in both coastal and offshore marine ecosystems.

The combination of rapid population growth and economic development has also caused overexploitation of natural resources to reach critical levels in the hotspot. As in the other hotspots of Southeast Asia, the wildlife trade, particularly for the food and traditional medicine markets in China, is an enormous problem for biodiversity conservation. The increasingly high value of products derived from some species has put them at risk even within strictly protected areas. The Chinese demand for turtles, snakes, tigers, and other species has depleted populations to the brink of extinction in just a few years. The volume of trade in turtles is astounding, with over ten million individuals exported to China from Southeast Asia each year. Adults, juveniles, and eggs of all species are harvested.

The threat to plants through international and domestic trade could be just as great, but there is far less accurate information; timber species, orchids, and other high value plants are particularly

at risk. Commercial logging has been particularly intense in lowland evergreen forests, to the point where few intact tracts remain and stocks of some species have been exhausted commercially.

3. SUNDALAND



The spectacular flora and fauna of the Sundaland Hotspot are succumbing to the explosive growth of industrial forestry in these islands and to the international animal trade that claims tigers, monkeys, and turtle species for food and medicine in other countries.

Populations of the orangutan, found only in this hotspot, are in dramatic decline. Some of the last refuges of two Southeast Asia rhino species are also found on the islands of Java and Sumatra.

Like many tropical areas, the forests are being cleared for commercial uses. Rubber, oil palm, and pulp production are three of the most detrimental forces facing biodiversity in the Sundaland Hotspot.

VITAL SIGNS

Hotspot Original Extent (km ²)	1,501,063
Hotspot Vegetation Remaining (km ²)	100,571
Endemic Plant Species	15,000
Endemic Threatened Birds	43
Endemic Threatened Mammals	60
Endemic Threatened Amphibians	59
Extinct Species†	4
Human Population Density (people/km ²)	153
Area Protected (km ²)	179,723
Area Protected (km ²) in Categories I-IV*	77,408

†Recorded extinctions since 1500. *Categories I-IV afford higher levels of protection.

OVERVIEW

The Sundaland hotspot covers the western half of the Indo-Malayan archipelago, an arc of some 17,000 equatorial islands, and is dominated by two of the largest islands in the world: Borneo (725,000 km²) and Sumatra (427,300 km²). More than a million years ago, the islands of Sundaland were connected to mainland Asia. As sea levels changed during the Pleistocene, this connection periodically disappeared, eventually leading to the current isolation of the islands. The topography of the hotspot ranges from the hilly and mountainous regions of Sumatra and Borneo, where Mt. Kinabalu rises to 4,101 m, to the fertile volcanic soils of Java and Bali, the former dominated by 23 active volcanoes. Granite and limestone mountains rising to 2,189 m are the backbone of the Malay Peninsula.

Politically, Sundaland covers a small portion of southern Thailand (provinces of Pattani, Yala, and Narathiwat); nearly all of Malaysia (nearly all of Peninsular Malaysia and the East Malaysian states of Sarawak and Sabah in northern Borneo); Singapore at the tip of the Malay Peninsula; all of Brunei Darussalam; and all of the western half of the megadiversity country of Indonesia, including Kalimantan (the Indonesian portion of Borneo, Sumatra, Java, and Bali). The Nicobar Islands, which are under Indian jurisdiction, are also included.

Sundaland is bordered by three hotspots. The boundary between the Sundaland Hotspot and the Indo-Burma Hotspot to the northwest is here taken as the Kangar-Pattani Line, which crosses the Thailand-Malaysia border. Wallacea lies immediately to the east of the Sundaland Hotspot, separated by the famous Wallace's Line, while the 7,100 islands of the Philippines Hotspot lie immediately to the northeast.

Lowland rainforests are dominated by the towering trees of the family Dipterocarpaceae. Sandy and rocky coastlines harbor stands of beach forest, while muddy shores are lined with mangrove forests, replaced inland by large peat swamp forests. In some places the ancient uplifted coral reefs support specialized forests tolerant of the high levels of calcium and magnesium in the soils. Infertile tertiary sandstone ridges support heath forest. Higher elevations boast montane forests thick with moss, lichens, and orchids, while further up, scrubby subalpine forests are dominated by rhododendrons. At the very tops of the highest mountain peaks, the land is mostly rocky and without much vegetation.

SPECIES DIVERSITY AND ENDEMISM

Taxonomic Group	Species	Endemic Species	Endemism (%)
Plants	25,000	15,000	60.0
Mammals	380	172	45.3
Birds	769	142	18.5
Reptiles	452	243	53.8
Amphibians	244	196	80.3
Freshwater Fishes	950	350	36.8

PLANTS

Sundaland is one of the biologically richest hotspots on Earth, holding about 25,000 species of vascular plants, 15,000 (60%) of which are found nowhere else. One plant family, the Scyphostegiaceae, is confined to the hotspot and is represented by a single tree species, *Scyphostegia borneensis* from Borneo. There are at least 117 endemic plant genera in the hotspot; 59 of these endemic genera are found in Borneo, 17 in Sumatra, and 41 on the Malay Peninsula.

Borneo boasts a spectacular diversity of trees. There are about 3,000 species, including more than 265 species of dipterocarps; no less than 155 of these are endemic to the island. Borneo also has more than 2,000 species of orchids. The other islands are less diverse than Borneo but still boast an impressive variety of plant life. Sumatran forests include more than 100 dipterocarp species, nearly a dozen of which are endemic, and Java has more than 270 endemic orchids.

Notable plants in the hotspot include members of the genus **Rafflesia**, represented by 16 species with very large flowers. One of these, **Rafflesia arnoldii**, has the largest flowers in the world, measuring up to one meter in diameter.

THREATS

Human Impacts

The most significant threat facing Sundaland's biodiversity is forest destruction. Most deforestation has occurred in just the last three decades, a result of commercial logging and major agricultural projects in combination with government policies and small-scale agriculture. Some of the threats to the region's forests include rubber production, pulp production, and commercial and illegal logging. In Sumatra, illegal and unsustainable logging and non-timber forest product extraction are widespread, fueled by high demand from China, North America, Europe, and Japan. The military and police are sometimes involved, as are paper industries, which obtain most of their wood from forests rather than plantations. Oil palm plantations are also an increasing threat to forests in the hotspot. Increasing prices for palm oil led the government of Jambi Province, in Sumatra, to plan for the conversion of one million hectares of forest to oil palm; similar development is planned in other parts of Sumatra. Furthermore, the infamous Indonesian Transmigration Program, which moved people from more crowded areas of the country, such as Java, to the less populated islands, has accelerated pressures on biodiversity in some places. Rapid road construction increases the extent and speed of deforestation, by providing access for loggers, settlers, and miners.

Particularly hard hit have been the more accessible lowland forests: recent estimates show that Kalimantan's protected lowland forests declined by 56% between 1985 and 2001, primarily from logging, and that less than 33% of lowland forest and peat swamp remains across all of Indonesian Borneo. At current deforestation rates, lowland forest in Sumatra and Kalimantan may soon disappear completely. Logging has been extensive in some protected areas; for example, forest loss averaged around 2% per year within Bukit Barisan Selatan National Park between 1985 and 1999, and as much as 9.5% per year in GunungPalung National Park between 1999 and 2002.

In recent years, fires have become a major threat to the forests of Sundaland. Tropical forests do not naturally burn, but logging operations create flammable conditions by leaving fuelwood on the forest floor and by exposing the understory to drying. Fires are also sometimes intentionally lit to convert forests to oil palm plantations. Because few tropical plants are adapted to periodic fires, tropical forests are very slow to regenerate after burning. Under the intense exploitation pressure in the region, these forests may never return. In 1997, 15,000 square km in Sumatra and 30,000 km in Kalimantan were lost to fire.

Today, only around 700,000 km of forest remains, much of it highly fragmented. Only about 100,000 km remains in more or less intact condition, representing approximately 7% of the original extent of the forest. Most of this remaining primary habitat is montane, and lies in the interior of Borneo and within a few protected areas in Sumatra, Peninsular Malaysia, and the southernmost portion of Thailand. Even these areas are under threat. In Sumatra, protected area management has been severely hampered due political developments in 2001: decentralization has delegated power to 78 local governmental structures, but responsibility for protected areas has remained with the central government, which has little authority or capacity for real enforcement or management.

One of the most insidious threats to the fauna of Sundaland is the wildlife trade. Orang-utan numbers were severely reduced in the past because of the pet trade. Today, tigers and

rhinoceroses are the most visible targets of hunting for the Chinese medicine market, for skins, body parts, and horns. Turtles, snakes, geckos, pangolins, bear, and monkeys are exported by the ton from the region on a daily basis. Indonesia has long been the region's leading producer and exporter of snake leather. This trade has been surpassed in recent years by the export of live turtles to East Asia. Most turtle populations throughout the Sundaland hotspot are either in decline or have collapsed. Indonesia's massive cage bird trade has also placed a number of species such as Bali Starling and Straw-headed bulbul (*Pycnonotus zeylanicus*, VU) under serious threat; the latter species, once common across its range, is now confined largely to remote areas.

4. WESTERN GHATS AND SRI LANKA



Faced with tremendous population pressure, the forests of the Western Ghats and Sri Lanka have been dramatically impacted by the demands for timber and agricultural land. Remaining forests of the Western Ghats are heavily fragmented; in Sri Lanka, only 1.5% of the original forest remains.

Population levels are also applying increased stress on the fringes of protected areas where many farms, loggers, and poachers use the resources illegally. Due in part to the varying effect of the yearly monsoons and the high mountain regions, this hotspot is home to a rich endemic assemblage of plants, reptiles, and amphibians. Sri Lanka alone may be home to as many as 140 endemic species of amphibians. The region also houses important populations of Asian Elephants, Indian Tigers, and the Endangered Lion-tailed Macaque. Freshwater fish endemism is extremely high as well, with over 140 native species.

VITAL SIGNS

Hotspot Original Extent (km ²)	189,611
Hotspot Vegetation Remaining (km ²)	43,611
Endemic Plant Species	3,049
Endemic Threatened Birds	10
Endemic Threatened Mammals	14
Endemic Threatened Amphibians	87
Extinct Species†	20
Human Population Density (people/km ²)	261
Area Protected (km ²)	26,130
Area Protected (km ²) in Categories I-IV*	21,259

†Recorded extinctions since 1500. *Categories I-IV afford higher levels of protection.

OVERVIEW

The Western Ghats of southwestern India and the highlands of southwestern Sri Lanka, separated by 400 kilometers, are strikingly similar in their geology, climate and evolutionary history. The Western Ghats, known locally as the Sahyadri Hills, are formed by the Malabar Plains and the chain of mountains running parallel to India's western coast, about 30 to 50 kilometers inland. They

cover an area of about 160,000 km² and stretch for 1,600 km from the country's southern tip to Gujarat in the north, interrupted only by the 30 km Palakkad Gap.

Sri Lanka is a continental island separated from southern India by the 20-meter-deep Palk Strait. The island, some 67,654 km² in size, has been repeatedly connected with India between successive inter-glacial, most recently until about 7,000 years ago by a land bridge up to about 140 kilometers wide.

The Western Ghats mediates the rainfall regime of peninsular India by intercepting the southwestern monsoon winds. The western slopes of the mountains experience heavy annual rainfall (with 80 % of it falling during the southwest monsoon from June to September), while the eastern slopes are drier; rainfall also decreases from south to north. Dozens of rivers originate in these mountains, including the peninsula's three major eastward-flowing rivers. Thus, they are important sources of drinking water, irrigation, and power.

The wide variation of rainfall patterns in the Western Ghats, coupled with the region's complex geography, produces a great variety of vegetation types. These include scrub forests in the low-lying rain shadow areas and the plains, deciduous and tropical rainforests up to about 1,500 m, and a unique mosaic of montane forests and rolling grasslands above 1,500 m.

Precipitation across Sri Lanka is dependent on monsoonal winds, resulting in much of the island experiencing relatively low rainfall (less than 2,000 millimeters per year), except for the southwestern "wet zone" quarter, where precipitation ranges to as much as 5,000 millimeters per year. While dry evergreen forests occupy almost the entirety of the "dry zone," dipterocarp-dominated rainforests dominate the lowlands of the wet zone, and some 220 km² of tropical montane cloud forest still persist in the central hills, which rise to a maximum altitude of 2,524 m.

SPECIES DIVERSITY AND ENDEMISM

Taxonomic Group	Species	Endemic Species	Endemism (%)
Plants	5,916	3,049	51.5
Mammals	140	18	12.9
Birds	458	35	7.6
Reptiles	267	174	65.2
Amphibians	178	130	73.0
Freshwater Fishes	191	139	72.8

PLANTS

There are a minimum of 6,000 vascular plant species in the Western Ghats and Sri Lanka hotspot, of which more than 3,000 (52%) are endemic. There are also more than 80 endemic plant genera, many of which have only one species.

The Western Ghats harbors approximately 5,000 species of vascular plants belonging to nearly 2,200 genera; about 1,700 species (34%) are endemic. There are also 58 endemic plant genera, and, while some are remarkably speciose (like **Niligrianthus**, which has 20 species), nearly three-quarters of the endemic genera have only a single species.

Some prominent genera and families are represented by large numbers of endemic species, such as Impatiens with 76 of 86 species endemic, **Dipterocarpus** with 12 of 13 species endemic, and **Calamus** with 23 of 25 species endemic. Of the 490 tree species recorded from low- and mid-elevation forests, 308 species are endemic. The only gymnosperm tree, **Podocarpus** (= **Nageia**) **wallichianus**, is also endemic. Of the 267 species of orchids, 130 are endemic.

Similarly, plant diversity and endemism in Sri Lanka are quite high, with 3,210 flowering plant species in 1,052 genera, of which 916 species and 18 genera are endemic. Amazingly, all but one of the island's more than 55 dipterocarp species is found nowhere else in the world. In addition, the island's ferns (although not recently assessed) are estimated to number about 350 species. Approximately 433 plant species, and at least five genera, are confined to Sri Lanka and the Western Ghats combined.

In the Western Ghats, the Agasthyamalai Hills in the extreme south are believed to harbor the highest levels of plant diversity and endemism at the species level. Nearly 87% of the region's flowering plants are found south of the Palakkad Gap (37% being exclusive to this sub-region); these figures decrease to about 60% and 5%, respectively, in the Nilgiri Hills. In Sri Lanka, diversity, richness, and endemism across all taxa are much higher in the wet (including the montane) zone than in the dry zone. Indeed, the wet zone, which accounts for only a quarter of Sri Lanka's territory, contains 88% of the flowering plants occurring in the island, and 95% of its angiosperm endemics.

THREATS

Human Impacts

Extremely high population pressure in both countries of this hotspot has seriously stressed the region's biodiversity. There are more than one billion people in India and almost 20 million in Sri Lanka. Nearly 50 million people occur in the hotspot overall, at a density of 260 people/km² (one of the highest in hotspots). It is likely that no more than about 25% of the extent of original native vegetation remains in relatively pristine condition today.

The forests of the Western Ghats have been selectively logged and highly fragmented throughout their entire range. Forests have been converted to agricultural land for monoculture plantations of tea, coffee, rubber, oil palm, teak, eucalyptus, and wattle, and are also cleared for building reservoirs, roads, and railways. Encroachment into protected areas further reduces the extent of forests. Grazing by cattle and goats within and near protected areas causes severe erosion on previously forested slopes. Much of the remaining forest cover consists of timber plantations or disturbed secondary growth.

Today, approximately 20% of the original forest cover remains in more or less pristine state, with forest blocks larger than 200 km² found in the Agasthyamalai Hills, Cardamom Hills, Silent Valley-New Amarambalam Forests, and southern parts of the South Kannada District in Karnataka State.

Remaining forest patches are subject to intense hunting pressure and the extraction of fuelwood and non-timber forest products. Uncontrolled tourism and forest fires are additional concerns.

The growth of populations around protected areas and other forests has led to increasing human-wildlife conflict. Raiding elephants cause crop loss, and leopards kill livestock. Compensation for farmers is generally inadequate, and wild animals are often killed or injured in an attempt to reduce further damage.

Source: Conservation International: www.conservation.org; www.cepf.net