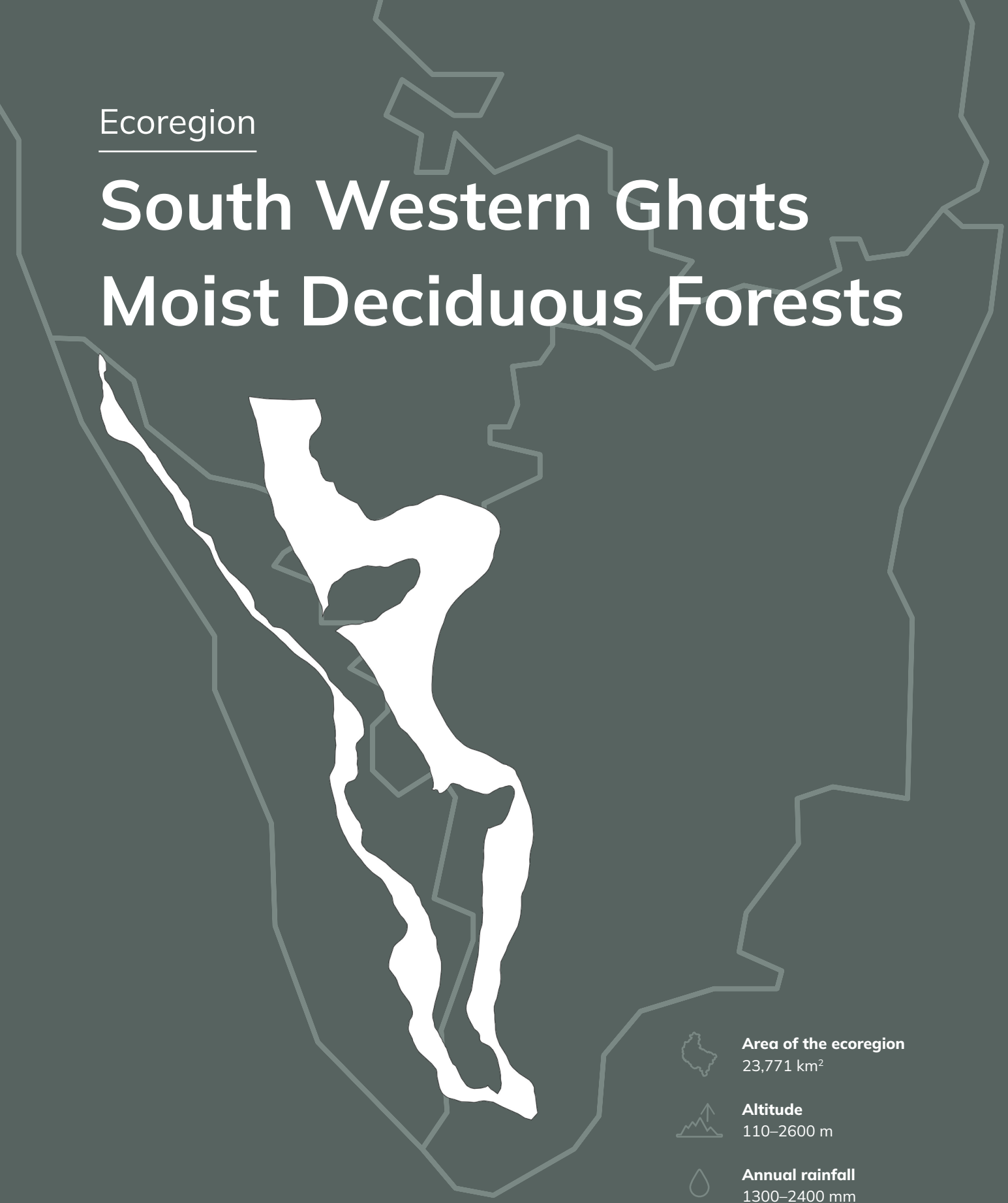
Ecoregion

South Western Ghats Moist Deciduous Forests



Area of the ecoregion
23,771 km^2

Altitude
110–2600 m

Annual rainfall
1300–2400 mm

Temperature
15°C–38°C

Ecological Restoration Alliance

Overview

South Western Ghats Moist Deciduous forests are a tall statured distinctly seasonal forest type that creates a transition from the wet rainforests regions of the plateaus and hill ranges of the southern Western Ghats and the surrounding drier plains. A large proportion of this is within protected areas and form the largest single contiguous belt of forest in south India, playing a crucial role in the survival and sustenance of large mammal species as well as for local and global seasonal migrant populations of birds and insects. The forest is a progressive transition between the typical wet evergreen and the dry deciduous forests in the Deccan Plateau.

Adjoining ecoregions

This ecoregion wraps around and almost continuously flanks the South Western Ghats Montane Rainforests. Towards the west coast this ecoregion transitions into the Malabar Coast Moist Forests while to the east the region merges with the South Deccan Dry deciduous Forests.

Moist deciduous forest structure: Mudumalai

Geography

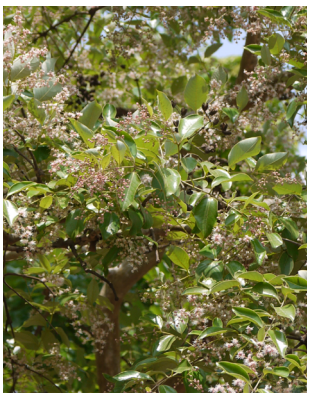
This region encompasses an area of 23,771 km². It forms a belt of forests that transition from the moisture laden plateaus, ridges and higher elevation crests and peaks of the Western Ghats down to the rain shadow regions of the Deccan and the Malabar coast. This forest type spans a length of 485 km from the Nagarhole Tiger Reserve to the Kalakad Mundanthurai Tiger Reserve. This region functions as a buffer of the southern spine of the hill ranges, whose forests are primarily situated on the slopes leading down to the plains. This region shares the same rivers as the South Western Ghats Montane rainforests from where most hydrological systems originate. Within this landscape rivers gain speed and volume as smaller streams and montane rivulets converge at this point before becoming larger and more singular drainage systems that flow out into the plains.

Geology and soil

The region consists of eroded, ferralitic soils on the slopes of hills and ghats and alluvial loam and clay in the valleys and basins of the plains. Ferralitic soils also extend out into the plains. The bedrock of the region is dominated by granitic formations, gneiss and in select locations schists. Most soil horizons are acidic in nature, and leaching plays a major role in dictating the nutrient availability. The plains around the hill ranges hold a high amount of calcium.

Climate

The region is marked by its distinct seasonality of wet and dry months. During the wet months the region receives an annual rainfall between 1300 mm and 2400 mm, with rainfall being extremely variable across multiple years. The majority of precipitation is received during the southwest monsoon during the months of June to August. The northeast monsoon plays a relatively small role within this landscape, although large depressions mark their influence. The landscape receives more from local convectional thundershowers concentrated in the months of April and May. The dry months occur between January to April, being driest in February. The summer is characterized by high temperatures rising upto 38° that lead to the strong convection currents that form the summer thundershowers. The coldest months occur between January to March with a minimum temperature of 15°. Orographic rainfall gradients dictate annual precipitation quantities and distribution in areas closer to the ghats.



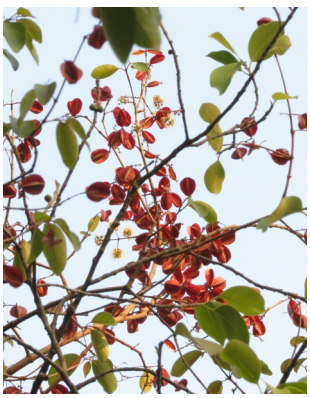

Trees–Canopy[left to right]: *Lagerstroemia microcarpa, Hopea parviflora, Schleichera oleosa, Terminalia bellirica*




Trees–Sub-canopy[left to right]: *Buchanania lanzan, Chionanthus mala-elengi, Litsea coriacea, Careya arborea*




Shrubs[left to right]: *Desmodium pulchellum, Maesa indica, Memecylon malabaricum, Solanum verbascifolium*




Lianas and Climbers[left to right]: *Combretum ovalifolium, Dioscorea pentaphylla, Smilax zeylanica, Calycopteris floribunda*

Natural vegetation

Most deciduous forests are tall and stratured with the emergent trees attaining a height of 30 - 40 m. The canopy is between 20 - 30 m tall followed by a smaller layer of sub-canopy trees. Shrubs and lianas are quite variable in density and occurrence within the forests as there are quite distinct differences based on the availability of moisture, which varies according to geographic location. The sub-canopy of the forest holds a greater proportion of evergreen species that have adapted to drier and more seasonal environments. Trees of moist deciduous forests are broadleaved and mostly hardwoods forming straight boles. The plants produce copious fruits and flowers as the dropping of leaves during the summer months helps streamline the energy budget.

Variation within ecoregion

The ecoregion has two separate belts, one flanking the western face of the southern Western Ghats and the other broader belt along the eastern face. There are significant differences in overall resource availability and prevailing weather between the two ‘arms’ of the ecoregion. The western section has a higher annual rainfall, is more aseasonal and humid. There is also less stark variation in elevation, with more gradual and undulated folding terrain. The eastern front of this landscape is drier, gets less rainfall due to the rain shadow effects as it lies on the leeward side of hill ranges. Forests on the eastern plateau regions also share more species with the Deccan

Ghat sections of sloping to the plains: Mudumalai

Characteristic native plant species

Trees

Canopy

Aporosa lindleyana
Actinodaphne malabaricum
Adina cordifolia
Albizia odoratissima
Anogeissus latifolia
Antidesma acidum
Bischofia javanica
Bombax ceiba
Bridelia airy-shawii
Casearia ovata
Cassine glauca
Diospyros sylvatica
Ficus amplissima
Ficus drupacea
Ficus racemosa
Grewia tiliifolia
Hopea parviflora
Hydnocarpus laurifolia
Lagerstroemia microcarpa
Lannea coromandelica
Mallotus tetracoccus
Polyalthia wightii
Pterocarpus marsupium
Schleichera oleosa
Semecarpus anacardium
Sterculia villosa
Syzygium gardneri
Terminalia bellirica
Terminalia crenulata
Terminalia elliptica
Terminalia paniculata
Tetrameles nudiflora
Viburnum acuminatum
Xylia xylocarpa

Sub-canopy

Buchanania lanzan
Careya arborea
Catunaregam spinosa
Chionanthus mala-elengi
Clausena dentata
Dillenia pentagyna
Glochidion ellipticum
Glochidion tomentosum
Litsea coriacea
Olea dioica
Phyllanthus emblica
Walsura pinnata
Wrightia tinctoria

Shrubs

Allophylus reedii
Bambusa bambos
Desmodium gangeticum
Desmodium pulchellum
Felicium decipiens
Helicteres isora
Maesa indica
Memecylon malabaricum
Pavetta tomentosa
Pothomorphe subpeltata
Sarcostigma kleinii
Solanum torvum
Solanum verbascifolium

Climbers

Artabotrys zeylanicus
Calamus gamblei
Calycopteris floribunda
Cissus repens
Combretum ovalifolium
Cyclea peltata
Derris brevipes
Dioscorea pentaphylla
Piper argyrophyllum
Smilax zeylanica
Spatholobus purpureus
Tylophora asmatica
Tylophora macranthus
Vigna umbellata

Plant seasonality

J	F	M	A	M	J	J	A	S	O	N	D
											
											
											

dry deciduous forests as the transition from rainforests to moist deciduous forests to dry deciduous forests is more progressive in change and less rigidly demarcated. Additionally, prevailing climate patterns become progressively more aseasonal and humid at lower latitudes. Lower latitudes also receive higher amounts of rainfall during the northeast monsoon due to the narrowing of the Indian peninsula, and the greater influence of coastlines.

Plant seasonality

This forest type shows a greater synchrony in overall seasonal phenology, with high levels of convergence in leaf production, flower production and fruiting patterns due to optimization of growth and reproductive strategies. The broad windows for these events have been represented in the table below. The main variation between individual plant species occurs due to the differing growth and maturation rates. For example, leaf initiation and maturation time periods can take between 1 - 12 weeks. Rate of flower maturation, initiation and time open has a broad range within species ranging from 10 - 60 days. Fruiting begins at the end of the southwest monsoon and takes an average of 3 months to mature with most maturation of fruits clustered around the end and beginning of the year. Leaf abscission for deciduous trees occurs between the months of December and January. Leaf production-abscission cycles and flower initiation timings show variable multi-year patterns, while fruit maturation tends to show limited variability.

Pollination and seed dispersal ecology

Most flowers are generalist in nature with multiple groups of fauna pollinating and visiting several different species. Most deciduous forest trees produce copious amounts of nectar and thus are most dominantly pollinated by birds and hymenopterans, and less often by other insect orders. Of the trees, two thirds of the fruits are dispersed by animals while most others are wind-dispersed species. Animal fruits are predominantly dispersed by birds, primates, large mammals, and bats.

Animal life

The combination of several tiger reserves in this ecoregion creates the single largest contiguous belt of forests in south India. This plays a vital role in sustaining large mammal populations and hosting an extended range for species such as the tiger, Asian elephant, sloth bear, leopard, Asiatic wild dog. Apart from these species, at least

89 other mammal species occur in the ecoregion. This ecoregion holds a high diversity of birds with at least 322 species of birds, including 9 endemic species shared with the wetter tracts. Many species show significant local and long-range migration, as wintering birds or as species that migrate away during the annual drought period. The ecoregion hosts high insect diversity including, hemipterans, coleopterans, and butterflies, especially following the monsoon.

Conservation

The majority of land within this ecoregion falls under numerous large protected areas including tiger reserves and sanctuaries, and these play an important role in the sustenance and the future of these forest types. However a large proportion of land within these protected areas have been historically converted to teak (*Tectona grandis*) plantations for timber harvest and have undergone repeated logging and management interventions. Thus many sections of forest lands do not represent the original diversity of the ecosystem and are also highly disturbed. High disturbance has also seen to result in the large-scale colonization, and spread of invasive species such as *Lantana camara* within large tracts of the forests stifling the regenerative capacity and animal movement within those areas. Disturbance, and the increase in understory congested by invasive species has made annual forest fires a major factor in altering the forest dynamics and diversity. These fires are concentrated during the dry summer months, and they reduce the average tree density, limit the shrub layer and increase grass patches and scrub forest tracts within demarcated areas.

Ecological restoration projects within the ecoregion

We are currently unaware of projects in this ecoregion, if you know of any please send a mail to hello@era-india.org, and we will get in touch with you.




Left to right: *Asian elephant, sloth bear, Bengal tiger, chameleon*

Important protected areas within the ecoregion

Nagarhole Tiger Reserve

Mudumalai Tiger Reserve

Bandipur Tiger Reserve

Anamalai Tiger Reserve

Sathyamangalam Tiger Reserve

Attapadi Reserve Forest

Nelliyampathy Forest Reserve

Periyar National Park

Neyyar Wildlife Sanctuary

Kalakad Mundanthurai Tiger Reserve

Peppera Wildlife Sanctuary

Konni Reserve Forest

Thenmala Reserve Forest

Ranni Forest Division

Idukki Wildlife Sanctuary

Sholayar Reserve Forest

Chimmony Wildlife Sanctuary

Thonnikadavu

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One Earth Ecoregion Snapshot
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