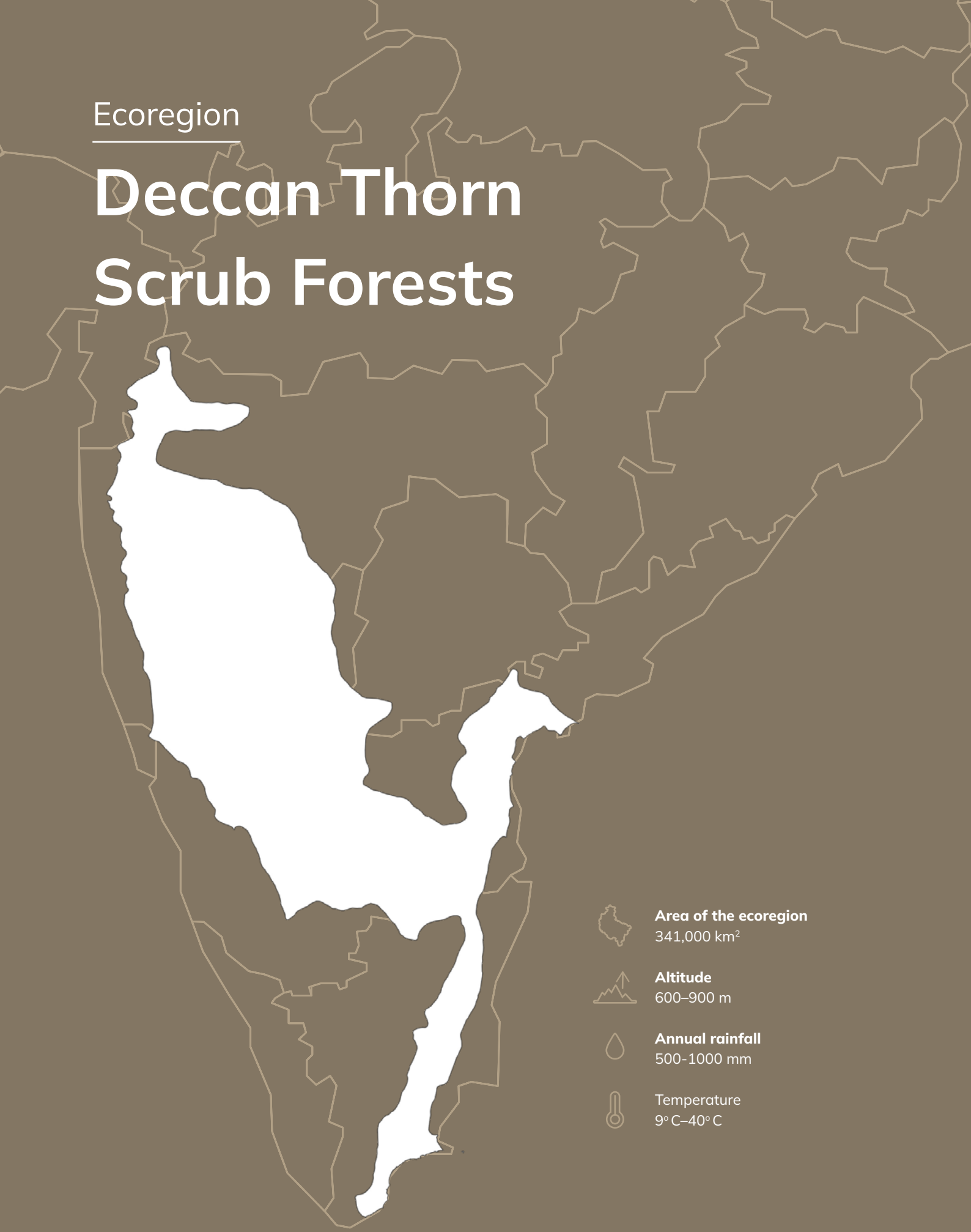
Ecoregion

Deccan Thorn Scrub Forests



Area of the ecoregion
341,000 km^2

Altitude
600–900 m

Annual rainfall
500-1000 mm

Temperature
9° C–40° C

Ecological Restoration Alliance

Overview

This large, semi-arid region, primarily situated on the Deccan Plateau, is characterised by sparsely vegetated, thorn forest or savanna like forests. The ecoregion has a complex and diverse geological history influencing the unique formations in the region. Strong edaphic factors, a low rainfall and harsh climate has resulted in a specialised diverse group of plants and animals adapted to the rocky outcrops and hill ranges and the various basins and biogeographic regions of the scrub ecosystem. This region houses the floodplains and basins of most of the major rivers of peninsular India. This area is considered one of the most ancient geological landscapes with a rich biological and cultural history.

Ecological Restoration Projects in the Ecoregion

Mine restoration in Pandalgudi

Kalpavalli Community Conservation Area

Adjoining ecoregions

This large ecoregion transitions into the East Deccan Dry Evergreen forests and the South Deccan Dry Deciduous Forests towards the southernmost regions. The ecoregion

Thorn scrub hills: Madanapalle, Andhra pradesh

is flanked by the North Western Ghats Moist Deciduous Forests and the Extension of the Narmada Valley Dry deciduous forests. Towards the north, this region transitions into the Central Deccan Plateau Dry Deciduous forests. The east coast contains tracts of the Godavari Krishna Mangroves.

Geography

This large ecoregion covers an area 341,000 km^2 which includes the majority of the deccan plateau and the northern deccan traps. With a total length of 1560 km this region extends from the Tapti river basin down to the tip of the peninsula. The southernmost reaches form a narrow leg that runs parallel to the coastal profile while the majority of the expanse is straddled in the land between the Western Ghats and the northern Eastern Ghats. The Deccan plateau; averaging from 600 to 900 m above sea level, is characterised by an undulating terrain dominated by erosive processes and extended networks of small valleys and gorges. This region is home to most of the major systems of the peninsula including: The Godavari, Indravati, Tungabadhra, Krishna and Bhima rivers. These rivers are fed by numerous tributaries and streams both originating from the hill ranges as well as from small fluvial systems that form over the contours and landforms; and provide a crucial input of water to an otherwise rain shadowed and arid region.

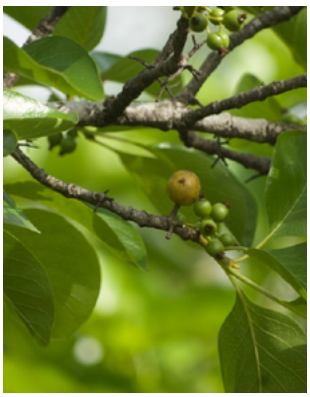
Geology and Soil

A distinct feature of the deccan plateau is the diverse layered geological mosaics of basal rock and soil types. These different formations are associated with the rich historical processes that formed the deccan plateau, and have specific geographic boundaries and reaches thus playing a dominant role in influencing the biogeography of the region and its biomes and ecosystem types. Major soil types of the region include: Nutrient rich volcanic silt and schistic soil along the northern deccan traps, ferruginous,quartzite rich soils of the central and southern regions and alluvial loam along the coast and deltas. Bedrock composition also varies from laterite formations to the west, Basalt to the north , large granitic pediplains or gneissic formations in the south and stratified laminar granite or ‘Kadapa’ to the southwest.

Climate

The uniform higher elevation of the Deccan and the heavy rain shadow effects that occur due to the blockade of clouds and depression systems from the west and east



Trees[left to right]: *Albizia amara, Chloroxylon swietenia, Commiphora caudata, Deccania pubescens,*




Trees[left to right]: *Gardenia gummifera, Givotia moluccana, Premna tomentosa, Ziziphus xylopyrus*




Shrubs[left to right]: *Benkara malabarica, Cadaba fruticosa, Carissa spinarum, Dodonaea viscosa*




Climbers[left to right]: *Walsura trifoliata, Phyllanthus polyphyllus, Naringi crenulata, Murraya paniculata*

results in low annual rainfall in this region ranging from 500-1000 mm. The southern extensions of this ecoregion receives a sizable portion of its rainfall from the =northeast monsoon as well between the months of October to December Annual dry periods

Thorn Scrub thickets structure, Andhra Pradesh

can be 6 months or more with drastic variation in rainfall and drought quite common. During the drought periods strung duty winds and gusts become a staple and common feature. Most of the rainfall occurs during the Southwest monsoon between June to September with convectional thundershowers playing an important role. Temperatures reach a maximum between the months of March and May reaching as high as 40 degrees celsius and averaging between 33 to 36 degrees. Minimum temperatures can go as low as 9 degrees during January with an average of 18 degrees celsius across the region. Maximum and minimum temperatures vary significantly according to the latitude, elevation and distance from the coast. Higher latitudes, higher elevations have lower minimum and maximum temperatures.

Natural vegetation

Due to extremes in seasonality, harsh dry periods the vegetation of this region is predominantly a dense wooded, small leaved-thick leaf and armed group of shrubs and trees that form a single layered canopy or cover that ranges from 5 - 10 m in height. The density of this forest type forms dense and interlocked hedge like growths

Characteristic native plant species

Trees

Acacia catechu
Albizia amara
Anogeissus latifolia
Buchanania axillaris
Chloroxylon swietenia
Commiphora caudata
Dalbergia lanceolaria
Deccania pubescens
Diospyros ebenum
Diospyros melanoxylon
Dolichandrone atrovirens
Ficus amplissima
Ficus mollis
Gardenia gummifera
Givotia moluccana
Hardwickia binata
Limonia acidissima
Madhuca indica
Morinda pubescens
Phyllanthus emblica
Premna tomentosa
Pterocarpus marsupium
Sterculia urens
Strebulus asper
Syzygium alternifolium
Syzygium cumini
Terminalia alata
Terminalia catappa
Vitex altissima
Wrightia tinctoria
Ziziphus xylopyrus

Shrubs

Atalantia monophylla
Bauhinia racemosa
Benkara malabarica
Boswellia serrata
Bridelia cinerascens
Cadaba fruticosa
Carissa carandas
Carrissa spinarum
Catunaregam spinosa
Cleistanthus collinus
Cycas beddomei
Dendrocalamus strictus
Dodonaea viscosa
Drypetes sepiaria
Erythroxylum monogynum
Flueggea leucopyrus
Grewia flavescens
Grewia tiliaefolia
Huberantha cerasoides
Ixora arborea
Memecylon umbellatum
Murraya paniculata
Naringi crenulata
Ochna obtusata
Phyllanthus polyphyllus
Pterolobium hexapetalum
Walsura trifoliata
Wendlandia tinctoria
Ziziphus mauritiana

Plant seasonality

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

with sections of barren rocky land and pockets of taller stature dry deciduous trees. The vegetation composition is predominantly slow growing and short trees and shrubs both sharing very similar growth strategies, physiological characteristics and adaptations for this climatic type. Although limited by climate these forest types hold a large diversity of shrub and tree species with specific distributional boundaries. At any given section of forest the dominant set of species can make up more around 50 percent of the community composition. However this set of dominant species are very variable from one geographic zone to another. There is an equal number of deciduous species as well as evergreen species that have adapted to arid climates. Most of the vegetation is low growing and extremely hardy to adverse climatic conditions.

Variation within ecoregion

As mentioned earlier, this large ecoregion, majorly influenced by geological processes and local climate, has distinct boundaries and patterns. It also holds some endemic species that have adapted to unique habitats within the landscape e.g., *Terminalia pallida*, *Pterocarpus santalinus*, *Shorea tumbuggaia*, *Syzygium alternifolium*, *Glochidion tirupathiense*.

Topography has a dominant role to play, in a peninsular level there is a gradual sloping gradient from west to east with higher peaks and flatter undulating areas found towards the west with an increased density of gaps, gorges and eroded flood-plains that lead to exposed granitic formations such as inselbergs, castle kopjes, bornhardts and tors found further east and south. There is significant variance in forest type between separate parts of the region with areas closer to the hill ranges holding a greater number of deciduous forest species as carryovers from the adjoining areas. Proximity to river channels, basins or fluvial system plays a critical role in dictating forest type, stature and densities.

Plant seasonality

The annual phenology of species broadly follows the patterns of the dry deciduous forests surrounding this region. However, in this forest type inherent seasonality is more limited and plant phenology is far more reliant on significant weather events such as first monsoonal rains or amount or frequency of pre-monsoon showers which can determine the timings of flushes and flowering. Also the seasonality of plants changes

significantly according to the levels of stress induced by possibly extended droughts or times of plenty as vegetation of this region functions in a tightly balanced energy budget.

Pollination and seed dispersal ecology

Most flowers are pollinated by insects of the small classes dominated by Hymenopterans, lepidopterans, and coleopterans. Flowers of plants adapted to harsh conditions are small and largely pollinated by several groups of insects. Some of the larger deciduous trees within the region are also pollinated by birds. A large subset of species use wind dispersal with a few trees and shrubs producing berries primarily pollinated by birds and small mammals.

Animal life

This region is home to some distinct grazing antelopes such as the chinkara, four-horned antelope and the gazelle. The rocky outcrops boulder hill slope formations provide important habitats for sloth bear and leopard populations. This landscape is one of the last tracts that is home to significant numbers of the Indian wolf and is also an important habitat for the Indian fox. Characteristic reptiles of the region include



Left to right: *Indian wolf, slender loris, saw scaled viper*



Left to right: , *Eurasian eagle owl, Blue rock thrush, great Indian bustard*

the monitor lizard, rock python, saw-scaled viper, Russell's kukri, and the common cat snake. This landscape is home to 96 species of butterflies. Insect populations are very seasonal in this ecosystem following an annual cycle. There are a significant group of more than 200 species of birds that are specialised in these rocky scrub habitats including the egyptian vulture, blue rock thrush, eurasian eagle owl, yellow-throated bulbul, Indian nightjar and the Indian courser.

Conservation

These landscapes are one of the most disturbed areas in the subcontinent affected by grazing, firewood collection, and conversion to agriculture, with fewer, small protected areas also disturbed by human interventions. Parts have also suffered from ill-advised tree planting and monoculture plantations of eucalyptus, neem, *Melia dubia* and other trees. Historic land use plays a major role in the arid landscape as greater disturbance increases the abundance and spread of more hardy, and arid thorny species that can at times replace more diverse and dense floristic compositions in soil types applicable to their growth following natural successional patterns. For this reason, there is also intrusion of scrub forest species into disturbed deciduous and dry-evergreen forest regions.

Important Protected Areas in the Ecoregion

1. Seshachalam Biosphere Reserve
2. Cumbum Forest Range
3. Sri Penusila Narasimha Wildlife Sanctuary
4. Pakkamalai Reserve Forest
5. Gengavaram Reserve Forest
6. Muttukadu Reserve Forest
7. Siruvadi Reserve Forest
8. Koothakudi Reserve Forest
9. Lankamalla Reserved Forest
10. Nagoor Reserved Forest
11. Nakkasalem Reserved Forest

Ecological Restoration Projects in the Ecoregion

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Key References

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One Earth Ecoregion Snapshot
https://www.oneearth.org/ecoregions/deccan-thorn-scrub-forests/

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www.era-india.org

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