Australian Government
Department of the Environment and Energy

NVIS Fact sheet
MVG 2 – Eucalypt tall open forests

Australia's native vegetation is a rich and fundamental element of our natural heritage. It binds and nourishes our ancient soils, shelters and sustains wildlife, protects streams, wetlands, estuaries, and coastlines; and absorbs carbon dioxide while emitting oxygen. The National Vegetation Information System (NVIS) has been developed and maintained by all Australian governments to provide a national picture that captures and explains the broad diversity of our native vegetation.

This is part of a series of fact sheets which the Australian Government developed based on NVIS Version 4.2 data to provide detailed descriptions of the major vegetation groups (MVGs) and other MVG types. The series is comprised of a fact sheet for each of the 25 MVGs to inform their use by planners and policy makers, as well as additional fact sheet which describes other MVG types (an additional eight MVGs).

For more information on this series of fact sheets, including its limitations and caveats related to its use, please see 'Introduction to the Major Vegetation Group (MVG) fact sheets'.

Overview

Typically, vegetation areas which are classified under MVG 2 – Eucalypt tall open forests:

- are equivalent to the concept of 'wet sclerophyll forest', which encompasses forests with a eucalypt-dominated overstorey and understoreys dominated by a range of species with 'mesomorphic' (non-sclerophyllous) foliage
- are made up of forests greater than 30 m tall and with projective foliage cover of between 30 and 70 per cent. Wet sclerophyll forests less than 30 m tall are included in MVG 3 – Eucalypt open forests
- are dominated by *Eucalyptus* species. These vary between tropical and temperate climatic zones and between eastern and western sides of the continent
- include the tallest tree species in Australia and the tallest flowering plant in the world, *Eucalyptus regnans* (mountain ash), found only in Tasmania and Victoria
- possess an understorey that varies widely, depending on soil types, climate and fire history
- have understorey plants that include a number of species also found in rainforest
- can be prone to extensive canopy fires, especially at temperate latitudes. Fires liberate resources and create open space that is essential for recruitment and establishment of eucalypt seedlings.

(Banner photo) Cool temperate wet sclerophyll forests, Dandenong Ranges, Vic (Photo: M. Fagg)

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Facts and figures

Major Vegetation Group	MVG 2 - Eucalypt tall open forests
Major Vegetation Subgroups (number of NVIS descriptions)	3. Eucalyptus (+/- tall) open forest with a dense broad-leaved and/or tree-fern understorey (wet sclerophyll) 54. Eucalyptus tall open forest with a fine-leaved shrubby understorey 60. Eucalyptus tall open forests and open forests with ferns, herbs, sedges, rushes or wet tussock grasses
Typical NVIS structural formations	Open forest (tall, mid) Tall Woodland
Number of IBRA regions	27
Most extensive in IBRA region (Est. pre-1750 and present)	NSW North Coast (NSW)
Estimated pre-1750 extent (km^2)	45 291
Present extent (km^2)	37 148
Area protected (km^2)	13 808

Structure and physiognomy

- Tall open tree canopy that allows a luxuriant understorey of soft-leaved shrubs, ferns and herbs to develop. Trees typically have long unbranched boles.
- At least three structural layers:
  - the tree canopy dominated by eucalypts with 30 to 70 per cent projective foliage cover and more than 30 m tall
  - a shrub layer of variable density and height
  - a ground layer comprising herbs, ferns and graminoids.

  In many cases there can be four structural layers with tall shrubs and small trees of non-eucalypt species below the upper tree canopy.
- Vines and creepers are often a feature of tall open eucalyptus forests, especially in subtropical and warm temperate regions.
- Ferns, both as part of the ground layer or as tree ferns in the shrub or small tree layer, are also a common feature.
- Patches of rainforest are often embedded within a matrix of tall open forest, the two blend together as intermediate forms in which small rainforest trees form a sub-canopy beneath the eucalypts.
- Depending on time since last fire, these forests typically have a deep layer of leaf litter and branches shed continually by the dominant eucalypts.

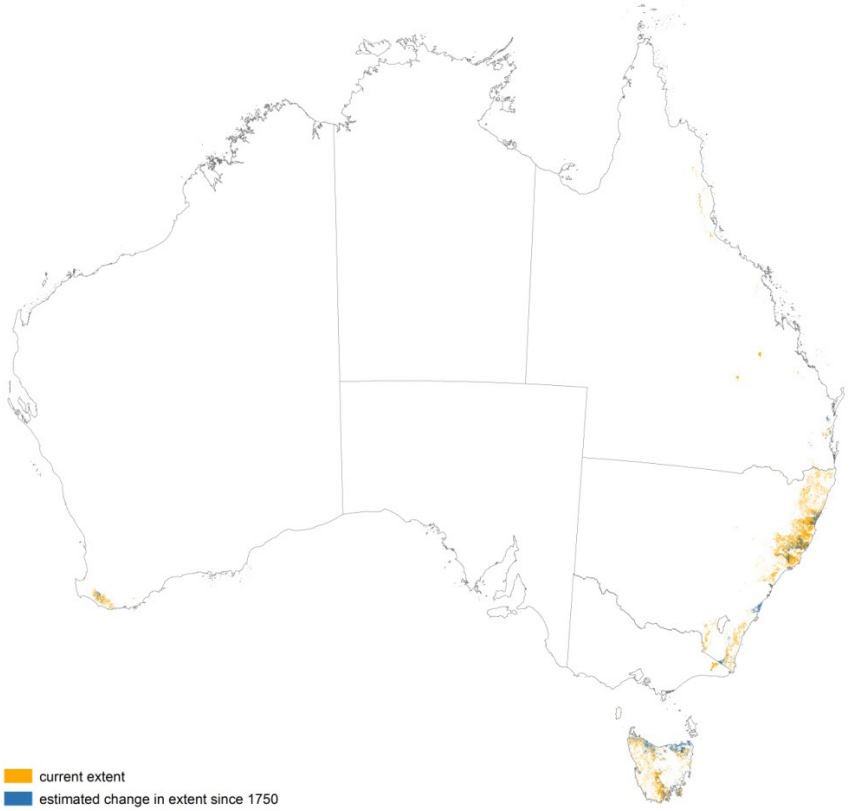
Wet sclerophyll forests (*Eucalyptus diversicolor – karri*) of Western Australia (Photo: D. Shepherd)

Indicative flora

- The species composition of this major vegetation group varies along latitudinal and altitudinal gradients in eastern Australia, while the Western Australian forests share few species with those in the east. These and more subtle distinctions related to soil moisture and substrates, separate subgroups.
- Many of the eucalypts that distinguish the tall open forests belong to sections *Transversaria* or *Maidenaria* within the subgenus *Symphyomyrtus*. Most others belong to the 'green ash' and 'peppermint' subseries within subgenus *Eucalyptus* (formerly *Monocalyptus*). At local scales, two eucalypts from the same section rarely co-occur, but species turnover along local gradients can be substantial, especially in northern NSW, where large numbers of eucalypt species occur within this MVG.
- Typical species include:
  - *Eucalyptus delegatensis* subsp. *delegatensis* (alpine ash), *E. obliqua* (messmate stringybark) and *E. viminalis* subsp. v*iminalis* (manna gum) in Tasmania, Victoria, Australian Capital Territory and New South Wales
  - *E. pilularis* (blackbutt), *E. saligna* (Sydney blue gum), *E. grandis* (flooded gum), *E. microcorys* (tallowwood), *E. laevopinea* (silver-top stringybark), *Syncarpia glomulifera* (turpentine) and *Lophostemon confertus* (brush box) in New South Wales and Queensland
  - *E. cypellocarpa* (mountain grey gum), *E. fastigata* (brown barrell) and *E. radiata* (narrow-leafed peppermint) in Victoria and New South Wales
  - *E. acmenoides* (white mahogany), *E. muelleriana* (yellow stringybark), *E. elata* (river peppermint), *E. smithii* (gully gum) and *E. deanei* in New South Wales
  - *E. diversicolor* (karri) and *E. marginata* (jarrah) only found in Western Australia
  - *E. diversicolor* (karri) in association with *E. jacksonii* (red tingle), *E. guilfoylei* (yellow tingle), *E. brevistylis* (Rate's tingle) and *Corymbia calophylla* (marri) in Western Australia.
- *Acacia* species are often conspicuous species in the subcanopy. Other shrubs and small trees include species of *Asteraceae, Lauraceae, Myrtaceae, Pittosporaceae* and *Rhamnaceae*. Conspicuous fern taxa include *Cyathea, Dicksonia*, *Blechnaceae* and *Dryopteridaceae*.

Environment

- Distribution of this major vegetation group is controlled primarily by high, reliable rainfall and dominates regions receiving between 1500 and 2000 mm per year with at least 50 mm in the driest season. As mean annual rainfall declines below 1500 mm, tall open eucalyptus forests are increasingly confined to topographically sheltered situations.
- The tall forests of Western Australia occur in a marginal climate where mean annual rainfall is between 1000 and 1400 mm per year with the driest month having a mean of greater than 15 mm.
- Tall open eucalypt forests grow on moderately fertile soils often with clay and silt particles dominating the texture.
- These forests produce enormous quantities of leaf litter which accumulates on the forest floor.
- The cool temperate wet sclerophyll forests experience some of the most intense wildfires on earth. These typically recur on century time scales coinciding with prolonged periods of extreme hot dry weather and strong winds. At subtropical latitudes, fire weather is less severe and fires may only scorch the tree canopy.



The image above outlines the location of this MVG group in Australia.

Geography

- This major vegetation group occurs in high rainfall areas from south-east Queensland, south to Tasmania with outliers in north-eastern Queensland and south-western Australia.
- Tall eucalypt forests have a relatively narrow ecological range comprising only four per cent of the 147 million ha of forest in Australia.
- Its largest area is in New South Wales which is estimated to be larger than 24 000 km^2.

Change

- Approximately 18 per cent of the estimated pre-1750 extent of this major vegetation group has been cleared, accounting for less than one per cent of total vegetation clearing in Australia.
- Clearing has been primarily for forestry, agriculture and dams.
- The early management of Australian forests was primarily based on timber production. Extensive areas of accessible forest are now in a range of regrowth states following timber extraction. More recently, governments have sought to manage forest areas sustainably for a wider set of values, including biodiversity, water catchment and recreation.
- Many tall open forests have the capacity to re-establish after clearing (in a simplified state) and provide multiple values for the community (e.g. regrowth karri forest around Pemberton cleared over 100 years ago and now regrowing).
- Tall open eucalypt forests are potentially vulnerable to changes in climate patterns through increased temperature, decreased rainfall and the effect of the increased occurrence of extreme weather on fire regimes.
- While risks posed by clearing and unsustainable logging are declining, weed invasion is an ongoing legacy of earlier disturbances and fires continues to be a major management issue.
- Emerging threats include forest diseases and pest outbreaks such as brown rot in wet sclerophyll forests in Western Australia, myrtle rust disease and bell miner related dieback in eastern and south-eastern Australia.
- Fire management remains problematic, partly because suitable conditions for prescribed fires are extremely limited between prevailing conditions that are too wet to support fire propagation and extreme conditions in which fires cannot be safely controlled.

Key values

- Biodiversity that includes rich and varied plant communities unlike any others in the world.
- Highly-diverse bird communities.
- Water catchments.
- Geodiversity derived from their presence across a range of locations and site conditions.
- Remnant populations of a wide range of vertebrate and invertebrate fauna species.
- Timber production.
- Major carbon sinks.
- Ecotourism, including bushwalks, wilderness experiences and tree-top walks (e.g. Nornalup, Western Australia and Tahune in southern Tasmania).
- The public have placed a high value on the cultural and heritage values associated with the stature of the larger and taller trees in these communities (e.g. Bird Tree in Camden Haven, Gloucester and Diamond Tree lookouts near Pemberton and Manjimup).

List of key management issues

- Adoption of evidence-based approaches on new harvesting practices applicable to the ecology of forests being managed.
- Management of hollow-bearing trees and associated populations of cavity-dependent animals.
- Fragmentation, edge effects, isolation and faunal barriers caused by clearing and infrastructure such as roads/powerlines.
- Tourist/visitor management.
- Fire regimes and ignitions in surrounding landscapes. Fire is used as a tool in some areas for regenerating forests, while in other areas the intensity and frequency of fire is critical to the persistence of forest flora and fauna. In cool temperate forests, most of the dominant tree species are killed by canopy fires and rely on seed for regeneration. Frequent canopy fires may lead to long-lasting elimination of trees and transformation of eucalypt forests to acacia forests.
- Disease and pest management.
- Legacies of weed infestations from past clearing and logging, aggressive vines, lantana, privets.
- Long-term monitoring to inform future management strategies.

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Data sources

Interim Biogeographic Regionalisation for Australia (IBRA), Version 7.

National Vegetation Information System, Version 4.2.

Collaborative Australian Protected Areas Database – CAPAD 2014 – Terrestrial.

Notes

- Increases in present extent arises largely from improved NVIS 4.2 data in New South Wales.

Wet sclerophyll forest of the subtropics, northern NSW (Photo: D. Keith)