Australian Government
Department of the Environment and Energy

NVIS Fact sheet
MVG 3 – Eucalypt open forest

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. An additional eight MVGs are available outlining other MVG types.

For more information on these 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 classified under MVG 3 – Eucalypt open forest:

- correspond well with 'dry sclerophyll forests', but may include some wet sclerophyll forests (mostly classified within MVG 2) that do not exceed 30 m in height
- are distributed widely in monsoonal, tropical, subtropical and temperate latitudes on soils of low to moderate fertility
- dominant trees vary from 10 to 30 m tall and with crown cover 50 – 80 per cent (foliage projective cover of 30 – 70 per cent) depending on soil characteristics, local moisture and rainfall
- are dominated by a variety of eucalypts from the genera *Corymbia, Angophora* and *Eucalyptus* subgenus *Eucalyptus,* occasionally with *Eucalyptus* species from other subgenera, notably *Symphyomyrtus*
- comprise understoreys typically dominated by shrubs, but may have a variable grass component, depending on soil characteristics
- are periodically fire-prone
- form the bulk of Australia's forested country and are a primary resource for the timber industry.

(Banner Photo) Dry sclerophyll forest with a shrub/grass understorey near Awaba (Newcastle area), NSW (Photo: M. Fagg)

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Facts and figures

Major Vegetation Group	MVG 3 - Eucalypt open forests
Major Vegetation Subgroups (number of NVIS descriptions)	4. Eucalyptus open forests with a shrubby understorey 5. Eucalyptus open forests with a grassy understorey 60. Eucalyptus tall open forests and open forests with ferns, herbs, sedges, rushes or wet tussock grasses
Typical NVIS structural formations	Open forest (mid)
Number of IBRA regions	56
Most extensive in IBRA region (Est. pre-1750 and present)	South Eastern Highlands (NSW, Vic)
Estimated pre-1750 extent (km^2)	339 872
Present extent (km^2)	234 254
Area protected (km^2)	68 956

Riparian eucalypt open forest (*Eucalyptus camaldulensis*), Narrabri, NSW (Photo: D. Keith)

Structure and physiognomy

- In comparison to Eucalypt tall open forests (MVG 2), open eucalypt forests allow more light to penetrate the canopy providing scope for development of less shade-tolerant understoreys.
- Generally, the tree canopy varies from 10 to 30 m tall and has a crown cover 50 – 80 per cent (foliage projective cover of 30 – 70 per cent) depending on soil characteristics, local moisture and rainfall.
- Leaf canopies are evergreen, typically with vertically oriented notophyll (20 - 45 cm^2) leaves.
- Sclerophyllous understoreys dominated by shrubs with varying grass component, depending on soil texture, moisture and fire history.
- Substantial structural variation in both tree and understorey components of open forests occurs at local scales.

Indicative flora

- This MVG exhibits high levels of species turnover in dominant species regionally, and with local environmental gradients. Dominance by *Corymbia, Angophora* or *Eucalyptus* subgenus *Eucalyptus* is a uniting feature. Other subgenera within *Eucalyptus* may be present (e.g. *Symphyomyrtus*), but rarely dominate or occur without co-occurring trees of these three main taxa.
- Shrub genera common to both east and west Australian forms of MVG 3 include species of *Acacia, Allocasuarina, Banksia, Daviesia, Grevillea, Hakea, Hibbertia, Leptospermum, Pultenaea, Xanthorrhoea* and *Xanthosia*. Common herbaceous genera include *Dianella, Lepidosperma* and *Lomandra* and the ferns *Adiantum* and *Pteridium*.
- Forest understoreys are similarly variable, but typically contain some genera from Fabaceae, Myrtaceae, Proteaceae and Asteraceae and have a variable ground layer.
- Northern eucalypt open forests are dominated by *Eucalyptus tetrodonta* (Darwin stringybark), *E. miniata* (Darwin woollybutt) and *E. nesophila* (Melville Island bloodwood). The woody understorey and associated species differ through the presence of *Terminalia, Buchanania, Livistona* (palms) and cycads. In some areas, northern forests support an understorey dominated by grasses such as species of *Triodia, Plectrachne and Sorghum*.
- Southern eucalypt open forests are often dominated by either sclerophyllous shrubs or grasses such as *Stipa* and *Danthonia* (or *Austrostipa* and *Austrodanthonia* respectively, depending on their taxonomic acceptance). However, they also include the world renowned *E. marginata* (jarrah) forests in the south-west of Western Australia. These occur as pure stands and in association with *E. wandoo* (wandoo) and *Corymbia colophylla* (marri). In south-eastern Australia, a diverse suite of eucalypt species are found, but some species may be widespread:
  - *E. baxteri* (brown stringybark) and *E. obliqua* (messmate stringybark) in South Australia and Victoria;
  - *E. macrorhyncha* (red stringybark), and *E. sideroxylon* (red ironbark), *E. sieberi* (silvertop ash), *E. radiata* (narrow-leaved peppermint) and *E. dives* (broad-leaved peppermint) in Victoria and New South Wales;
  - *E. crebra* (narrow-leaved red ironbark), *Angophora* spp. and *Corymbia gummifera* (red bloodwood), *C. maculata* (spotted gum) and *E. acmenoides* (white mahogany in New South Wales and Queensland);
  - *C. citriodora* (lemon-scented bloodwood) and *C. intermedia* (pink bloodwood) in Queensland;
  - *E. camaldulensis* (river red gum) as an open forest is dominant along water courses in South Australia, inland New South Wales and Victoria;
  - *E. microtheca* (coolabah) and *E. ochrophloia* (yapunyah) occurs along watercourses and seasonally inundated flats in the north-east of New South Wales; and
  - Dominant species in Tasmania include: *E. globulus, E. viminalis, E. obliqua, E. delegatensis, E. pauciflora, E. tenuiramis, E. pulchella, E. ovata, E. amygdalina* and *E. nitida*.

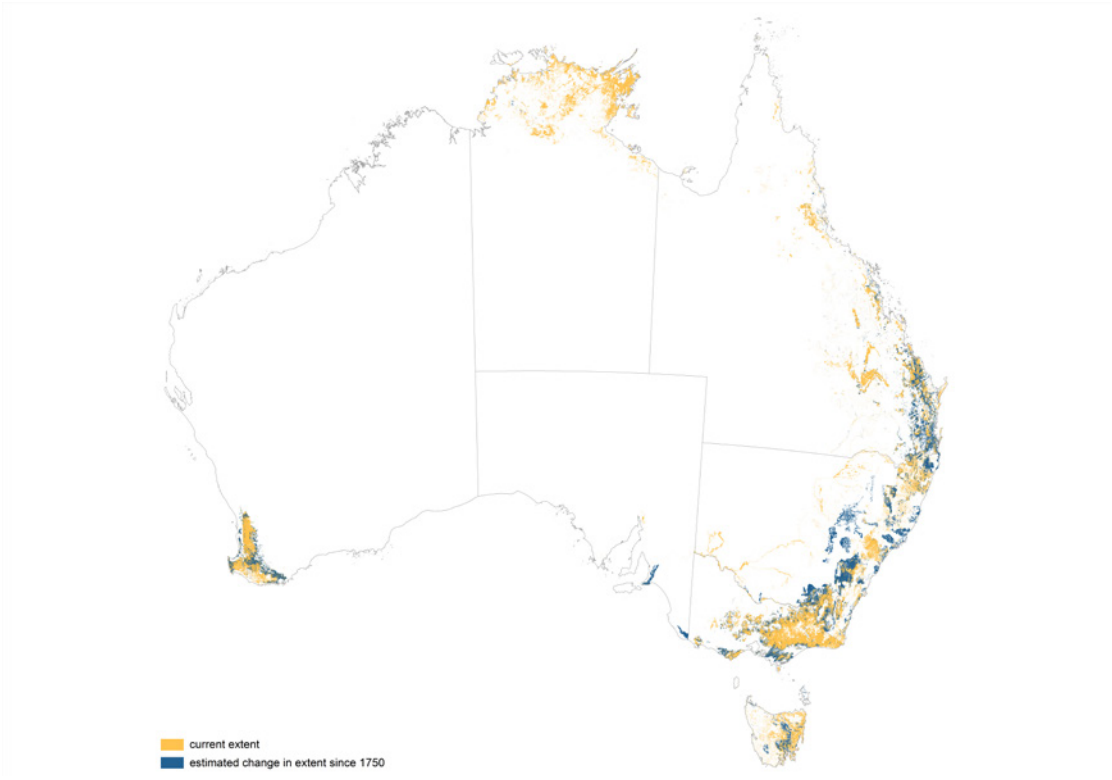
Environment

- Low soil fertility, and soil phosphorus in particular, is crucial in determining the distribution of dry sclerophyll forests.
- The forest terrain in much of south-eastern Australia is rugged but in the south-west the terrain is relatively subdued.
- Eucalypt open forests (dry sclerophyll) with a shrubby understorey occur across a broad range of environments from coastal sand plains, hills and plateaus of sandstone dolerite and granites. Soils can be deep sands to shallow, infertile soils derived from sedimentary or granitic substrates with a high concentration of quartz. Rainfall ranges from 500 to 2000 mm annually. In south-western Western Australia, these occur on lateritic soils, granites and leached sands in areas receiving more than 700 mm mean annual rainfall.
- Eucalypt open forests (dry sclerophyll) with shrub/grass understoreys occur on well drained loams and sandy loams of moderate fertility on undulating lowlands, foothills and gorges, and the western slopes of the Great Dividing Range. Substrates include mudstones, dolerite, lithic sandstones, lateritic duricrusts, acid volcanics and metamorphosed siltstones. Rainfall ranges from 500 to 1200 mm annually.
- Eucalypt open forests with ferns, herb, sedges, rushes or wet tussock grasses, particularly of riparian zones, usually occur on alluvial sands and silts along major rivers and in the beds of intermittent streams and billabongs as well as fringing drainage lines on alluvial. Frequency of flooding and rate of post-flood drying profoundly influences the species composition of these forests. Eucalypt open forests (wet sclerophyll <30 m tall) are associated with high, reliable rainfall averaging 1500 mm and 2000 mm per year with at least 50 mm in the driest season.

Geography

- Usually occur in monsoonal, tropical, subtropical and temperate regions of Australia and within 200 km of the coast or along major water courses.
- Occur around the edges of Australia from the Northern Territory, Queensland, through New South Wales, Victoria and Tasmania, to southern areas of South Australia and Western Australia. There are small outliers in northern Queensland and along rivers in central and western New South Wales
- Largest areas occur in New South Wales and the Northern Territory (>50 000 km^2), Victoria (>49 000 km^2) and Queensland (>45 000 km^2). Largest major vegetation group in Tasmania, Victoria and the Australian Capital Territory.

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



Change

- Approximately 31 per cent of the estimated pre-1750 extent cleared accounting for 10 per cent of total clearing in Australia.
- Approximately 105 000 km^2 cleared since European settlement including large areas in south-east Queensland. Only 13 per cent remains of the small estimated pre-1750 distribution in South Australia.
- Dry sclerophyll forests occur on low-nutrient soils which makes them unsuitable for most forms of agriculture, and as a consequence they have been less cleared and modified than many other vegetation formations.
- Dry sclerophyll forests are relatively resilient to weed invasion, also due to low soil fertility.
- Some of the more productive forests were cleared in the latter half of the nineteenth century for timber production, both for export (e.g. jarrah) and local markets (e.g. blackbutt).
- Change in the subtropical and temperate open eucalypt forests can result from direct or indirect effects of forest management (e.g. shifts in structure and floristics resulting from timber harvesting regimes and regeneration strategies) and the effects of pests and diseases (e.g. the plant root pathogen *Phytophthora cinnamomi* in the *Eucalyptus marginata* forests in Western Australia and the *Eucalyptus baxteri/ Eucalyptus obliqua* forests in Victoria).
- Changing fire regimes, especially during the mid-nineteenth to mid-twentieth century, have influenced the composition and structure of dry sclerophyll forests.

Key values

- Biodiversity including many endemic and rare flora and fauna species.
- Geodiversity of landforms and substrates.
- Remnant populations of a wide range of vertebrate and invertebrate fauna species.
- Timber (e.g. hardwoods for framing and flooring).
- Ecotourism (e.g. bushwalking, wildflower viewing) in remnant and wilderness forests in all states.

List of key management issues

- Clearing/edge effects.
- Wildlife corridor re-establishment between remnants.
- Isolation and faunal barriers caused by roads/powerlines.
- Tourist/visitor management.
- Fire regimes (protection of life and property versus management of biological values).
- Disease prevention and management, especially *Phytophthora cinnamomi* in southern regions.
- Feral animal control.
- Forest management for multiple values.
- Long-term monitoring to inform future management strategies.

Open dry shrubby sclerophyll forests (*Eucalyptus marginata - jarrah*), south-west WA (Photo: M. Bolton)

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Open shrubby dry sclerophyll forests near Tumbarumba, NSW (Photo: B. Pellow)

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

- This fact sheet should be read in conjunction with MVG 2: Eucalypt tall open forests and MVG 5: Eucalypt woodlands.