



# NVIS Fact sheet

## MVG 6 – Acacia forests and woodlands

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 6 – Acacia forests and woodlands:

- are almost all dominated by a single *Acacia* species, which co-occurs with other members of the genus only in transitional segments of environmental gradients and other genera may occur as subdominants
- its species composition and the identity of the dominant species vary along rainfall gradients, with substrate and to a lesser extent rainfall seasonality
- comprises several typical Acacia communities including: "brigalow" and "gidgee", which dominate forests or woodlands that are restricted to subtropical and nearby tropical eastern Australia on productive clay soils in sub-humid climates; and "mulga" and "lancewood", which dominate woodlands on stony landscapes around the eastern fringe of the arid zone and across the north-east semi-arid landscapes adjoining savanna
- its mulga vegetation takes on a variety of structural expressions and is consequently classified partly within MVG 6, in accordance with the Kyoto Protocol definition of forest cover in Australia (trees >two m tall and crown cover >20 per cent, foliage projective cover >10 per cent); and partly within MVG 13 where the tree canopy layer is sparser, or MVG 16 where the woody dominants are not predominantly single-stemmed
- its *Acacia*-dominated vegetation in southern, central and Western Australia can take on structural expressions of open woodland and shrubland, and may be assigned to MVGs 13 and 16
- Temperate humid *Acacia* forests tend to be part of dynamic mosaics within eucalypt forest landscapes, often have emergent eucalypts within them and share virtually all of their species with surrounding eucalypt forests. In this national scale classification, they are grouped with MVGs 2 and 3.

(Banner Photo) *Acacia aneura* woodland near Yenloora, Qld (Photo: M. Fagg)

## Facts and figures

<b>Major Vegetation Group</b>	MVG 6 - Acacia forests and woodlands
<b>Major Vegetation Subgroups</b>	13. Brigalow ( <i>Acacia harpophylla</i> ) forests and woodlands 14. Other Acacia forests and woodlands 20. Mulga ( <i>Acacia aneura</i> ) woodlands +/- tussock grasslands +/- forbs 51. Mulga ( <i>Acacia aneura</i> ) woodlands and shrublands with hummock grass
<b>Typical NVIS structural formations</b>	Open forest (low, mid) Woodland (low, mid)
<b>Number of IBRA regions</b>	70
<b>Most extensive in IBRA region</b> (Est. pre-1750 and present)	Murchison (WA)
<b>Estimated pre-1750 extent (km<sup>2</sup>)</b>	465 012
<b>Present extent (km<sup>2</sup>)</b>	341 567
<b>Area protected (km<sup>2</sup>)</b>	56 444



*Acacia harpophylla* (brigalow) forest, 60km east of Tambo, Qld (Photo: M. Fagg)



## Structure and physiognomy

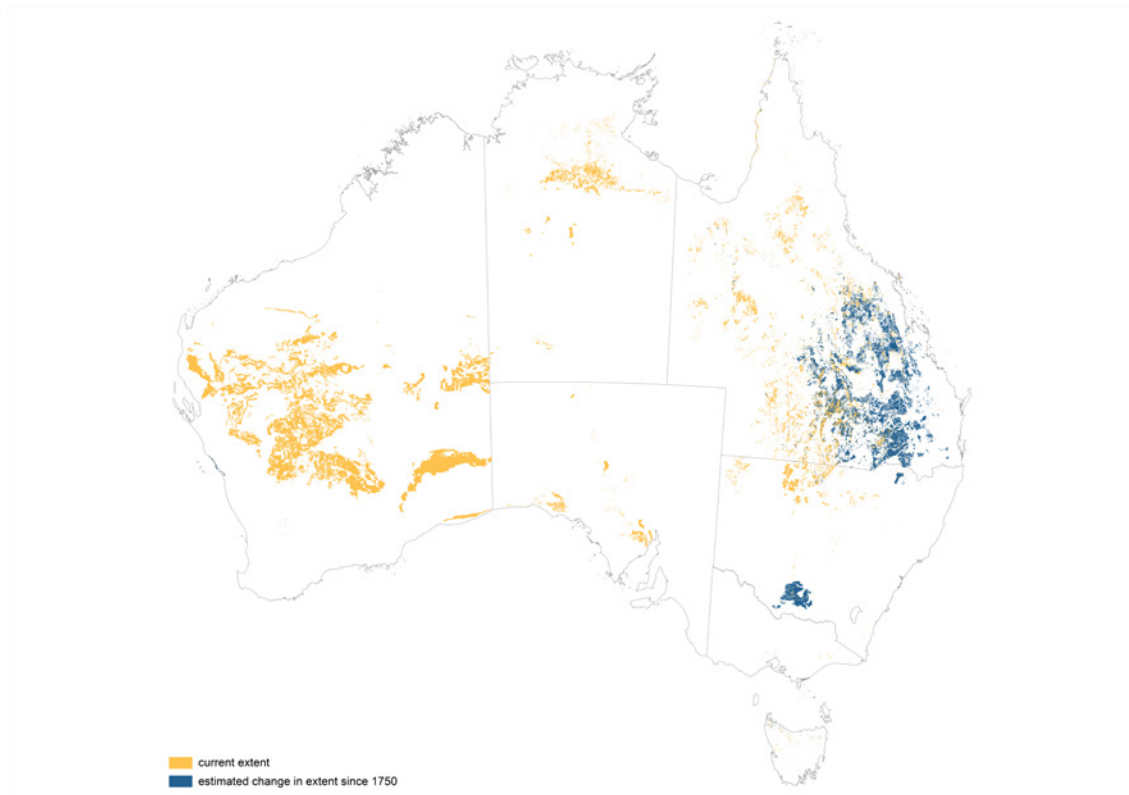
- Structure varies from open forest usually 10 - 25 m tall with canopy cover exceeding 30 per cent to woodland five m – 20 m tall with canopy cover 10 – 30 per cent along the regional rainfall gradient and with local soil moisture gradients between rises and depressions.
- Canopy emergents, where present, are primarily members of the box group of eucalypts (*Eucalyptus* section *Adnataria*), with bloodwood eucalypts (genus *Corymbia*) more common in the tropics.
- In areas where the vegetation is regrowing from recent clearing or fire, Acacias may form dense thickets, which thin gradually over time. This is especially the case for Brigalow forests and woodlands, which regenerate from sucker stems that emerge from underground rhizomes.
- Leaves of the dominant layer vary from notophyll phyllodes or leaves (20 – 45 cm<sup>2</sup>) to nanophyll phyllodinous or cladodinous needles (0.25 – 2.5 cm<sup>2</sup>), with the latter predominating in drier areas.
- Understoreys may include open layers of shrubs with typically sparse ground layers of tussock or hummock grasses and forbs that vary depending on canopy cover, rainfall and substrate.

## Indicative flora

- A single species of *Acacia* typically dominates, which co-occurs with other members of the genus only in transitional segments of environmental gradients.
- Dominant species include lancewood (*Acacia shirleyi*), bendee (*A. catenulata*), mulga (*A. aneura*), gidgee (*A. cambagei*), brigalow (*A. harpophylla*), western myall (*A. papyrocarpa*) and blackwood (*A. melanoxylon*). The most widespread species are mulga and brigalow.
- Dominance is controlled by climatic conditions and soil factors.
- Occasional emergents include *Eucalyptus*, *Casuarina* and various 'vine scrub' genera.
- Associated understorey species include shrub species such as *Eremophila*, *Dodonaea*, chenopods such as *Atriplex*, *Maireana*, *Sclerolaena* and grasses such as *Aristida*, *Austrostipa* and *Triodia*.

## Environment

- Occurs largely within the 500 - 900 mm annual rainfall belt with a predominance of summer rainfall, although winter rainfall peaks occur in the south of its distribution where the climate in western areas is more arid, and annual rainfall may exceed 1000 mm in the north where there is a strong winter drought.
- Brigalow and Gidgee assemblages occur on fine textured alkaline clays and clay loams. The clay soils often have a micro relief pattern, referred to as gilgai or melon holes, resulting from lateral mass movement associated with wetting and drying, with the depressions sometimes intermittently filling with water.
- Mulga and upland Acacia assemblages are associated with coarsely textured acid loams and sandy loams.
- Landforms also vary with Brigalow assemblages associated with rolling downs, outwash slopes and depositional areas, while Lancewood assemblages are associated with residual uplands, associated slopes and stony peneplains. About 10 per cent of remnants are associated with river and creek flats. The remainder are associated with old loamy and sandy plains, basalt plains and hills, or hills and lowlands on metamorphic or granitic rocks.



## Geography

- Occurs in an arc from northern plains of New South Wales through central Queensland, with patchy occurrence extending from central northern Queensland into the Northern Territory and Western Australia. Grows west of the Great Dividing Range on the edge of subtropical and semi-arid zone of New South Wales and Queensland.
- The bounds of the arc are determined by rainfall patterns moderated by the influence of soil texture and local topography on available soil moisture. The inner boundary of the arc aligns roughly with the 400 – 500 mm annual rainfall isohyets, beyond which MVG 6 is replaced by MVG 13. The outer boundary of the arc is loosely defined by the 900 – 1000 mm rainfall range, beyond which MVG 6 is replaced by assemblages associated with the rainforest, woodland and savannah MVGs.
- Largest area is in Western Australia (224 466 km<sup>2</sup>).

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

## Change

- Approximately 27 per cent (>123 000 km<sup>2</sup>) of the estimated pre-1750 extent cleared accounting for 11.8 per cent of total clearing in Australia.
- Much of the clearing took place in the post-war era when new machinery made possible the broad-scale clearing of suckering Acacias on clay plains.
- Foremost threats are changes in fire regime and over-grazing (including cattle, sheep and feral animals).
- Overgrazing by cattle and feral vertebrates has degraded extensive areas of Gidgee and Mulga woodlands, resulting in a lack of regeneration, soil compaction and erosion, reduction of woody debris, as well as disruption of grove-intergrove patterns critical to water movement, resource capture and landscape function.
- Mining in the Bowen Basin in Queensland and logging for fence posts in the Brigalow Belt South, Nandewar and Darling Riverine Plains bioregions of New South Wales continues to threaten significant areas of the Brigalow ecological community.
- The low density of herbage in most types of Brigalow vegetation suggests that fire has been historically rare in the Brigalow ecological community. It becomes a serious threat to remnant Brigalow where fuel characteristics have been changed (e.g. by the presence of high biomass introduced pasture grass species such as *Cenchrus ciliaris* (Buffel Grass), *Chloris gayana* (Rhodes Grass) or *Panicum maximum* (Green Panic Grass) in, or adjacent to, Brigalow woodlands.

## Key values

- Biodiversity (endangered ecological communities and species).
- Maintenance of landscape function and soil productivity.
- Remnant populations of a wide range of vertebrate and invertebrate species.
- Pastoral production.
- Ecotourism (including bushwalking and landscapes in remote areas).

## List of key management issues

- Ongoing clearing of remnant vegetation in Queensland and New South Wales.
- Grazing pressure from both domestic stock and feral animals. Trampling and grazing by large herbivores has a number of impacts. Trampling compresses soil, can reduce the amount of leaf litter and woody debris, and alters the composition and density of herbs and shrubs in the understorey of the Brigalow ecological community.
- Interactions between stocking rates and drought cycles, implementing pastoral management systems that avoid cumulative legacies of soil degradation caused by sustained overgrazing into successive drought episodes.
- Location and access to artificial watering points, which are associated with intensification of herbivore activity and associated impacts.
- Control of introduced grasses on pastoral lands to limit their influence on fire regimes and native groundcover.
- Fire regimes, recognising that some introduced grasses such as *Cenchrus ciliaris* (buffel grass) burn with greater intensity than native pasture grasses, thereby altering regeneration responses of trees and shrubs.
- Indirect effects of climate change, through increasing temperatures and lower and more erratic rainfall, on the extent and frequency of unplanned, high-intensity fires.
- Feral animals. Feral pigs are probably the most widespread and problematic pest animal, although goats, cane toads, cats and foxes are also serious threats.
- 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

- The area protected has increased by 20 000 km<sup>2</sup> in the last 10 years, reflecting improved reservation in the arid and semi-arid zones.
- This fact sheet should be read in conjunction with MVG 13: Acacia open woodlands.

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