Australian Government
Bureau of Rural Sciences

Australian forest profiles

Acacia

The genus *Acacia* occurs naturally on all continents except Europe and Antarctica and contains more than 1 500 species. Australia has around 955 species, making it the nation's largest genus of flowering plants. The genus is remarkably varied in appearance, habit and location, encompassing species with small creeping forms and trees that can grow as tall as 30 metres. Australia has more than 50 species of forest-forming acacias.[1]

Acacias became known as wattles in Australia because their branches were used to build huts with what the early British settlers called the 'wattle and daub' method. This involved weaving acacia branches among stakes to create a frame that could be plastered with mud.

Many acacias produce spectacular golden flowers and are a conspicuous feature of the Australian landscape. An acacia was one of the first Australian plants collected by Europeans.

Covering 10.4 million hectares and accounting for 7% of the total native forest area, acacia forests are Australia's second most common forest type. They predominantly form woodlands (Table 1) in regions where average annual rainfall is less than 750 millimetres. In wetter areas, however, some forests are dominated by a single acacia species. In Tasmania, for example, blackwood (*Acacia melanoxylon*) dominates extensive stands of swamp forest on poorly drained sites.

Wattle and daub hut with bark roof, Hill End, New South Wales, 1870–75.

Gidgee (*Acacia cambagei*) woodland, Central Queensland.

Where are Australia's acacia forests?

Acacia forests occur in all Australian states and the Northern Territory (Figure 1), with the largest areas in Queensland and Western Australia. They are especially common and conspicuous in arid, semi-arid and dry sub-tropical areas, where they usually occur as low woodlands. Mulga (*Acacia aneura*) is the dominant species in many parts of the arid and semi-arid zones, and also occurs as an understorey species in some eucalypt forests in eastern Australia. Brigalow (*A. harpophylla*) is widespread in Queensland and northern New South Wales, forming dense forests on flat or undulating country with clay soils.

Patches of lancewood (*Acacia shirleyi*) grow as forest on rocky outcrops and steep slopes in the tropics and sub-tropics, whereas myall (*A. pendula*) dominates forests in semi-arid country adjacent to streams or saltbush shrublands. Gidgee (*A. cambagei*) is widespread in areas where average annual rainfall is less than 500 millimetres and is even found in the Simpson Desert in central Australia.

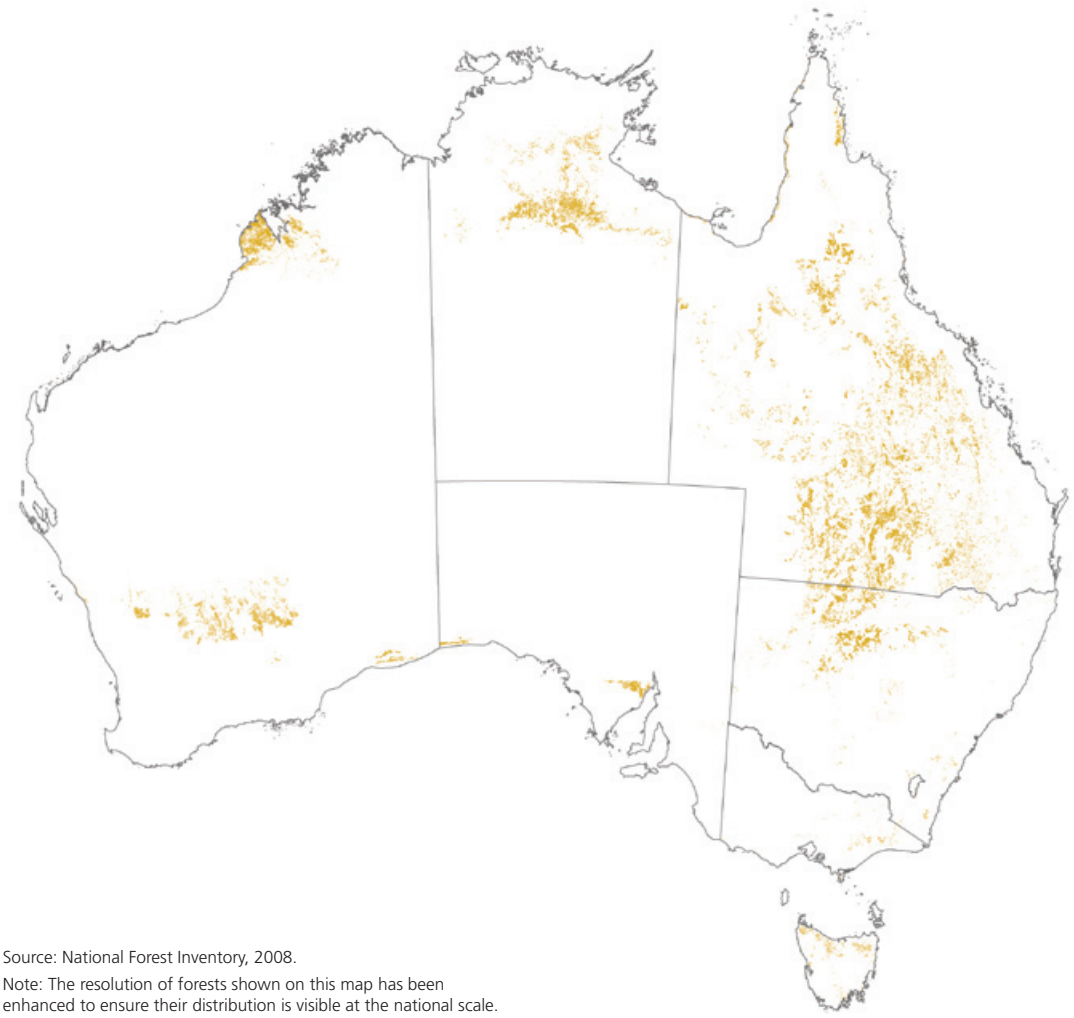
Australia's floral emblem

Golden wattle (*Acacia pycnantha*) is Australia's national floral emblem and is part of Australia's coat of arms. National Wattle Day is celebrated on 1 September each year.

Golden wattle (*Acacia pycnantha*).

1 Australia's definition of forest is 'an area dominated by trees having usually a single stem and a mature or potentially mature height exceeding 2 m and with existing or potential crown cover of overstorey strata about equal to or greater than 20%.'

Figure 1: Acacia forest distribution, 2008



Source: National Forest Inventory, 2008.

Note: The resolution of forests shown on this map has been enhanced to ensure their distribution is visible at the national scale.

Trees without leaves

Acacias produce leaves of great variety. Often, however, what look like leaves are actually phyllodes – flattened leaf stalks – that function like leaves. Some phyllodes are large – up to 30 centimetres long; others are so small they are hard to see. Some stems, such as those of *Acacia glaucoptera*, have distinctive wide wings with tiny phyllodes. Several acacias have bipinnate (fern-like) leaves, made up of a large number of small leaflets (pinnules) along a central stalk.

Left: Large (20 cm long) phyllodes of mangium (*Acacia mangium*),

Above: Bi-pinnate leaves of black wattle (*Acacia mearnsii*).

Table 1: Area of acacia forest and total native forest, by crown cover (hectares)

	Woodland	Open	Closed	Total
Acacia	7 059 000	3 306 000	0	10 365 000
Total native forest	99 007 000	44 120 000	4 270 000	147 397 000

Note: Crown cover is the area of ground covered by tree canopies, ignoring overlaps and gaps within individual canopies. It is usually measured from above using aerial photographs or other remote sensing imagery. In Australia, woodland has a crown cover of 20–50%, open forest a crown cover of 50–80%, and closed forest a crown cover of greater than 80%.

Source: NFI (2003), MIG (2008).

Table 2: Tenure of acacia forest, by state and territory ('000 hectares)

	NSW	NT	Qld	SA	Tas.	Vic.	WA	Australia
Leasehold land	1 143	1 255	4 206	159	0	0	570	7 334
Multiple-use public forests	6	0	44	0	36	13	6	105
Nature conservation reserves	54	1	271	73	14	25	55	492
Other Crown land	29	13	109	3	1	0	478	634
Private land	99	227	1,219	3	21	3	15	1 586
Unresolved tenure	1	0	212	1	0	0	0	214
Total	1 333	1 496	6 060	239	72	41	1 123	10 365

Note: Totals may not tally due to rounding. The six forest tenure categories above are defined in MIG (2008, pp xvii–xviii).
Source: MIG (2008).

Ownership and management

Less than 5% of acacia forests are in nature conservation reserves. Most (86%) occur on leasehold or private land (Table 2).

Values and uses

Wood

The arts and craft industry makes substantial use of the attractive timbers of some *Acacia* species, particularly blackwood. In the past, black wattle (*Acacia mearnsii*), silver wattle (*A. dealbata*) and brown salwood (*A. celsa*) have been harvested for their timber or to produce paper pulp.

Vases turned from lancewood (*Acacia shirleyi*). Made by Hartley Tobin, Wonthaggi Woodcrafters Inc.

Acacias have also been harvested and used for poles, posts and rails and for small-scale wood-turning. Some, such as lancewood, burn slowly and evenly and are valued as firewood.

Plantations of Australian acacias have been established in more than 70 countries. Mangium (*A. mangium*) occurs naturally in Queensland, Papua New Guinea and eastern Indonesia and is a major plantation species in tropical countries as well as in the Northern Territory. Queensland's natural populations of this species therefore constitute a valuable genetic resource for the global plantation industry.

Mangium comprises 97% of Australia's acacia plantations. The remaining plantings in Australia comprise a few hundred hectares of *A. decurrens* and *A. melanoxylon* and even smaller areas of 15 other species.

Environmental

Because of their wide distribution, acacia forests are important for biodiversity conservation and the maintenance of ecosystem processes. The Brigalow Belt in northern New South Wales and Queensland, for example, supports at least 148 species of reptiles, 13 of which are rare or endangered, and 328 species of birds, 24 of which are threatened. Mature brigalow constitutes the sole food source of the vulnerable northern imperial hairstreak butterfly (*Jalmenus evagoras* subspecies *eubulus*), which is restricted to about 30 locations in the Brigalow.

Mangium plantations on Melville Island

With a land area of 5 788 km², Melville Island is Australia's second largest island after Tasmania and the larger of the two Tiwi Islands north of Darwin. The entire island is Aboriginal freehold land. Until recently, it remained mostly untouched by large-scale modern development, the exception being a small area of trial plantations and a somewhat larger area of exotic *Pinus caribaea* (about 2 200 hectares), which was planted in the period 1975–1997. Relatively high rainfall (ranging from 1 400 mm/yr in the east to 2 000 mm/yr in the northwest), warm to hot temperatures (16–29° in July to 25–35°C in November), gentle terrain, low elevation (<102 m above sea level) and deep red and yellow sandy soils have attracted the establishment of short-rotation plantation forestry using *Acacia mangium*. First established in the late 1990s, these plantations have now expanded to more than 20 000 hectares.

Source: Davidson *et al.* (2007).


Mangium plantations on Melville Island.

Brigalow (*Acacia harpophylla*) woodland near Cecil Plains, Queensland.

Indigenous uses

Indigenous people have long used acacias for fuel, medicine, musical instruments (such as clap-sticks), tools and weapons (notably boomerangs and spearheads), and in ritual practices. The seeds of about 50 Australian dry-zone *Acacia* species are a traditional food. Acacia seeds were ground into flour to make cakes. Witchetty grubs, an important source of food, can be found under the bark and in the roots of some species. Indigenous knowledge of acacias is an invaluable guide to their potential wider use.

Other uses

Acacia forests supply industries based on cut flowers and oils and are also commonly used in land rehabilitation. Mulga is an important fodder tree across semi-arid northern Australia, sustaining stock in times of drought. Species such as black wattle were once used in Australia as a source of tannin for treating leather and are still used for this purpose overseas. Acacia seeds have been developed as a bush food used to flavour cakes, biscuits and ice cream.

Nitrogen fixation

Acacias fix atmospheric nitrogen with the aid of symbiotic bacteria (rhizobia) that live in nodules on the roots. While this process occurs in nature, a wattle seed inoculant, Wattle Grow™, has been developed to improve survival of planted acacias and reduce the amount of seed required to vegetate a given area. Containing four elite strains of *Bradyrhizobium*, it is effective on a range of wattle species used for revegetation in southeastern Australia.

References and further reading

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Websites

www.flora.sa.gov.au/id_tool.html

www.daff.gov.au/forestsaustralia

This is one in a series of profiles on Australia's major forest types. It has been compiled by the Bureau of Rural Sciences using information from the Australia's State of the Forests Report series. The latest in this series, *Australia's State of the Forests Report 2008*, and the profiles, can be obtained from:

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