

VEGETATION COMMUNITIES

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The natural vegetation of Australia is highly diverse, with many endemic genera and species. These cumulatively reflect the size of the continent, the wide range in past and present climate, and the effect of isolation, both of the continent as a whole since the break-up of Gondwanaland, and of specific regions by long-term climatic barriers. Nevertheless, despite the diversity, the native Australian flora is dominated by a few key genera, namely two large tree and shrub groups, *Eucalyptus* and *Acacia*, each of which has several hundred species, and the hummock grasses (*Triodia* and *Plectrachne* spp.). The information in this section is largely from the Australian Native Vegetation Assessment, 2001.

The overall variation is largely a product of regional climatic differences, modified by local factors including micro-climate, bedrock and regolith geology, landform and soil type. Also, there has been considerable anthropogenic impact. Although the natural vegetation had been modified by thousands of years of Aboriginal land use, principally by fire, rapid and significant changes have occurred since European settlement in the late eighteenth century. The principal changes and

impacts are: -

- Broadacre clearing for cultivation and grazing in more humid areas (~>400 mm rainfall pa), with replacement of deep-rooted trees and shrubs with shallow-rooted crops and pastures;
- Forest modification by logging, including replacement by introduced species;
- Grazing by cattle and sheep of rangelands of the semi-arid interior (and humid uplands in SE Australia) modifying and reducing the overall vegetative cover. The effects are exacerbated by the introduction of feral animals and weeds;
- Grazing by feral animals (goats, camels, donkeys, pigs) and the introduction of weeds in regions not managed as rangelands;
- Clearing for urban development and transport infrastructure, including filling of wetlands.

TABLE 1 - PRINCIPAL VEGETATION GROUPS IN AUSTRALIA

Vegetation group	Description	Pre-European area km ²	Land area %	Present area km ²	Land area %	Remaining%
Eucalypt woodlands	Widespread in transition between forests and woodlands of humid areas and hummock grasslands and shrublands of arid interior.	1,012,047	13.2	693,449	9.0	69
Eucalypt open woodlands	Originally abundant in SW and SE, now widely cleared; still extensive in semi-arid NSW, QLD and NT.	513,943	6.7	384,310	5.0	75
Mallee woodlands and shrublands	Multi-stemmed trees, mainly <6 m, in winter rainfall belt of the semi-arid south. Commonly cleared or grazed.	383,399	5.0	250,420	3.3	65
Eucalypt open forests	Trees 10-30 m; sub-coastal plains and ranges of E and SW WA.	340,968	4.4	240,484	3.1	71
Tropical eucalypt woodland/grasslands	Savannas of Kimberley, northern NT and Cape York.	256,434	3.3	254,228	<3.3	99
Eucalypt tall open forests	Trees 30-100 m.; humid northeast QLD to TAS; southwest WA.	44,817	0.6	30,129	0.4	67
Rainforest and vine thickets	Dense closed tropical to cool temperate rainforest in E. Australia.	43,493	0.6	30,231	0.4	70
Eucalypt low open forests	Trees 5-10 m; on steep slopes, sub-alpine sites, dry NW NSW.	15,066	0.2	12,922	<0.2	86
Acacia shrublands	Arid and semi-arid plains from W coast to central QLD and NSW.	670,737	8.7	654,279	8.5	98
Acacia forests and woodlands	Trees mostly <10 m. Extensive rangelands in arid central WA; more scattered and locally cleared in plains across QLD.	657,582	8.6	560,649	7.3	85
Acacia open woodlands	Mainly on undulating plains of the arid centre and E in QLD, NT, SA.	117,993	1.5	114,755	<1.5	97
Callitris forests and woodlands	Native pine, mainly central NSW, locally in QLD, VIC and arid SA.	30,963	0.4	27,724	<0.4	90
Casuarina forests and woodlands	Along SE, E and N coasts; riverbank sites, especially in west NSW.	73,356	1.0	60,848	0.8	83
Melaleuca forests and woodlands	Extensive NT and Cape York by Gulf of Carpentaria. In swamps and along wet watercourses in S.	93,501	1.2	90,513	<1.2	97
Low closed forests and shrublands	Stunted (5-10 m), dense foliage; most commonly coastal.	15,864	0.2	8,749	0.1	55
Other forests and woodlands	Diverse communities, individually restricted but locally abundant.	125,328	1.6	119,384	<1.6	95
Other shrublands	Diverse, mixed species communities; widely distributed.	115,824	1.5	98,947	1.3	85
Hummock grasslands	Evergreen perennial mounds to 1 m. Largest group in WA, wide-spread across NT, SA, QLD. Grows in poor soil, extreme climates.	1,756,962	22.9	1,756,104	22.9	100
Tussock grasslands	Tufted grasslands, mainly in the N and E.	589,212	7.7	528,998	6.9	90
Other grasslands	Herb lands, sedge lands and rush lands – common in NSW, TAS.	100,504	1.3	98,523	<1.3	98
Heath	Stunted shrubs (mainly <1 m) on sandy soil – e.g., central W coast.	47,158	0.6	25,861	0.3	55
Chenopod and samphire shrubs; forb lands	Common in extreme saline sites in semi-arid WA, SA; also QLD, NSW.	563,389	7.3	552,394	7.2	98
Miscellaneous wetlands	Mangroves, tidal mudflats, samphires and bare areas, claypans, sand, rock, salt lakes, lagoons, lakes.	112,063	1.5	106,999	1.4	96
Cleared/modified native vegetation	Agricultural, grazing and urban lands.	-	-	982051	12.8	-

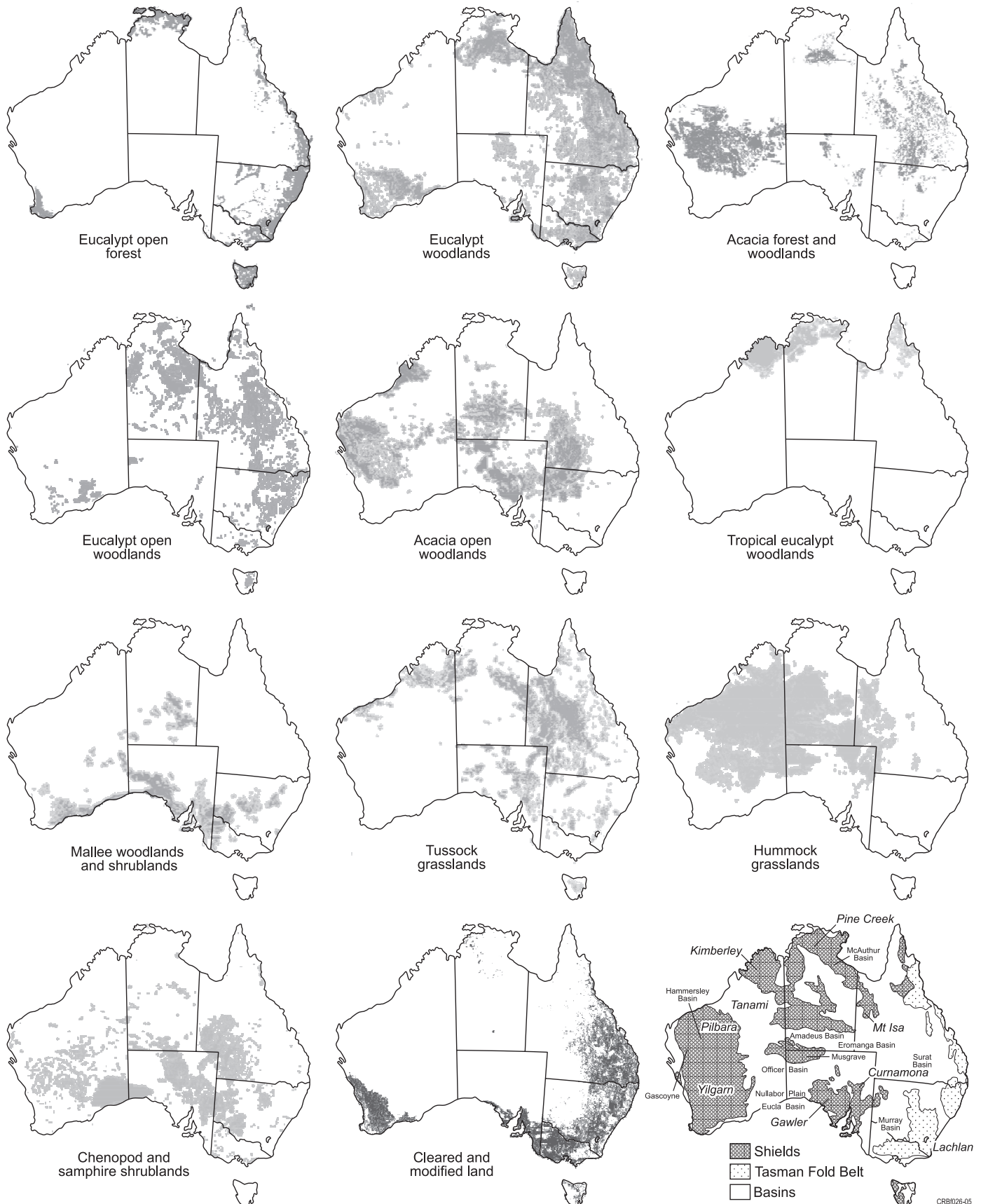


Figure 1. Some of the principal vegetation groups in Australia (derived from the Australian Native Vegetation Assessment, 2001) and the major geological components of the Australian continent.

Modification, especially by clearing, has been greatest in the SW and SE of the continent, including Tasmania, along and inland from the E coast, and some small areas in the Northern Territory. In these areas, the native vegetation commonly survives as isolated trees, linear strips (e.g., along roads), and remnant patches, including reserves and land with poor agricultural potential. Most of the remainder, mainly in the arid interior, has also been affected, mostly by grazing, either by pastoral operations in rangelands or by feral animals elsewhere.

There are more than 3000 vegetation types, summarized into twenty three major vegetation groups (Table 1) recognized as occurring prior to European settlement. Vegetation *types* are communities that have a floristically uniform structure and composition, commonly described by the dominant species; vegetation *groups* include types that have different mixes of plant species within the canopy, shrub or ground layers, but which are structurally similar and are commonly dominated by a single genus. The distributions of ten of the groups, compared with that of the main regions of cleared and severely modified land are

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illustrated in Figure 1. In summary: -

- *Forests and woodlands* covered approximately 50% of the continent across tropical northern Australia, and the higher rainfall areas of the eastern seaboard, Tasmania, the southern part of South Australia and southern Western Australia. They occur across the southern half of the Yilgarn Craton, part of the southern Gawler Craton and extensively over Palaeozoic rocks of the Lachlan Fold Belt from Tasmania to Queensland. Tropical eucalypt woodlands and grasslands form the savannas developed on Proterozoic rocks in the N and NW (e.g., Pine Creek Inlier, McArthur and Kimberley Basins). Eucalypt woodlands (trees 10-30 m high), the largest group, alone occupied about 13% of Australia, forming a transitional zone between the higher rainfall forested margins, hummock grasslands and shrublands of the arid interior. Together with open eucalypt woodlands, which have a dominant understorey, and the mallee (multi-stemmed) eucalypt woodlands (trees <6 m high), both in more arid regions, these woodlands have been the most extensively cleared for cereal cropping and grazing. The understoreys vary from grasses to shrubs. In areas of pastoral grazing, the woodlands have become open parkland.
- *Acacia woodlands*, which occupied 8.6% of the continent, consist of open forests and woodlands, mostly with stunted trees (<10 m) and an understorey of low shrubs and ephemeral herbaceous species. These woodlands occur principally across central WA, including the central and northern Yilgarn Craton, Gascoyne Province and adjacent Proterozoic basins, extending E to the Phanerozoic Officer Basin, commonly adjacent to tracts of hummock grass, which, in places, form the understorey. These are mostly uncleared, although modified by grazing and fire. In contrast, similar woodlands widespread across the young Phanerozoic basins of Queensland and northern NSW have been extensively cleared for grazing and agriculture.
- *Shrublands* covered approximately 11% of the continent, and consist dominantly of multi-stemmed *Acacia* shrubs, mostly <4 m high, of variable density. The understorey comprises low shrubs and ephemeral herbaceous species, depending on the density of the overstorey canopy. The distribution partly overlaps that of the *Acacia* woodlands, but is more widespread, occurring in more arid terrain, including undulating plains on the Gawler Craton and Proterozoic rocks in Central Australia. The shrublands have been affected by grazing and fire, but are mostly uncleared.
- *Hummock grassland* is the largest vegetation group and covers 23% of the continent, mainly in areas of semi-arid to arid western and central Australia characterized by extreme temperatures. The grasslands are dominated by evergreen perennials (*Triodia* and *Plectrachne* spp.), commonly called spinifex grass, that form round hummocks or mounds up to 1 m high. These are generally the principal overstorey species of the grasslands, although sparse *Eucalyptus* or *Acacia* emergents may occur. The ground between

hummocks is generally bare, with ephemeral herbs present after rain. Hummock grasses are also the understorey of open acacia and eucalypt woodlands. Hummock grasslands are abundant over rocky hills, (e.g., Pilbara Craton, Hamersley Basin, Musgrave Block, Mt. Isa Inlier) and sandy deserts, including dunefields, (e.g., Paterson Province, Granites-Tanami Inlier, Amadeus Basin). They also occur in sandplains on the northern Yilgarn Craton, mainly on uplands on deeply weathered granitic rocks. Clearing has been minimal, but they are susceptible to change by excessive fire.

- *Tussock grasslands*, other grasslands and communities dominated by herbaceous plants occupy about 9% of the continent. Tussock grass communities include a wide range of grasses with a tufted habit that occur dominantly in savanna to semi-arid regions, extending to some temperate areas of SE Australia. They occur in a range of landscapes from tableland and montane communities to floodplains and localised clay pans, being particularly abundant in the clay-rich soils of the flat terrain of the Phanerozoic Basins in central west Queensland, NT and SA. They typically form open treeless downlands that include some valuable pastoral lands (e.g., the Mitchell Grasslands (*Astrelba* spp.) of western Queensland, and the NT) which, although not cleared, are under pressure from intense grazing and fire. Other grass communities are abundant in a SSW-NNE belt across temperate inland NSW, over part of the Surat Basin, western Lachlan Fold Belt and upper Murray Basin.
- *Chenopod (saltbush) and samphire shrublands* include a range of hardy, low (<2 m), drought- and salt-tolerant species such as *Atriplex* (salt bush), *Maireana* (blue bushes, cotton bush). They are widespread in near-estuarine environments and in extensive flats in arid and semi-arid areas. Samphires dominate in highly saline areas in and around playas, salt scalds and near the coast. These shrublands occupy about 8% of the terrain, mainly in the southern half of the continent, especially along low-lying and saline valley floors in the Yilgarn Craton, on the Nullarbor Plain (Eucla Basin), the channel country of SW Queensland and L. Eyre lowlands (Eromanga Basin), and the Curnamona Province. There has been some over-grazing but little clearing in inland areas; indeed, the extent of these shrublands is expanding locally due to salinization.

Bare soil and extensive rock outcrop is uncommon, even in the semi-arid and arid regions of central Australia. Unvegetated plains occur in some arid regions of central Australia and their extent has increased due to grazing. Surface water, including intermittently filled playas, occupy less than 2% of the continent.

REFERENCE

Australian Native Vegetation Assessment, 2001. Australian National Resources Atlas. National Land and Water Resources Audit. Land & Water Australia, Canberra. <http://audit.ea.gov.au/ANRA/>