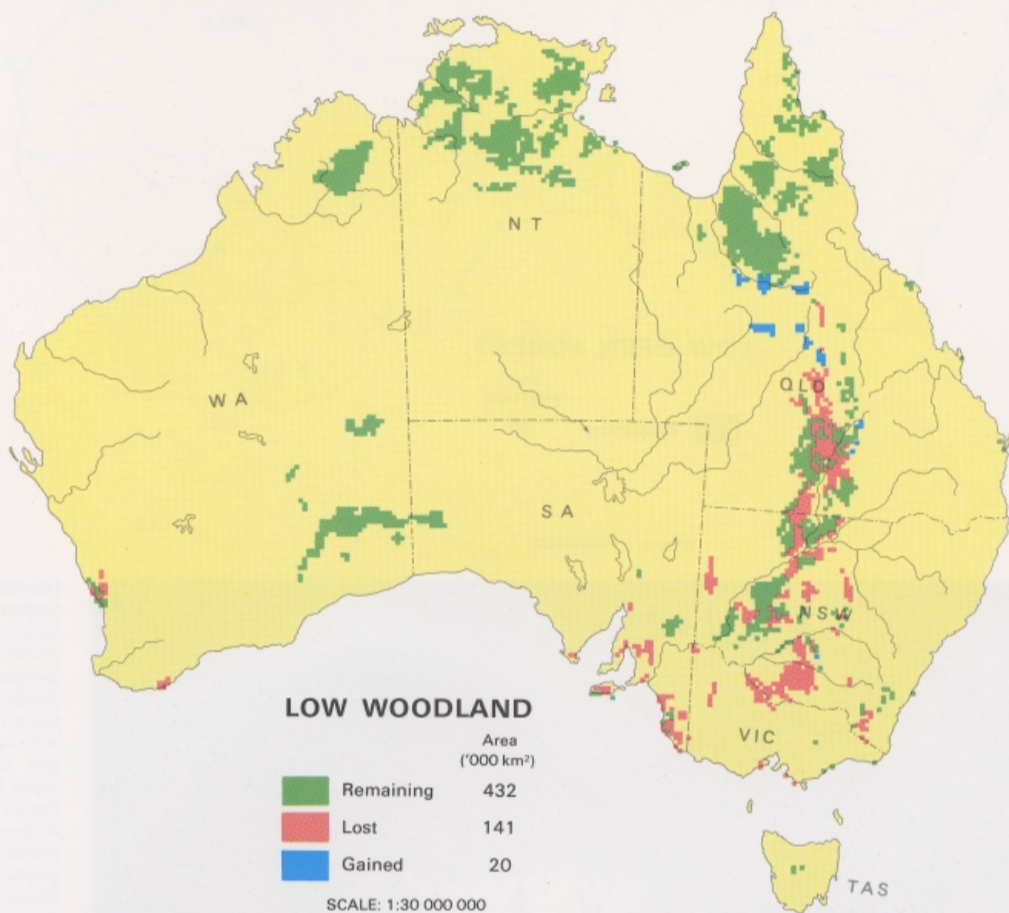


Low woodland

Trees <10 m high; 10–30% foliage cover

L2

As indicated by the variety of dominant genera shown on the maps, low woodlands are floristically very diverse. They occur extensively within the sub-humid and semi-arid zones of the continent. There are large areas of grassy low woodlands—notably those across the Top End of the NT with a range of *Eucalyptus* species and other low trees, and those south and east of the Gulf of Carpentaria in Qld with *Melaleuca* and other genera dominant. Besides the grassy low woodlands, there are numerous examples with shrubby or other understoreys.



Gidgee low woodland over tall shrubs
Gidgee (*Acacia cambagei*) is found in western Qld and NSW and in the NT, where it occurs in grassy or shrubby low woodlands. This example, in central Qld, has been disturbed by grazing but shows a common shrubby understorey of *Eremophila mitchellii*, commonly known as budda or false sandalwood.



Low woodland with tall shrubs

L2S

This subform includes some isolated and distinctive vegetation types. Over much of Kangaroo Island (SA), for example, the natural vegetation ranged between low open forest and tall shrubland, with certain *Eucalyptus* species occurring in both. It is generalised on both maps as *Eucalyptus* low woodland (**eL2S**) with *E. baxteri* dominant, over a dense lower stratum of tall shrubs including *Banksia* species. More than half of the former area has now been cleared and sown to exotic pastures (**yff3**).

Some of the low woodlands of *Acacia cambagei* in central Qld

have an understorey of tall shrubs including *Eremophila mitchellii* (**wL2S**). On the riverine plain east of Hay (NSW) a large area was formerly covered by *Acacia pendula* low woodland with an understorey of *Atriplex nummularia* (**wL2S**). This has been replaced by native pasture (**yG2**) (Moore 1953).

Various coastal or hilly areas in eastern Australia are covered by low woodlands dominated by combinations of *Eucalyptus*, *Callitris*, *Acacia*, *Casuarina* or other genera, with understoreys consisting of a very wide range of species of tall shrubs (e.g. **epL2S**, **weL2S**).

Low woodland with low shrubs

L2Z

Some of these low woodlands occur on poor sandy soils in coastal or near coastal locations in eastern Australia and in south-western WA. The major genera are *Eucalyptus* and *Banksia* (**eL2Z**, **bl2Z**, **ebL2Z**) sometimes with *Casuarina* (**ecL2Z**). Many of the *Eucalyptus* species also occur in neighbouring forests or woodlands.

The prominent species of *Banksia* include *B. serrata* in the south-east and *B. attenuata* in the south-west. The diverse low shrub stratum includes members of the families Proteaceae and Myrtaceae, which typically have small and sclerophyllous leaves. Species of *Xanthorrhoea* are often present and on wetter soils there may be a prominent ground layer of graminoids (Cyperaceae and Restionaceae).

Large areas in southern Australia have been cleared and sown to exotic pastures with some seasonal cropping, or used for the establishment of coniferous plantations.

Some areas of inland hill country in NSW carry low woodlands dominated by *Callitris glaucophylla* or *C. endlicheri* and species of *Eucalyptus*, with a varied low shrub layer (**peL2Z**, **epL2Z**). They have been modified in places to induce the growth of native grasses.

Several areas of saline or calcareous soils in southern Australia carry low woodlands of *Casuarina cristata* (**cl2Z**), often co-dominant with *Heterodendrum oleifolium* (**crL2Z**) and with an understorey of Chenopodiaceae.

Other examples of this subform, dominated by species of *Acacia* (**wL2Z**, **weL2Z**), are scattered throughout north-western NSW and central Qld. In some, especially those dominated by *Acacia aneura*, the appearance of a dense low shrub stratum of *Eremophila*, *Cassia* and *Dodonaea* species in the present vegetation is largely a consequence of pastoralism (Moore 1973). These 'woody weeds' have reduced the carrying capacity of grazing land over a wide area.

Large areas of calcareous earths to the north of the Nullarbor Plain are dominated by *Acacia papyrocarpa* and *A. aneura*, usually in association with *Casuarina cristata* (**wcl2Z**, **wL2Z**). Most of the low shrubs are Chenopodiaceae, especially species of *Maireana* and *Atriplex*. On the northern part of Wilson's Promontory (Vic.), the modification of former forest (**em3L**) by repeated fires has created the present shrubby low woodland (**xl2Z**).

Low woodland with hummock grasses

L2H

The rugged sandstone country of the central Kimberley region carries a low woodland characterised by *Eucalyptus phoenicea* and *E. ferruginea* over the hummock form of *Plectrachne pungens* (**eL2H**). *E. tetradonta* and *E. dichromophloia*, which dominate the nearby grassy woodlands (**em2G**), are also present. An adjoining area of shallow gravelly soils is dominated by species of *Melaleuca*, again associated with *P. pungens* (**mL2H**).

Patchy stands of *Acacia shirleyi*

and *Macropteranthes kekwickii* west of Newcastle Waters are more open than those described under **wL3**. These have *Triodia pungens* in the ground layer and are generalised on the maps as **wL2H**.

Some stony scarp country in northern and central Qld carries low *Acacia* woodlands (**wL2**) of *A. shirleyi* to the north and *A. catenulata* and *A. petraea* further south. Lower strata of hummock or tussock grasses may be present but are typically very sparse.

L2

Low woodland with tussock grasses

L2G

Grassy low *Eucalyptus* woodlands (e.g. **eL2G**, **emL2G**) are fairly widespread in tropical northern Australia but more scattered in the south-east. They tend to occur under lower rainfalls or on poorer soils than the corresponding woodlands (e.g. **eM2G**).

Eucalyptus dichromophloia is prominent in the northern low woodlands, together with *E. tectifera* in the NT and *E. cullenii* in northern Qld. *Callitris intratropica* and species of *Melaleuca* are co-dominant with *Eucalyptus* in some places; species of *Terminalia* are also prominent. Grasses include *Themeda australis* and species of *Aristida*, *Heteropogon* and *Sorghum*.

The distribution of the northern low woodlands is little changed except for small cleared areas south of Darwin (**xs1yG**) and near Prosperpine in Qld (**vg4**). Pastoralism has had a similar effect to that described under **M2G**.

The grassy low woodlands of south-eastern Australia have largely been cleared for pastures or cropping. The dominant species in the remaining areas include *Eucalyptus populnea* in the north, *E. pauciflora* in the south-east and *E. odorata* in the west, together with *E. largiflorens* on many inland alluvial flats. The grasses include *Themeda*, *Poa*, *Danthonia*, *Aristida*, *Stipa* and *Chloris*. Some *Eucalyptus largiflorens* woodlands formerly had a low shrub understorey of *Chenopodiaceae*.

Melaleuca low woodlands (**mL2G**), dominated by several species including *M. viridiflora*, occur on sandy alluvial plains across the north-east, especially in the Qld Gulf Country. The grasses include *Aristida*, *Chrysopogon* and *Eriachne*. An area dominated by *M. lanceolata* is mapped in swampy country in south-eastern SA.

Acacia aneura is the principal species of the low woodlands (**wL2G**, **weL2G**) in southern Qld and north-western NSW. These are a lower-rainfall extension of the *A. aneura* forests (**wM3**, **weM3**) and occur on the same distinctive red earths. As in the forests, *A. aneura* is often accompanied by *Eucalyptus populnea* or *E. melanophloia*, or sometimes by *Callitris glaucophylla* (**wpL2G**). Under the woodland canopy there is a grass stratum including *Thyridolepis mitchelliana* and species of *Eragrostis* and *Aristida*. Across central and western Australia, *Acacia aneura* is generally found as a tall shrub, but there is at least one example of *A. aneura* low woodland around the Warburton Range of WA (Beard 1974).

Other species of *Acacia* also form grassy low woodlands. In parti-

cular, *A. argyrodendron* and *A. cambagei* woodlands occur along the eastern margin of the *Astrebla* grasslands in central Qld. The isolated area mapped as **weL2G** east of Newcastle Waters is a mosaic of *Acacia shirleyi*, *Eucalyptus dichromophloia* and *E. leucophloia* over a ground layer of *Chloris*, *Aristida* and *Enneapogon* species.

Acacia low woodlands were formerly more extensive in inland Qld and NSW but thinning and clearing to increase native pasture growth has reduced large areas to **wL1yG** or **weL1yG**. In other areas native grasses have been reduced under grazing, especially by sheep. A great increase in low shrubs has created areas of **wL2Z** or **weL2Z** from former grassy woodlands around Bourke (NSW). To improve pasture productivity drought tolerant exotic grasses have been established in some cleared areas, for example the area shown as **yG2** around Blackall (Qld).

Some of the present areas of **wL2G** in north-central Qld represent a new and distinctive vegetation type. The exotic *Acacia nilotica* was introduced as a shade and fodder tree to the *Astrebla* grasslands but has become a weed (Bolton and James 1985). It is now widespread in these grasslands and has also appeared in some adjacent vegetation types. Heavily infested properties lie along the railway from Hughenden to west of Julia Creek, and around Winton. The cover of *Acacia nilotica* within these areas often exceeds 10%.

Some sandy or calcareous soils on the plains in western NSW are covered by low woodlands of *Casuarina cristata*, sometimes with *Heterodendrum oleifolium* as a co-dominant (**clL2G**, **crL2G**). The grasses include species of *Stipa*, *Enneapogon* and *Eragrostis*. There is a similar example in the salt country of WA. Some stands have been thinned out under pastoralism and an area near Griffith has been cleared for cropping. Further north a more mixed low woodland (**xlL2G**) includes not only the above species but also others from neighbouring units, such as *Callitris glaucophylla*, *Acacia loderi*, *A. aneura* and *Flindersia maculosa*. A smaller mixed area on the Murray River near Renmark (SA) has been modified by settlement.

In the NT some mixed low woodlands (**xlL2G**) contain not only *Eucalyptus* but also *Melaleuca*, *Acacia*, *Terminalia* and *Erythrophleum*. Again, the *Melaleuca* grassy low woodlands to the south-east of the Gulf of Carpentaria (**mL2G**) grade into similar woodlands with various dominants including species of *Lysiphylum*, *Albizia*, *Grevillea* and *Terminalia*.

Low woodland with other herbaceous plants

L2F

The only mapped example (**eL2F**) is a coastal area of former shrubby low woodland (**eL2Z**) in the present vegetation of south-eastern SA. It is still dominated by *E. baxteri*

but the understorey has been modified and is now largely exotic grasses, including *Lagurus ovatus*, and the native fern *Pteridium esculentum*.



Low woodland of snow gum in the Snowy Mountains
Low woodlands of *Eucalyptus pauciflora* with a diverse low shrub stratum (**eL2Z**) are prominent on mountain soils above 1500 m in southern NSW and Vic. Such low woodlands also occur at lower altitudes, especially on sites receiving cold air drainage. There is often a well developed ground layer dominated by species of *Poa*. Areas of comparable vegetation, dominated by *Eucalyptus coccifera*, occur at somewhat lower altitudes in Tas.



Low woodland of mulga near Eulo (Qld)
Mulga (*Acacia aneura*) low woodlands are widespread on the red earth country of south-western Qld. On stony residual country further west, mulga forms tall open shrublands. The usual ground cover of sparse tussock grasses is absent from this grazed stand, photographed during a period of drought.



Black box grassy low woodland
Black box (*Eucalyptus largiflorens*) is widespread on clay floodplains and lake basins in western NSW and Vic., where it usually occurs behind fringing woodlands of river red gum. Most stands of black box now have a ground cover of grasses, although many previously also had an understorey of chenopods, including old man saltbush (*Atriplex nummularia*).