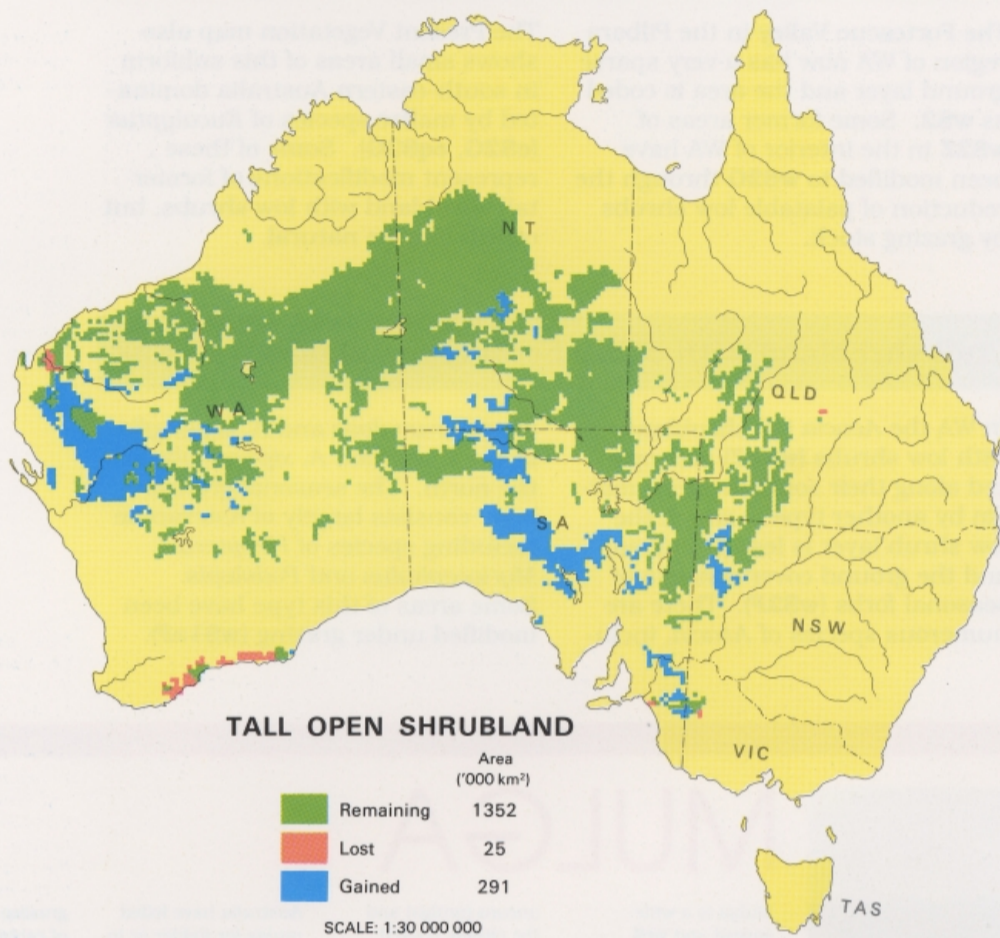


## Tall open shrubland Shrubs >2 m high; <10% foliage cover

S1



### Mallee-heath in the Stirling Range (WA)

*Eucalyptus tetragona* or 'Tallerack' is a prominent mallee species along the WA coastline from Albany to Cape Arid, where it forms a tall open shrubland over a dense and diverse heath understorey (eS1xZ). This vegetation type also occurs at the same latitude in the Big Desert of western Vic., where *E. incrassata* is a prominent species.



### Acacia tall open shrubland over bluebush

Across the southern inland this widespread vegetation type includes a number of *Acacia* species. The photo shows western myall (*A. papyrocarpa*) over low shrubs of pearl bluebush (*Maireana sedifolia*) near Rawlinna, on the western margin of the Nullarbor Plain. Western myall also occurs as a low tree.



Tall open shrubland is the single most widespread structural form of vegetation in Australia, covering more than 20% of the continent. Its area has actually increased slightly in historical times through reduction in the cover of denser shrublands.

The largest areas are found in desert sand country. There are many species of *Acacia* in the shrub layer, accompanied by other shrubs, mallees and scattered low trees. Tall open shrubland with a grassy or depleted understorey largely lies within the range of mulga, *Acacia aneura*.

Understorey types range from low shrubs to grasses and other herbaceous plants, or may be largely absent. Where the upper stratum is very sparse, this formation could perhaps be better described as scattered tall shrubs with the understorey as the characteristic feature of the vegetation.

### Tall open shrubland with low shrubs

S1Z

The 'mallee-heath' type (eS1xZ), dominated by species of *Eucalyptus*, occurs on sandy soils in the Big Desert area of western Vic. and SA, and on the south coast of WA. *E. incrassata* is widespread in this vegetation with *E. tetragona* prominent in the west. There is a dense sclerophyllous understorey including species of Proteaceae and Myrtaceae.

*A. aneura* is the most widespread species of *Acacia*, but others such as *A. linophylla* and *A. brachystachya* are also present. Some eastern areas are dominated by a wider range of genera (xS1kZ). The low shrubs include species of *Atriplex* and *Maireana*, together with more succulent types ('samphires', including *Halosarcia* and *Sclerostegia*) on the more saline soils.

Some areas of former mallee-heath have been cleared for seasonal crops or pastures, dependent on massive applications of fertiliser to overcome the infertility of the soil. Some present areas of eS1xZ in SA are modified shrubland and contain many remnants of the former mallee vegetation (eS2Z).

*Acacia* tall open shrublands with a low shrub understorey of Chenopodiaceae (wS1kZ) are common in the present vegetation across the southern interior of Australia. This type is more restricted to the Natural Vegetation map because many of the present-day occurrences are the result of a decline in cover of former tall shrublands (wS2Z).

Within the limits of the *Acacia* shrublands in WA, some rough stony areas carry open shrublands (wS1xZ) which are a depauperate extension of the wS2Z type. In north-western NSW the present area coded as wS1xZ reflects the development of a dense stratum of low shrubs which, under pastoral land use, has replaced the former grassy understorey (Booth and Barker 1981).

Over large areas of *Acacia* tall shrubland and some tall open shrubland (wS2Z, wS1xZ) in WA the cover in all strata has been reduced by grazing. These modified areas are shown on the Present Vegetation map as wS1.

### Tall open shrubland with hummock grasses

S1H

Acacias and mallee eucalypts are again the most frequent upper stratum dominants, although there are examples with *Hakea* (hS1tH) or various genera (xS1tH) dominant. This subform corresponds to the 'shrub steppe' of Beard (1967), with a uniform and conspicuous hummock grass layer beneath scattered tall shrubs.

*Eucalyptus* shrub steppe (eS1tH, ewS1tH) occurs throughout the central and western interior of Australia, associated with the sandplains and some interdune areas. The mallee species include *E. gamophylla* and *E. pachyphylla* in the north, *E. oleosa* and *E. youngiana* in the south and *E. kingsmillii* in the west. The mapped coastal outlier on the Cape Range in WA is dominated by a mallee form of *E. dichromophloia*. Species of *Acacia*, especially *A. aneura*, are prominent in some places (ewS1tH) and *Triodia basedowii*, with some

*T. pungens*, is the principal hummock grass.

*Acacia* tall open shrubland with hummock grasses (wS1tH) is the characteristic vegetation of large areas of sandplain, especially in the NT, and of the sandridge country in and around the Simpson and Great Sandy deserts. This type usually occurs within the 100–300 mm annual rainfall range. Examples are also found on other kinds of terrain, including desert laterite and the granitic plains and rough basaltic country of the Hamersley Range region of WA.

*Acacia*, represented by many species, is usually regarded as the typical genus. The tallest stratum, however, often includes a range of genera, such as mallee eucalypts and species of *Hakea* and *Grevillea*, which in places may be co-dominant with *Acacia* (e.g. wS1tH, whS1tH, xS1tH). Some species,

## S1

including *A. aneura*, *A. dictyophleba* and *A. ligulata*, are widely distributed; others, including *A. stipuligera* in the north, *A. pachycarpa* in the north-western deserts and *A. pyriformis* in the Hamersley Range region, have a more regional distribution.

Although the hummock grass layer is conspicuous, the plants are well spaced and the overall cover is relatively sparse. In places their density varies with drought or fire. The predominant species of *Triodia* are *T. pungens* in the north and *T. basedowii* in the south, although their ranges overlap. *Plectrachne schinzii* is a common associate of these species except in the south-east. Some areas of this vegetation

are grazed and frequently burnt to induce palatable growth on the hummock grasses. There is also some herbaceous feed available between the hummocks.

Most of the mapped areas are either unsuitable for domestic stock grazing, and remain vacant, or are devoted to other purposes. Large areas of the sandplains and dunefields lie within desert nature conservation reserves, or are Aboriginal lands where limited hunting and gathering remains the principal land use. It is evident from satellite imagery that fires are widespread in these areas, arising from lightning, European activities or Aboriginal burning practices.

## Tall open shrubland with tussock grasses

## S1G

Examples are scattered across Australia throughout the lower rainfall areas. *Acacia* is the most frequent dominant (**wS1yG**), sometimes associated with other genera (**whS1yG**, **xS1yG**). A few modified examples are dominated by mallee eucalypts (**eS1yG**).

This subform is more prominent on the Present Vegetation map because many of the examples result from changes to denser shrublands. Many areas that are coded as **wS1yG** reflect a reduction of the tallest stratum of former *Acacia* shrublands (**wS2G**). In SA present areas of **eS1yG** are a generalisation of remnant patches of degraded mallee within the wider landscape of seasonal crops and pastures; similarly, **xS1yG** results from the modification of former **xS2Z** or **xS1kZ**. The induced native pastures include species of *Stipa* and *Danthonia*. A small area mapped as **xS1yG** south of Darwin represents regrowth on formerly cropped land that was cleared from *Eucalyptus* woodlands (**eM2G**, **eL2G**).

Natural examples with *Acacia* dominant may be regarded as an extension of the grassy *Acacia* tall shrublands (**wS2G**) into drier areas (<100 mm annual rainfall) or on to poorer soils. One distinct environment is provided by the clayey soils of the interdune areas in the south-eastern Simpson Desert, where the species include *A. georginae*, *A. victoriae* and *A. tetragonophylla* (**wS1yG**).

There is a wide range of dominant species, some of which, including *Acacia aneura*, *A. victoriae* and *A. ligulata*, are widely distributed. Others, such as *A. kempeana* and *A. georginae* in central Australia, have a more regional distribution. The latter occurs on heavy soils to the north of the Simpson Desert, and on the clay interdunes on its eastern edge. Characteristic species of other genera include *Hakea leucoptera* (**whS1yG**), and the tussock grasses include *Aristida*, *Eragrostis* and *Enneapogon*. The ground layer, which fluctuates greatly with seasonal conditions, also contains a considerable forb component, including species of *Ptilotus* and *Sclerolaena* and members of the Asteraceae.

While most of the natural examples of mixed tall open shrubland (**xS1yG**) are similar to those dominated by *Acacia*, there are some limited but distinctive types such as that mapped on small areas of alkaline clays north of Charleville in central Qld (**xS1aG**). The dominant species include *Albizia basaltica*, *Lysiphylum carronii* and *Ventilago viminalis*, with a ground layer of *Astrelba*.

Some former areas of **wS1yG** have been modified by the reduction of the tallest stratum, as in the lower Ashburton Valley in north-western WA (to **yG3**). In north-western NSW the replacement of the grassy understorey by dense low shrubs is discussed under **wS1xZ** above.

## Tall open shrubland with other herbaceous plants

## S1F

In SA some former areas of *Eucalyptus* tall shrubland or tall open shrubland, with low shrubs (**eS2Z**, **eS1xZ**) have been partially cleared and sown to seasonal crops in association with pastures (**eS1yF**, **eS1yF**). The perennial sward-forming grasses include *Phalaris aquatica* and *Dactylis glomerata*; the seasonal grasses

include *Lolium rigidum*. The main legumes are the seasonal *Trifolium subterraneum* and *Medicago* species, but there is also some perennial *Medicago sativa*. In western WA, part of the *Acacia* tall shrubland with a seasonal ground layer of Asteraceae (**wS2F**) has been reduced under pastoralism to **wS1zF**.



## Mulga and mallee open shrubland on sandplain

Tall open shrubland over hummock grasses covers vast areas of arid Australia. *Acacia aneura* and *Eucalyptus kingsmillii* form an association on the sandplains to the east of Wiluna in WA (pictured). The hummock grass is *Triodia basedowii*.



## Open shrubland of the Simpson Desert

The linear sand dunes of the Australian desert country slice across the plains and form a vast mosaic of different dune crest and corridor vegetation. In these areas the map codes apply to the more extensive corridors and are underlined to indicate the presence of a separate sandridge vegetation (e.g. **wS1tH**). The Simpson Desert provides some of the most striking examples of this striped mosaic, as can be seen in these two photos. The interdunes and stable lower dune slopes carry open shrublands with a tussock or hummock grass understorey whereas unstable dune crests have a very sparse and distinctive flora including *Zygochloa paradoxa*, the sand-hill canegrass (foreground).



## Degraded mulga country in WA

Parts of the mulga in several states have suffered a decline in shrub density and ground cover as a result of pastoral land use. At their western edge, former *Acacia* shrublands with a low shrub understorey over grasses and forbs have lost much of both their shrub and ground layers and are now coded as **wS1**.

