

Other vegetation

Littoral complex

Low forest of grey mangrove in south-eastern Qld

Mangrove vegetation is best developed in the zone between mid-tide and high-tide and its characteristic form is that of low open forest, although its structure varies with the environmental gradient at right angles to the shoreline. The greatest diversity of species is found in the high rainfall area between Ingham and Innisfail in northern Qld. The grey mangrove (*Avicennia marina*) is the most widespread species, occurring in the seaward part of nearly all mangrove communities. It is the only species of mangrove in Vic. and SA, where it barely reaches 3 m in height and often occurs as a shrub.



Mangroves and mudflats, northern Australia

The ill-fated explorer Edmund Kennedy lost his life in the mangroves of Cape York Peninsula. Beale (1970) in his book about Kennedy, described such areas as: '...a monster spreadeagled in its own ooze and slime, to be touched at one's peril'. The image of mangrove swamps as useless and dangerous wastelands is rooted in Australia's colonial history, but is maintained even today to justify their draining and filling for development.



Red mangroves on the Top End shoreline

The plants which are found in the littoral zone are distinct from those of terrestrial habitats, although some strand line species occur on higher ground such as beach ridges. Littoral plants are adapted to high salt levels, waterlogging and the scouring effect of the tides; they exhibit such unusual morphological adaptations as are seen in mangrove roots and seeds. The red mangrove (*Rhizophora styloza*) has distinctive stilt roots which enable it to anchor in semi-fluid and accreting substrates and to overcome the anaerobic soil conditions.



A mosaic of different vegetation types occupies the extreme habitat of tidally inundated land around Australia's coastline. It is best developed on the wide tidal flats in the north, where there is low wave energy, a large tidal range and large estuarine sediment inputs.

At its most diverse, the littoral complex consists of a mosaic of mangrove stands, low shrublands, herbaceous communities and bare salt flats. It occupies saline soils within the limits of tidal flooding and is most prominent on the northern tropical shores, where extreme tidal ranges may be as great as 10 m. There are smaller, unmapped examples at many points along the extra-tropical coastline. Because of the variety of structural vegetation forms represented and its small total area, littoral vegetation is mapped as a complex.

The mangrove communities range in structure from closed forests to low open shrublands and in composition from assemblages of up to 30 species in northern tropical areas to pure stands of *Avicennia marina* on the southern coasts of the mainland. There are no mangroves in Tas. or on the southern coast of WA. A wide range of families is represented in the mangrove flora, notably the Rhizophoraceae. There are some deciduous trees (*Xylocarpus*) and even one species of palm, *Nypa fruticans*.

Mangrove stands usually occur on sites that are subject to regular tidal flooding. The other components are characteristic of sites that are less regularly flooded; under lower rainfall or markedly seasonal rainfall, the soils of such

sites tend to be kept highly saline by evaporation (Macnae 1966).

The low shrublands are more diverse in southern Australia and are dominated by succulent species of Chenopodiaceae (**kz2**); the principal genera represented are *Halosarcia*, *Sarcocornia* and *Sclerostegia*. In some areas these low shrublands tend structurally towards herbfields. The herbaceous communities are dominated by tussocky or tufted grasses and graminoids, often providing dense cover (**yG4**); *Sporobolus virginicus* is prominent among the grasses. Areas of extreme salinity are devoid of vegetation.

A striking feature of littoral communities is the zonation of species and vegetation types, which follows the gradient in environmental conditions at right angles to the shoreline. Mangroves are the most biologically productive component of the littoral vegetation and are recognised as important nursery habitats for the coastal fishing and oyster industries.

The total area of mangrove vegetation is about 11 500 km² (Galloway 1982). While the largest areas of mangroves occur on the northern shoreline and are little affected by human activities, in the south many swamps have been cleared, drained and filled for urban and coastal development.

Horticultural complex



The horticultural complex includes orchards and other fruit plantations, vineyards, and vegetable gardens. Examples are widespread in the more closely settled parts of the country, but only a few are large enough in area to be shown on the Present Vegetation map.

They are found in the vicinity of major cities, in irrigation areas and in other locations where climate and soil are suitable for this kind of land use. There are many small areas on alluvial flats along rivers in the south-east. In places the horticulture components are intricately mixed with sown pastures and seasonal crops.

Orchards of pome fruits (*Malus domestica* and *Pyrus communis*) and of stone fruits (species of *Prunus*) tend to occur towards the cooler climates and those of citrus fruits (species of *Citrus*) towards the warmer climates, but there is considerable overlap. Fruit plantations other than orchards occupy smaller and more localised areas. The principal fruits produced are

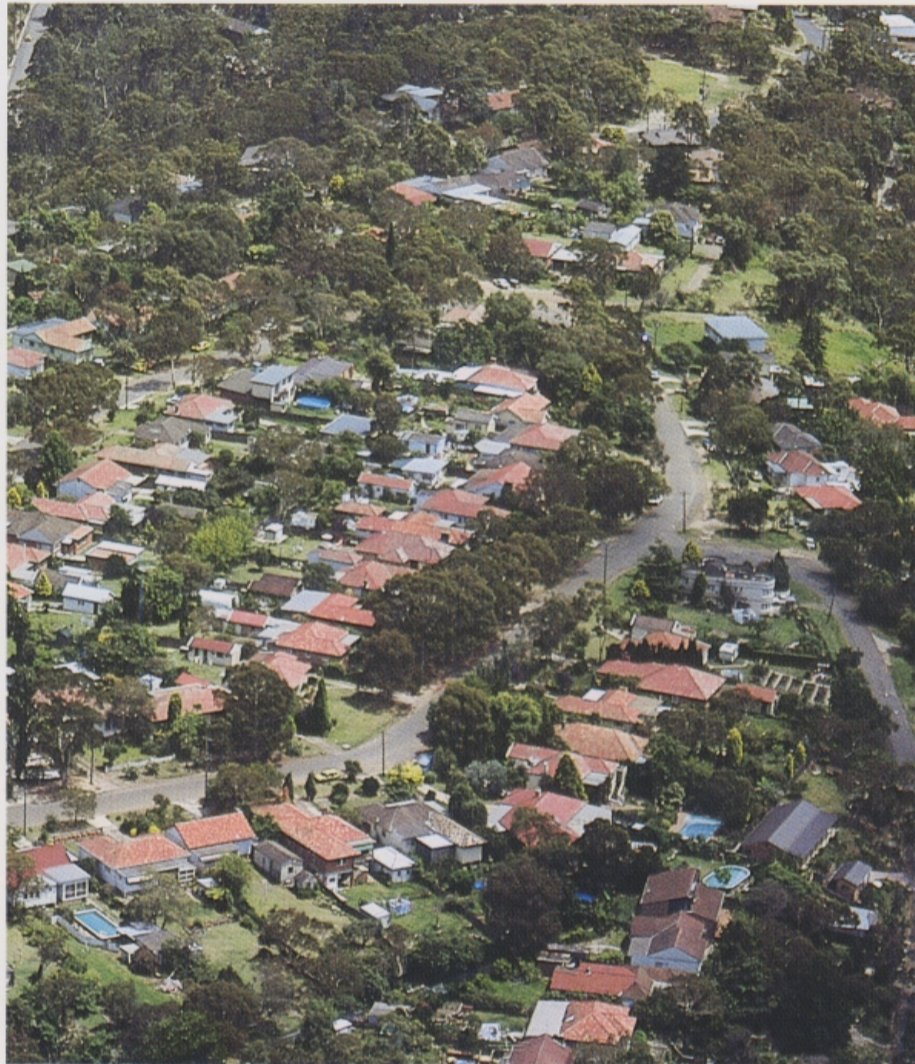
pineapples (*Ananas comosus*) in Qld and bananas (*Musa cultivars*) in north-eastern NSW and in Qld.

The largest concentrations of grapevines (*Vitis vinifera*) are in the irrigation areas associated with the Murray and Murrumbidgee rivers and in the vicinity of Adelaide. There are many smaller areas of vineyards in suitable locations throughout temperate Australia.

The principal vegetables grown are potatoes (*Solanum tuberosum*) and peas (*Pisum sativum*) although Australia's broad climatic range allows a great variety of vegetables to be produced. In the past, plantations of coconut palms (*Cocos nucifera*) were maintained in the Cocos Islands.



Urban complex



Northern suburbs of Sydney

With the retention of many of the original trees and extensive street plantings, the overall vegetation cover of some suburban areas is open woodland or woodland. The mowed lawns of gardens and parklands are similar in structure to dense sown pasture.

Intensive horticulture near Griffith (NSW)

This scene from the Murrumbidgee Irrigation Area (far left) shows intensive horticultural use of land, primarily for citrus orchards. The sown pasture paddocks in the foreground are a feature of the vegetation of this mapped horticultural area.

Urban vegetation in Australia often stands in stark contrast to the surrounding bush or farmlands. This is particularly so in drier areas because the use of large amounts of water, fertiliser and human intervention in towns and suburbs produces a green and well-regulated landscape.

The vegetation of urban areas is a diverse assemblage of both exotic and native species. The major components include the trees of streets and parklands, the grasses of lawns and the many ornamental and useful garden plants. The re-creation of European style parklands with exotic trees over turf lawns, which require large inputs of water, remains the norm in urban areas. However, there is a growing trend towards 'bush' gardens, which simulate natural vegetation with a range of native species.

Within large cities there are identifiable spatial patterns of vegetative cover. Inner-city and industrial areas are often devoid of vegetation. In contrast, in well-established and affluent suburbs, where there is more open space, extensive tree plantings or selective initial clearing often approximate the overall tree density of woodlands. While there may be sharp boundaries between urban areas and natural vegetation or farmland, in other areas they may merge with market gardens, intensive horticulture or hobby farms.



The mining town of Newman (WA)

The transplantation of the suburban environment to remote areas in inland Australia often creates strong visual contrasts. Abrupt boundaries often occur between the green watered gardens and the dry and sparse natural vegetation.

Banana plantation, northern NSW

The northernmost mapped areas of horticulture are near Yeppoon and Brisbane in Qld. Most of Australia's banana crop, however, is grown on fertile, well drained soils in northern NSW (far left).