



Mangrove forests

Mangrove forests form some of Australia's most important and widespread coastal ecosystems. They grow between the low and high tide zone of tropical, subtropical, and protected temperate coastal rivers, estuaries and bays.

Mangrove forests cover 750 000 hectares around the Australian coastline (Table 1 and Figure 1).

Mangrove forests generally range from 2–10 metres in height, but their structure and height vary with the environment. In high rainfall areas of far north Queensland, they may be 30 metres tall. In some temperate and highly salty areas on the inland side of tropical mangrove stands, trees may only reach one metre, and therefore be too short to be classified as forest.

Mangroves can form dense, almost impenetrable stands, often dominated by only one or two species.

Australian mangrove forests consist of 40 species from 19 families of plants, which vary with tidal inundation and latitude. White mangrove (*Avicennia marina*) is the most widespread and common. Several other salt-tolerant species may grow in mangrove forests. For example, the mangrove palm (*Nypa fruticans*) occurs in tropical mangrove forests, while the mangrove fern (*Acrostichum speciosum*) inhabits the mangrove forest floor. Ferns and orchids grow on the trunks and branches of mangroves in tropical areas.

Mangrove species are adapted to tidal inundation and high salinity in coastal estuaries, inlets and bays. They deal with salinity in two ways: by keeping out the dissolved salt as their roots absorb water, or by absorbing the salt and then extruding it through special glands in their leaves.

Mangroves have adapted to low oxygen levels in the deep, muddy soil by evolving aerial or breathing roots (see following box) that grow up through the water into the air.



Mangrove forest, Lockhart River, northeast Cape York, Queensland



The transition from mangrove forest to Rainforest, Daintree Rainforest, Queensland

Mangrove roots

All plant roots need oxygen from the surrounding soil in order to survive. But the soft sediment in which many mangroves grow is frequently low in oxygen. To cope with this, most mangroves have developed aerial roots (or pneumatophores) that rise above the surface of the mud. These are designed to allow air to reach the deeper roots that absorb water and nutrients. The shapes of the aerial roots vary enormously, but the three most conspicuous types are pencil roots (found in *Avicennia* species), knee roots (found in *Bruguiera* species) and stilt roots (found in *Rhizophora* species). The true root systems of mangrove trees are shallow, and extend less than two metres below the surface. However, they spread horizontally in a dense mass over large distances. Many mangrove species are unusual because they have a greater proportion of plant material below the surface than above. This is another feature that helps them to remain anchored in soft mud.

Mangrove forest, Northern Territory



Table 1: Area of mangrove forest by crown cover compared with total native forest (hectares)

	Woodland	Open	Closed	Unknown crown cover	Total
Mangrove	25 000	266 000	325 000	132 000	749 000
Total native forest	102 526 000	45 603 000	4 644 000	9 907 000	162 680 000

Source: National Forest Inventory (2003) *Australia's State of the Forests Report*

Figure 1: Mangrove forest distribution



Source: National Forest Inventory (2003)

Note: The distribution represented on this map has been enhanced for clarity

Where are Australia's mangrove forests?

Mangrove forests are widespread in tropical, subtropical and some temperate regions of the world. In Australia, most mangrove forests are located in the tropical northwest, north and northeast, but there are isolated stands in Victoria, South Australia and in temperate Western Australia (Figure 1). The southern-most occurrence of mangroves in Australia is at Wilson's Promontory, Victoria.

Tropical mangrove forests are the most diverse and widespread, with the greatest concentration of species along the northeast coast of Queensland. The number of species decreases further south due to lower winter temperatures, and from east to west across the tropics as rainfall decreases. Some scientists consider mangroves to be a special form of tropical rainforest, because they have many families of plants in common. In Australia, however, mangroves have traditionally been considered a separate vegetation type.

Table 2: Tenure of mangrove forest, by State and Territory (hectares)

Tenure	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
Leasehold land	0	0	44 000	18 000	2 000	0	0	20 000	85 000
Multiple-use forests	0	0	0	0	0	0	0	0	1 000
Nature conservation reserves	0	1 000	4 000	22 000	3 000	0	1 000	37 000	69 000
Other crown land	0	0	11 000	46 000	3 000	0	0	106 000	166 000
Private land	0	1 000	261 000	61 000	1 000	0	1 000	4 000	329 000
Unresolved tenure	0	0	36 000	48 000	11 000	0	0	5 000	99 000
Total mangrove forest	0	3 000	355 000	196 000	19 000	0	2 000	173 000	749 000

Source: National Forest Inventory (2003) *Australia's State of the Forests Report*

Ownership and management

Reflecting their predominantly tropical distribution, the greatest area of mangrove forest is in the Northern Territory, while Queensland and Western Australia have most of the remainder. More than 40% are on privately managed land, which includes Indigenous land (Table 2).

Values and uses

Wood

Historically, many mangrove species provided useful products, such as tannin, wood for poles, firewood, charcoal and occasionally milled timber. Australian mangrove forests, however, are no longer harvested commercially for timber.

Environmental

Mangroves play important roles in the ecology of wetlands and estuaries. By reducing the speed of currents and trapping sediments, mangroves help to reduce silt accumulation in adjacent marine habitats. In addition, riverborne nutrients and chemicals are trapped and recycled within mangroves. They provide habitat and breeding sites for birds, fish and other wildlife. They are also highly valued for their unique biodiversity.



Mud crab (*Scylla serrata*)



Mangrove stands

Indigenous uses

Mangroves are also an important resource for Indigenous people in the Northern Territory. The plants are a source of honey and fruit, as well as medicines. Mangrove worms, found within decaying mangrove wood, are used as food. The timber can be used for implements, firewood and construction. Many edible fish, crabs and other shellfish are harvested from mangrove swamps.

Other uses

One of the key beneficiaries of mangroves is the fishing industry. A high proportion of the commercial and recreational fish catch around Australia are species that require estuarine habitat for at least part of their lifecycle. These include barramundi (*Lates calcarifer*) and banana prawn (*Penaeus merguinenensis*). Many mangrove forests provide nursery areas for these valuable fish. It has been estimated that 75% of fish and prawns caught commercially in Queensland spend at least part of their lifecycle in mangroves.

Some mangroves have leaves that are palatable for livestock when other food is unavailable.



The transition from mangrove forest to rainforest,
Daintree Rainforest, Queensland



Claire Howell

Mangrove



Acknowledgements

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