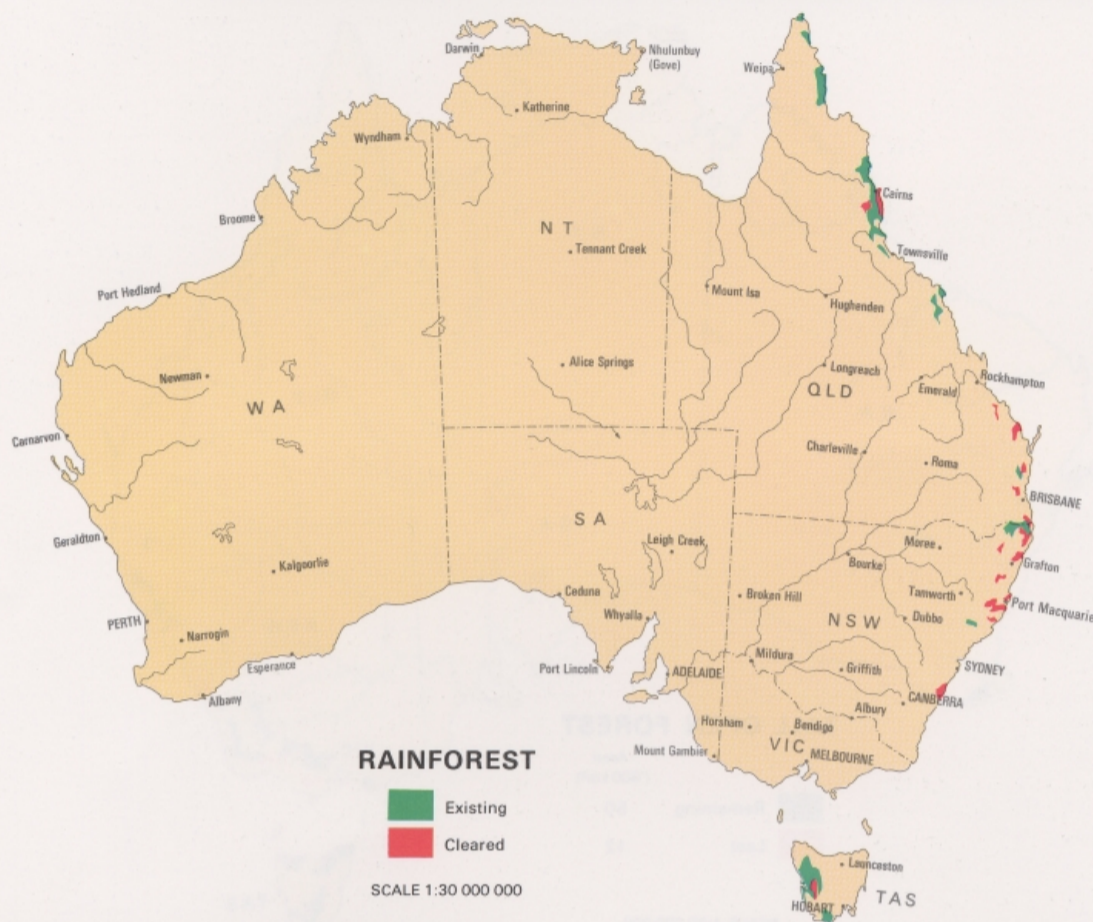


# Medium trees

## Closed forest

Trees 10–30 m high; >70% foliage cover

M4



Most of the native closed forests fall into the category loosely known as 'rainforest', which covers a diverse range of types from the cool temperate southern beech forests in Tas. to the tropical vine forests of Cape York. Small rainforest patches also occur in the Top End of the NT and in the Kimberley region of WA. The closed forest category also includes some planted forests of introduced pines.

Rainforests presently cover around 20 000 km<sup>2</sup>. While it is difficult to determine their total former extent, it is clear that a large part of the original rainforest has been lost. However, the future of Australia's remaining rainforest now seems secure, with large sections conserved in national parks and other reserves and, more recently, within World Heritage Areas.

Rainforest distribution is indicated in part by the bounded areas on both 1:5 million scale maps, but it is amplified by the symbols used to represent smaller patches. It should be noted that these symbols are limited to stands covering more than 500 ha, and to vegetation over 10 m in height; isolated symbols usually represent agglomerations of smaller patches in the same general area.

Most rainforests occur in areas of high rainfall (>1200 mm annually) which ranges in different places from fairly uniform to markedly seasonal. In addition, they are found from sea level up to altitudes of more than 1200 m and on a wide range of soil types. Their environmental relationships are complex, as reflected in their classification (Webb 1959, 1968; Webb and Tracey 1981) which has had to be greatly generalised for the maps.

There are four broad climatic groupings of Australian rainforest. Tropical rainforest occurs in north Qld, subtropical and warm temperate types from Mackay (Qld) to east Gippsland (Vic.), and cool temperate rainforest in Tas. and Vic. These groupings correspond respectively to Webb's 'mesophyll vine forest', 'notophyll vine forest', 'microphyll fern forest' and 'nanophyll moss forest'.

Most of the rainforest trees are evergreen, although there are some deciduous species. Most are also orthophyllous, but again there are exceptions. The mesophyll vine forests typically consist of large numbers of species and have a complex structure of mixed tree heights with various specialised growth forms. Many of the notophyll vine forests exhibit similar characters, being distinguished mainly by the smaller leaves.

Because of their complexity, all mesophyll and notophyll rainforests are mapped simply as **xM4** without reference to subforms. There is a reduction in floristic diversity and structural complexity in the transition from notophyll vine forest to microphyll fern forest. The nano-

phyll moss forests can consist of little more than a fairly uniform tree stratum, and are often dominated by a single species—*Nothofagus cunninghamii* (**nM4**).

There are many variations of this pattern, resulting from seasonal drought, increasing altitude and decreasing soil fertility. For example, another species of *Nothofagus*, the larger leaved *N. moorei*, dominates some closed forests at higher altitudes in north-eastern NSW, with outliers in south-eastern Qld. One such area is mapped (**nM4**) on the Barrington Tops, north of Newcastle (NSW).

The classification of closed forests is further complicated by the occurrence of emergents above the general forest canopy. In particular, there is a tendency for species of *Araucaria* to occur as emergents above some closed forests in Qld and northern NSW (Webb 1959) and for species of *Eucalyptus* to do the same in Tas. Such stands may be regarded as stages in long-term transitions, the taller stratum being the relict element.

Rainforests are more extensive on the Natural Vegetation map. Some areas have been cleared for sowing to exotic pastures (**yF4**, **eM1yF**), to induce the growth of native pastures (**yG3**, **eM1yG**) or for the establishment of plantations of sugar cane (**vG4**). The presence of remnant eucalypts in some cleared units reflects the mosaic nature of the areas generalised as rainforest. A large area of open scrub (**xs3G**) in western Tas. appears to be the product of a series of fires in former *Nothofagus* rainforest (Kirkpatrick 1977).

Rainforests also occur on several Australian islands beyond the limits of the maps. These are Lord Howe Island, where the forests are largely preserved; Norfolk Island, where the forests have mostly been cleared and sown to exotic pastures; and Christmas Island (Indian Ocean), where the forests have been subject to clearing for phosphate mining.

The Present Vegetation map includes a special category of closed forest, namely the plantations of exotic pine trees (**pM4**) in south-eastern and west-central Australia. *Pinus radiata* is the principal species planted in the southern states, with *P. pinaster* also common in WA. Although there is a large number of pine plantations, only a few areas are large enough to be represented on the map.

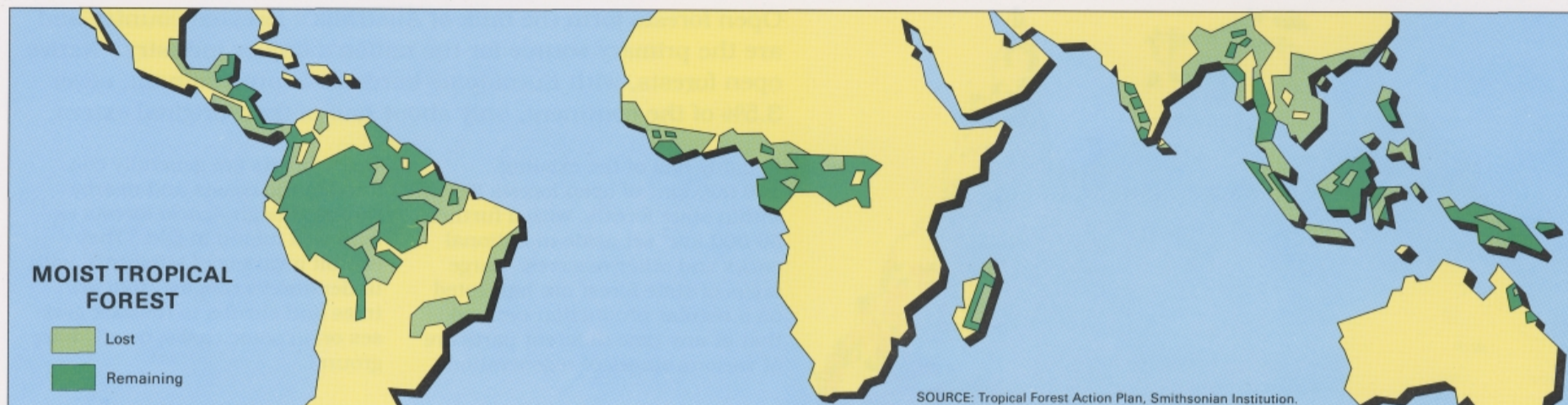


### Southern beech rainforests

The genus *Nothofagus* is confined to the southern hemisphere. In Australia, two major species dominate the cool temperate rainforests. The negrohead beech (*N. moorei*) is restricted to small areas in the highlands of northern NSW (pictured above) and south-eastern Qld, while the myrtle beech (*N. cunninghamii*), right, is widespread in Tas. and also occurs in eastern Vic. Another species, the deciduous *N. gunnii*, occurs in low closed forests in highland parts of Tas. *Nothofagus* forests are structurally simple; they often have a single dominant species and contain few specialised growth forms other than ferns and mosses.



M4



**Original and present extent of the world's moist tropical forests**  
Tropical rainforests represent most of the world's broadleaved closed forests. Only the largest existing areas of wet tropical rainforest are shown, along with an estimate of its extent prior to human clearing. In Australia the term 'rainforest' includes the native temperate closed forests.

**What is a rainforest?**

The popular conception of a dim and damp jungle where little light filters through a high canopy to the mosses, ferns and leaf litter below serves as a useful identifier of rainforest. A definition which encompasses the diversity of specific regional types of Australian rainforest is difficult to obtain, but in structural terms it is a dense

formation of diverse tree types, floristically distinct from the surrounding *Eucalyptus* forests. Rainforests are distinguished from other closed forests by the presence of growth forms such as epiphytes, lianes, mosses and ferns. Of course, there are many transitional types and mixtures of sclerophyll forest and rainforest species.

**Why conserve rainforest?**

Although Australia's rainforests are only a small fraction of the world total, they have evolved in relative isolation for many millions of years and are therefore unique. They have been described as a cradle of flowering plant evolution and constitute limited habitats where large numbers of primitive organisms have survived.

Rainforests are reservoirs of genetic diversity providing material benefits such as medicines and foods. They also offer a unique recreational experience for both present and future generations. Rainforests are an integral part of the global ecosystem on which human life depends. Worldwide, they are being cleared at an alarming rate.



The largest tracts of rainforest in Australia extend from Cooktown to Ingham in northern Qld and in total they cover over 6500 km<sup>2</sup>. The extent of rainforest vegetation in this region is highlighted on the map (right), produced digitally from a mosaic of five Landsat satellite images.

Areas of rainforest are coloured blue. The surrounding *Eucalyptus* open forest and woodland are shown green and the open woodland and grassland further inland are yellow. Cleared agricultural land appears orange-red.

There are various structural types of rainforest in this area, ranging from the complex mesophyll vine forest of the lowlands to the simple microphyll vine-fern forests of the cloudy wet highlands. The most widespread type is mesophyll vine forest which covers over 2000 km<sup>2</sup> (Rainforest Conservation Society of Qld 1986).

In 1989 most of the wet tropical rainforests in this region were included in the successful nomination of an area of World Heritage by the Commonwealth in an effort to secure their protection from further development.



**Northern Qld rainforests**  
Upland microphyll vine-fern forest (above), clothed in mist, among the granite boulders on Thornton Peak (altitude 1400 m), north of the Daintree River. Inside the jungle of a mesophyll vine forest (left) near Cape Tribulation. These examples represent the diversity of rainforest types in northern Qld and include differences in leaf sizes, growth forms and structural complexity, and types with deciduous elements or emergents.