

## Ecology

### Flowering & Pollination

Eucalypts flowers depend on birds, flying foxes and insects for their pollination. Those with copious nectar can attract Flying Foxes (e.g. Forest Red Gum, Swamp Mahogany, White Mahogany, Pink Bloodwood). Others, such as Tallowwood are poorer in nectar and rely on insects. Most local species flower annually, except for Grey Gum (biennially). Flowering time and abundance differ from year to year and species to species.

### Fruit and Seed

Ripe fruits open in warm dry weather, after fire, or when they dry out after they have been dislodged from the tree. The seed is fine but seldom spreads more than a tree height from the parent tree. The bulk of the seed released from each capsule is sterile (called *chaff*). Germination requires moisture, and the seedlings are very small. In cases where the ground is covered in leaf litter or shaded, small seedlings are likely not to thrive and to succumb to fungus attack. Seedlings of most species survive best in bare mineral soil caused by flood, slips and machinery or soil where fire has removed the litter.

### Fire

Apart from the adaptation to post fire colonisation of litter-free soil, most eucalypts are well adapted to surviving fires. After fires, and depending on the species, age and fire intensity, they re-shoot from epicormic buds (under the bark) or from lignotubers (woody underground stems).

### Associated Species

Many animal species rely on eucalypts. Birds, bats and insects eat the nectar. Birds eat seeds, lerps (Sweet secretions of *Psyllid* insects), and insects that use the trees. Mammals (e.g. Koalas) eat leaves. Their preferred local species include Forest Red Gum, Tallowwood and Grey Gum. Old trees provide nesting hollows for birds, bats, arboreal marsupials and reptiles. Humans use the timber, they cultivate eucalypt plantations, and they manage eucalypt forests.

### Management and Restoration of Eucalypt Forests

Locally, eucalypts regeneration has largely depended on natural regeneration after fire, slips and floods, but this is hard to manage artificially, and seedlings nowadays have to compete with vigorous weeds such as Lantana. Traditional minimal disturbance bush regeneration techniques seldom create the conditions for seedling germination and survival, and usually have to be supplemented by fire or removal of litter. Plantings depend on good species selection, but given the diversity of native species, the variability forest types over the landscape, and the changes to the natural soil condition, it is not always easy to predict what will do well. The best rule of thumb is to use local species from adjacent forest growing in similar soil.

### Further Reading

Bale, C.L. 1998 *Eucalypts and Angophoras of the North Coast of NSW*. (4<sup>th</sup> printing). Armidale, NSW: Botany Department, University of New England

Florence, R.G. 1996. *Ecology & Silviculture of Eucalypt Forest*. Collingwood, Victoria: CSIRO Publishing

Hall, Norman, Johnson R.D, Chippendale, G.M. 1975, *Forest Trees of Australia*. Canberra 1975: Australian Government Publishing Service

Harden, Gwen J. 1991. *Flora of NSW* (Vol 2), Kensington, NSW: NSW University Press

Hay, Ashley. 2002. *Gum: the story of eucalypts and their champions*. Sydney: Duffy and Snellgrove.

National Park Association & Ecological Australia 2013, *Diversity and Values of Eucalypt Forests of the Coffs Harbour Region*, Northeast New South Wales

<http://www.coffsharbour.nsw.gov.au/our-environment/projects/documents/nensw-eucs-report-final.pdf>

Williams, Jann E., & Woinarski, John C.Z. (eds). 1997. *Eucalypt Ecology: Individuals to Ecosystems*. Cambridge: Cambridge University Press

# EUCALYPTS OF COFFS HARBOUR & UPPER ORARA

## A guide to their recognition

### What is a Eucalypt?

The word Eucalypt, in its broad sense refers to several similar and closely related groups (or genera) of trees. As well as the *Eucalyptus* genus, these include the Bloodwoods (*Corymbia*), the Angophoras (*Angophora*), Brush Box (*Lophostemon*) and Turpentine (*Syncarpia*). The term 'gum' is also applied to all of these, although it is also used more narrowly to refer to smooth-barked eucalypts.

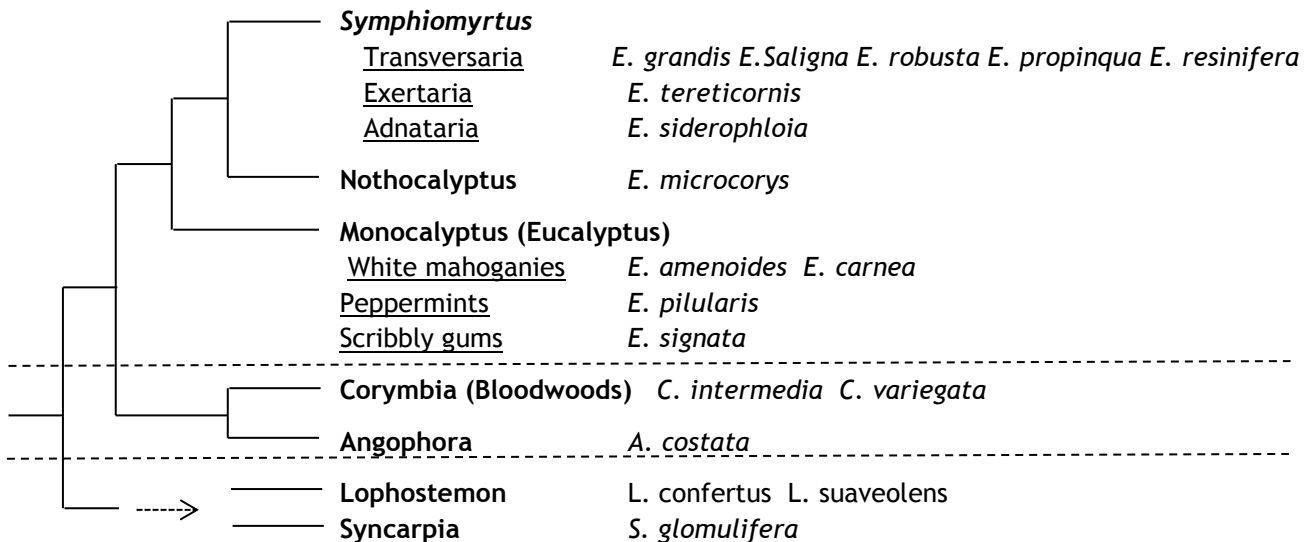
The name *Eucalyptus* comes from the Greek meaning 'well called' (*eu* - *calypt*). It refers to the little caps or *calyptras* that are shed from the buds to reveal the stamens. Only *Eucalyptus*, in the strict sense, and the Bloodwoods have this feature. Even so, Bloodwoods are believed to be more closely related to the *Angophora* than to the *Eucalypts*. A family tree below shows the relations of the trees described in this guide.

### Evolution of the Eucalypts

There is evidence of eucalypt-like species dating from at least 25,000,000 years ago. A branch of the Myrtle Family, they became more common as Australia became drier and the once extensive rainforest contracted. During the last 2,000,000 years, gradual drying coupled with repeated Ice Age cycles have seen the increasing differentiation of the eucalypts into hundreds of species adapted to nearly every combination of soil, water and temperature that the continent had to offer.

Up until 100,000 years ago, the drier landscapes of Australia were dominated by casuarinas, callitris (native cypress), acacias and grasses. Only in the last 100,000 years have the eucalypts actually come to dominate the majority of Australian landscapes. This may be due to the presence of humans. Although fire has been part of Australian landscapes for millions of years, the use of fire as a landscape tool is probably led to increased fire frequency across the continent, and the eucalypts had evolved very good adaptation to fire.

### Family Tree of the Eucalypts and Their Close Relatives



# EUCALYPT RECOGNITION

## Key Features

There are a number of key features to look for when distinguishing one species of eucalypt from another:

**Bark:** Is the bark smooth or rough? Smooth barked eucalypts shed their bark each year (usually in summer). Is it shed in long ribbons or small patches? Is some rough bark retained at the base of the trunk? What colour and texture is the smooth bark. Rough barked eucalypts retain their bark. Is the bark stringy, shortly fibrous, matted or hard? Is it in small tiles (tessellations) or deeply furrowed? What colour is it?

**Fruit:** Also called *receptacles*, capsules or ‘gum nuts’. Is the fruit large or small? Do the little valves that open on the top to release the seeds stick out above the rim of the capsule (*exerted*) or are they enclosed within the rim of the capsule. Does the rim slop up (ascending) or down into the capsule (*descending*)? Is the fruit hemispherical, bell-shaped, urn-shaped or conical?

**Location & Habitat:** Where a eucalypt grows is very important for recognition. Of the 700-800 species only about 25 or so grow naturally in the Coffs and upper Orara region. Planted specimens from outside this area can be difficult to identify. Each local species has its preferred soil and water conditions. Flooded Gums like the fertile, better-drained soils and lower slopes. Blue Gums and Tallowoods like moist gullies and ridges. Blackbutts and Red Mahoganies like well-drained soils on ridges or coastal hills. Red Gums like heavy coastal soils and floodplains. Swamp Mahoganies like swamp and its edges. Most of the eucalypts in this guide are trees of tall forest, ranging from moist shrubby Wet Schlerophyll Forest to drier ridge-top Wet Sclerophyll and Dry Schlerophyll. Forest Red Fums are often in Grassy Woodland.

**Buds:** The buds consist of a base (the floral tube) and a cap (*calyptra*) that falls off to reveal the stamens. What shape is the cap? Is it long and conical like a dunces cap, rounded and peaked like a minaret or like one of Bib & Bub’s caps?

**Leaves:** are the leaves the same on both sides (*concolourous*) or darker on top and paler below (*discolourous*)? Are they opposite one another (*Angophora* and juvenile *Eucalypts*), are they alternate (adult *Eucalypts*), or are they in whorls - i.e. several radiating from one place on a branch (usually the end) of the branchlet (Brushbox and Turpentine)? Are the veins evenly spaced? What angle do they make with the mid-vein?

## How to use the Table and Key.

This recognition guide gives two tools for eucalypt recognition: a table and a key. Both treat the bark as the primary feature. The table lists several features for each species. The key is used by making a choice at each branching point of a ‘tree’ diagram, and following the chosen branch to the next branching point until you arrive at the identification.

**Note:** Not all the Coffs-Upper Orara species are included. Only the most common. And the tools will not work on planted imports

**Common Species of Neighbouring Areas (but rare or absent in Coffs Harbour hinterland):** There is only one ironbark common in the area (*E. siderphloia*). There are several ironbark species though and closer to Grafton in the lower Orara and along the Pacific Highway. The Southern Spotted Gum, *C. maculate* occurs south of the Kalang-Nambucca valleys. New England Blackbutt (*E. campanulata*) occurs on the eastern Dorrigo plateau. All the species in this guide are also common in the Bellinger Valley except for Scribbly gum and Northern Spotted Gum.

**Commonly Planted non-local species:** Cadaghi, *Corymbia torreliana*, Lemon Scented Gum (*Corymbia citriodora* - similar to and closely related to the local Northern Spotted Gum).

