

Fraser Island's Flora

The rugged terrain of Fraser Island is clad with a diversity of vegetation ranging from luxuriant tall rainforest to heathlands and mallee growth. The island has over 750 vascular plant species. This incredible volume of Fraser Island's biomass grows only in sand, with relatively little nutrient. While the taller forests draw their nutrients from the concentration from a subsoil (B horizon) provided that it is accessible to the plant roots, the more impoverished plant communities rely for their nourishment on the small quantities of plant nutrients which are voraciously re-cycled. There is a clear nexus between forest types and the dune systems which determine the available nutrients.

This FIDO Backgrounder is based on John Sinclair's "Discovering Fraser Island and Cooloola". It attempts to include the Kabi Aboriginal names for the various species according to Watson. These appear in a different type to the rest of the text after the scientific names. In New Zealand the common names for the majority of forest trees are their Maori names. FIDO would like to see Aboriginal tree names preserved where possible.

Dune Systems

Another Backgrounder describes in greater detail the processes of soil formation on sand dunes resulting in the various dune systems. It also addresses how plants extract the nutrients that enable all plants to grow on the seemingly infertile dunes. Because the depth of the soil profile and the dune systems are so influential in determining the plant communities, in this Backgrounder, a simplified explanation describes the different dune systems.

Dune System 1 has no developed soil profile. There is no clearly defined A or B horizon. Mainly pioneer species such as casuarinas [Billai], coastal banksias [Walum], pandanus [Winnam] and Cypress pines [Kululu] occur here.

Dune System 2 has a soil profile starting to develop but it is a relatively thin A Horizon and an embryonic B Horizon. This allows the occurrence of Eucalypts (scribbly gums) and Corymbias (Moreton Bay Ash [Kauwandhur or Kurandhur] and bloodwoods [Bunar]).

Dune System 3 has a better developed soil profile with an even more enriched but deeper B Horizon. Much larger trees grow on Dune System 3. Blackbutts [Kwai'yi] are virtually confined to Dune systems 3 and 4.

Dune System 4 has a very well developed soil profile. The B Horizon is still thicker and deeper than Dune System 4. This system supports most of the rainforest and wet sclerophyll (Syncarpia –Brush Box) forests and they feed on the more abundant nutrients of the B Horizon here.

Dune System 5 is where the soil profile is so deep that the nutrients in the still thicker B Horizon are far too deep to be accessible to the plant roots even of the very big trees. In this Dune System because the plants have to rely on only recycled nutrients, the forest regresses. The lack of dominance of larger trees allows a greater diversity of wildflowers to compete. *Banksia serrata* [Wallim] is found in this dune system and rarely in 1 & 2.

Dune System 6 represents a stage further in retrogressive plant succession. The tree canopy is lower and trees sparser. Many tree species which survive here exhibit mallee growth forms with multiple stems rising from one lignotuber. It is here on the oldest dunes and in the swamps that the more colourful heathlands are found.

Forest Types

The Satinay Brush Box Vine Forests: One of Fraser Island's most famous features is the luxuriant Vine Forests, frequently referred to as either "scrubs" or as "rainforests". Technically, this forest type is - notophyll vine-forest.

The two dominant trees in this vine-forest are Satinay [Bivin or pibin] (*Syncarpia hillii*) and Brush Box [Dhinkar] (*Lophostemon confertus*). Pibin was once also known as "Fraser Island Turpentine" but builders resisted buying it because of its tendency to warp. Once this problem was overcome in the mid-1950s, marketing consultants invented and began applying the name "Satinay" to the timber which has been inappropriately applied to the forest trees. Pibins are virtually endemic to Fraser Island and the nearby Cooloola Sandmass. Satinay can be recognised by its darker leaves and its heavily grooved dark grey bark.

Other trees which appear in this vineforest are two species for the ancient Araucariaceae Family — Kauri Pine [Nunmulo or Dundathu] (*Agathis robusta*) and Hoop Pine [Kunyar] (*Araucaria cunninghamii*). While Hoop pine is widely distributed in many Queensland vine forests, on Fraser Island outside plantations, it occurs only north of Eli Creek but there it is widely distributed.

One of the most common trees in the under storey of these "scrubs" is a medium-sized, small, shiny-leaved shrubby tree, Carroll [Carroor or Kauar] (*Backhousia myrtifolia*), which gives the scrub its traditional fresh, musky smell.

Other "scrub" trees found on Fraser Island are Piccabeen Palms [Pikki]. (*Archontophoenix cunninghamiana*). The more valuable minor species of rainforest trees include Bumpy Ash, White Beech [Kalowen], Quandong [Colhoon] and Bennett's Ash.

The "scrubs", or notophyll vineforest, occupy only approx. 10,000 hectares or 5% of Fraser Island's total area. Only 24,000 hectares or 16% of Fraser Island's total area carries tall forest. The Hoop Pine forests cover about 2,400 hectares (all north of Eli Creek).

In Wangoolba Creek, two plants especially worth noting, other than the normal tree ferns, are the most ancient tree fern, King Fern (*Angiopteris evecta*), and the attractive climbing pandan – (*Freycinetia excelsa*). Another vine *Flagellaria indica* [Yurru] also commonly occurs here and in other vine forests.

Blackbutt Forests: Usually found surrounding the vine scrubs are the best types of Blackbutt (*Eucalyptus pilularis*) [Kwai'yi] forests. These forests include the even more valuable Tallowwoods (*Eucalyptus microcorys*) [Ti]. The Blackbutt forest covers 12,000 hectares (or 8% of Fraser Island). Blackbutt is almost exclusively confined to dune systems 3 and 4. Blackbutt was preferred over rainforest timber and for over a century these forests provided more than half the timber harvested from Fraser Island.

Fraser Island Plant Communities

Scribbly Gum Forests: On the edges of the Blackbutt forests, on the better drained, higher country, are found the non-commercial but picturesque Scribbly Gum-Bloodwood forests. The Scribbly Gum (*Eucalyptus racemosa*) gains its name from a small insect which tunnels into the bark surface and scribbles all over the tree. The trees have colour, shape and character.

In this zone grows also some Forest Red Gums [Yura or Yirra] (*Eucalyptus tereticornis*), Iron Bark [Tubun or Tubvan] (*Eucalyptus paniculata*) and Smooth Barked Apple [Dhomba] (*Angophora leiocarpa*). The flesh coloured bark of the Angophora and the twisting, writhing curves create a sexy image for this tree, usually found nearer the tops of the ridge.

One of the more common under-storey shrubs is *Monotoca scoparia*, and twining around it all is the parasitic Air Vine (*Cassytha* spp.).

Mangroves and Wetlands: Mangroves are limited to the Western parts of Fraser Island and except for a few creek estuaries they are extensive only between Moon Point and Snout Point. Thirteen species of mangroves have been recorded on Fraser Island. The most common mangrove is White Mangrove [Pirri] (*Avicennia*), with Red Mangrove (*Rhizophora*), with its seething mass of prop roots, a close second. Other mangrove species include *Bruguiera*, *Aegiceras*, *Ceriops*, and *Osbornia*. Exploration of the mangroves usually requires heavy protection with insect repellent and thorough cleaning of mud afterwards.

Mangrove forests are probably the most productive ecosystems in the world. They have been recorded in Queensland to produce 1000 tonnes per hectare of material which is fed into the food chain. They still hold fascination for a growing number of intrepid explorers.

Heathlands: Due to the absence of taller, more vigorous trees, this is an area where weaker plants with lower nutrient requirements can prevail and have an opportunity to grow. Here they produce prodigious displays of colourful flowers in an attempt to replicate themselves.

Shrubs of *Phebalium woombye*, Wedding Bush (*Ricinocarpus pinifolius*) and *Leptospermum* display clouds of white flowers in August and September. Wild Hops (*Dodonaea*) provide another dimension to the flora. Purple Hovea (*Hovea longifolia*) and a variety of yellow pea-like flowers (*Pultenaea villosa* spp., *Daviesia latifolia* spp. and *Gompholobium latifolium* sp. add gayer colours, but the most glorious colours come from the forest *Boronia* (*Boronia rosmarinifolia*) and the Wallum *Boronia* (*Boronia falcifolia*).

Prickly Moses (*Acacia Ulicifolia*), Dogwood [Mambu] (*Jacksonia scoparia*), Geebung [Wongul] (*Persoonia virgata*), Rice Flower (*Pimelia* spp.), Bush Iris (*Patersonia*

serviceae), Vanilla Lily (*Sowerbea juncea*), Golden Everlasting Daisies (*Helichrysum*), *Leucopogon*, Christmas Bells, Heath (*Epacris pulchella* spp.) are relatively common.

Orchid Beach is named after the beautiful Hyacinth Orchid (*Dipodium punctatum*), which grows in the shaded forest litter. There are a variety of other wildflowers, vine and plants too numerous to mention. Bloodwood [Bunar] (*Corymbia intermedia*) has, as its main characteristic, a scaly, steel-grey crocodile skin bark. Neither Scribbly Gum nor Bloodwood have commercial value on Fraser Island. Neither does the Moreton Bay Ash [Kurandhur] (*Corymbia tessellaris*) which grows there.

The best time to view most of the wildflowers is usually in early August, with the full season extending from mid-July to mid-September.

Refugia: The fact that Fraser Island has so many primitive plants indicates that it has been a refugia area for many millennia. It has allowed refuge for many species which have disappeared elsewhere as a result of climate changes. *Syncarpia hillii* is a very primitive member of the Myrtaceae family from which many species including Eucalypts evolved. There are also large numbers of the Araucariaceae family (Hoop and Kauri pines) which evolved while Australia was still a part of Gondwana. The presence of King Ferns (*Angiopteris evecta*) which once had global distribution and are recognized in fossils in coal seams dating back 350 million years and the large number of cycads also testify to the fact that Fraser Island is an area vital to present and future biodiversity.

Forestry Operations: This was very productive forest during logging operations that commenced in 1863. For a brief period between 1918 and 1925, Hector McKenzie & Co operated a sawmill on Fraser Island at North White Cliffs but for the most of the 128 year history of logging, all of the timber taken from Fraser Island was milled on the mainland.

Fraser Island timber was loaded from punting points between Moon Point and Fig Tree, and taken by barge up the Mary River to be processed into saw logs by Maryborough's two largest sawmills. In the 1980s one logging contractor (Andrew Postans) handled the total harvest from Fraser Island while the Forestry Department maintained a very small workforce (rarely exceeding 20 men) on Fraser Island.

As a result of recommendations of the Fitzgerald Inquiry into Fraser Island and the Great Sandy Region in 1990-91 Fraser Island was recommended for World Heritage Listing. Logging ended in December, 1991.

This is another FIDO Backgrounder to help explain Fraser Island and issues of its management.

