

# Fraser Island

## as described in the Australian Heritage Database

Declared a World Heritage property: 14/12/1992

### Statement of Significance:

The island is a place of exceptional beauty, with its long uninterrupted white beaches flanked by strikingly coloured sand cliffs, its majestic tall rainforests and numerous freshwater lakes of crystal clear waters.

The massive sand deposits that make up the island are a continuous record of climatic and sea level changes over the past 700 000 years.

Fraser Island features complex dune systems that are still evolving, and an array of dune lakes that is exceptional in its number, diversity and age.

The highest dunes on the island reach up to 240 metres above sea level. Forty perched dune lakes, half the number of such lakes in the world, can be found on the island. These lakes are formed when organic matter, such as leaves, bark and dead plants, gradually build up and harden in depressions created by the wind.

The island also has several barrage lakes, formed when moving sand dunes block a watercourse, and 'window' lakes, formed when a depression exposes part of the regional water table.

A surprising variety of vegetation types grow on the island, ranging from coastal heath to subtropical rainforests. It is the only place in the world where tall rainforests are found growing on sand dunes at elevations of over 200 metres.

The low 'wallum' heaths on the island are of particular evolutionary and ecological significance, providing magnificent wildflower displays in spring and summer.

Birds are the most abundant form of animal life on the island with over 350 species being recorded. It is a particularly important site for migratory wading birds which use the area as a resting place during their long flights between southern Australia and their breeding grounds in Siberia.

A species of particular interest is the endangered ground parrot, which is found in the wallum heathlands.

Few mammal species are present on the island. The most common are bats, particularly flying foxes. The dingo population on the island is regarded as the most pure strain of dingoes remaining in eastern Australia.

The lakes on Fraser Island are poor habitats for fish and other aquatic species because of the purity, acidity and low nutrient levels of the water. Some frog species are adapted to survive in this difficult environment. Appropriately called 'acid frogs', they tolerate the acidic condition characteristic of the Fraser Island lakes and swamps

Called K'gari by its Aboriginal inhabitants, the island reveals Aboriginal occupation of at least 5 000 years, although it is possible that further archaeological work may indicate earlier occupation. Early European reports suggested that Fraser Island was heavily populated by Aboriginal people, but subsequent research indicates that

there was a small permanent population of 400-600 that swelled seasonally to perhaps 2000-3000 in the winter months when seafood resources were particularly abundant. Fraser Island contains many sites of archaeological, social and spiritual significance. Middens, artefact scatters, fish traps, scarred trees and campsites bear witness to the lives of the original inhabitants.

European contact, initiated by Matthew Flinders in 1802, was sporadic and limited to explorers, escaped convicts and shipwreck survivors.

In 1836 a number of survivors of the wrecked ship 'Stirling Castle' lived for about six weeks on the island before being rescued. During these six weeks, hostility and aggression developed between the Europeans and the Aborigines. One of the survivors was the wife of the captain of the Stirling Castle, Eliza Fraser, after whom Europeans named the island. Day-to-day management of the island is primarily the responsibility of the Queensland Parks and Wildlife Service.

### DESCRIPTION

The region largely reflects Quaternary geomorphological processes along a fluctuating coastline, influenced by earlier geological history and the continental shelf. Fraser Island, 122km long and 5-25km wide is claimed to be the biggest sand island in the world. The sandmass is the major geological element, with the sand extending 30-60m below present sea level. The area represents a complete sequence of sand dunes, extending from the Holocene interglacial period (less than 10,000 BP) to before the last Pleistocene interglacial period (120,000-140,000 BP). The sand derives from granites, sandstones and metamorphic rocks in river catchments to the south and from the seafloor. Fossiliferous Lower Cretaceous marine charts are exposed in the intertidal zone on the west of Fraser Island (DASET, 1991).

The hydrology of the sandmasses is of considerable interest and importance due to the unique strata and the almost unaltered catchments of the region. Notable features are the sandmass aquifers and the dune lakes. The aquifers consist of an extensive regional freshwater 'lens' within each porous sandmass and perched aquifers associated with more or less impervious organically bound sands. Groundwater on Fraser Island is stored in massive reserves (estimated to be around 10-20 million megalitres) within the sandmass, of which almost 6 million megalitres is above sea level. A further 400,000 megalitres may be retained in the perched aquifers. Water may be stored for up to 70-100 years. The 40 perched, window and barrage dune lakes are unusual in the world, due to their number, size, elevation, depth and oligotrophic waters. The perched lakes on the island comprise more than half the known perched lakes in the world. Some of the perched lakes, formed in wind scoured depressions that later become impermeable due to collection of organic matter, are estimated to be up to 300,000 years old, and contain in their organic sediments a continuous record of changes to the island's hydrology and vegetation through Quaternary glacial and interglacial cycles. Window lakes form in low

elevation dune depressions that intersect the Island's regional water table. Barrage lake are thought to originate from groundwater springs, dammed by a wall of landward migrating sand (DASET, 1991; Sinclair and Morrison, 1990).

## CLIMATE

Conditions are maritime subtropical with mean annual temperatures ranging from 14.1° C minimum to 28.8° C maximum. Rainfall is high, reaching 1,800mm on the highest dunes in the centre of Fraser Island (DASET, 1991; Sinclair and Morrison, 1990).

## VEGETATION

Comprises seven main vegetation types: closed forest including rain forest and tall eucalypt forest dominated by satinay and brushwood; blackbutt forest; scribbly gum and wallum banksia communities; communities of wet sites often dominated by *Melaleuca* spp.; coastal communities; Callitris forest and woodlands; and mangrove and saltmarsh (Queensland Government, 1990a). There is clear zonation and succession of plant communities according to salinity, water table, age and nutrient status of dune sands, exposure and frequency of fires, creating a generally east-west sequence of vegetation (Sinclair and Morrison, 1990).

The rain forest is characterised by upper strata species such as piccabeen palm *Archontophoenix cunninghamiana*, hoop pine *Araucaria cunninghamii*, kauri pine *Agathis robusta* and carrol *Backhousia myrtifolia*. This community covers about 3,260ha of the island with approximately 25% currently represented in the national park. The tall eucalypt forests, dominated by pure stands of blackbutt *Eucalyptus pilularis*, occur mainly on the high dunes adjoining the rain forests. The low sclerophyll forest, behind the foredunes stretching back to the taller eucalypt forest, is dominated by scribbly gum *Eucalyptus signata* (Sinclair and Morrison, 1990).

The boundary of the region is given as 500m below high water mark, in order to include important areas of beaches, wetlands and mangroves, and part of the extensive seagrass beds in the Great Sandy Strait, which extend to more than 12,500ha (DASET, 1991; Sinclair and Morrison, 1990; A. Turner, pers.comm., 1992). The region is particularly important for relict populations of fern species, with around 50 species (including varieties) found on Fraser Island. A species list is given in Twyford (n.d.).

Internationally threatened species include stinking cryptocarya *Cryptocarya foetida* (V), *Acacia baueri baueri* (V), *Archidendron lovelliae* (V), *Phaius tancervilleae* (E), and *Macrozamia pauli-guilielmi* (E) (Twyford, n.d.).

## FAUNA

The native plant communities support a significantly diverse fauna, due to the variety and specialisation of a large number of habitats, although diversity within habitats is low. Few species are endemic to the sandy coastal heath areas (DASET, 1991; Sinclair and Morrison, 1990).

The island is noted for its low number and abundance of introduced species, presence of false water-rat *Xeromys myoides* (VU) (Twyford and Hobson, 1996) and high genetic purity of dingo *Canis lupus dingo* relative to other areas in eastern Australia (Woodall et al. in press). Over 300 bird species have been recorded including red

goshawk *Erythrotriochis radiatus* (EN), black breasted button quail *Turnix melanogaster* (EN), beach stone curlew *Esacus neglectus* and ground parrot *Pezoporus wallicus* (Twyford and Hobson, 1996).

Fraser Island is rich in reptile fauna and harbors a large number of specialised sand dwelling reduced limb skinks including a possible new genus, tentatively known as the Fraser Island Skink. Populations of acid frogs such as Wallum froglet *Crinia tinnula*, Cooloola sedgefrog *Litoria cooloolensis*, Wallum rocketfrog *L. freycineti* and Wallum sedgefrog *L. olongburensis* occur, as do breeding colonies of loggerhead turtle *Caretta caretta* (EN) and green turtle *Chelonia mydas* (EN). The island has nationally important populations of fish honey blue-eye *Pseudomugil mellis* (EN) and Oxleyan pygmy perch *Nannoperca oxleyana* (EN) (Twyford and Hobson, 1996).

## HISTORY

Aboriginal people are thought to have first occupied the region about 40,000 years ago. The earliest date for the occupation of Fraser Island is currently 1,500-2,000 years, although it is possible that further archaeological work may reveal evidence of earlier occupation. Four main groups of Aborigines dominated the Great Sandy region before the arrival of Europeans. Visible remains of Aboriginal settlement include middens, canoe and gonyah trees, and a few other markings such as scars where bees nests have been removed. Although examination of the archaeological potential of the region has been restricted, a number of sites have been located, particularly adjacent to the eastern shore. Over 200 shell middens have been found on Fraser Island (Sinclair and Morrison, 1990). Further information as to the significance Aboriginal people place on Fraser Island is available in Foley (1992), Free et al. (1994), and McNiven (1993a, 1993b, 1994a and 1994b).

## LOCATION

About 182 000ha, on the south-eastern coast of Queensland, comprising the whole of Fraser Island plus a 500 metre buffer seaward extending from the High Water Mark. Also included are a number of small islands off the west coast including Stewart Island, Dream Island, and small un-named islands between Dream Island and the mouth of Yankee Jack Creek, and including Boonlye Point. The boundary on these smaller islands also includes a 500 metre buffer seaward extending from the High Water Mark.