

World Heritage Sites

Protected Areas and World Heritage



FRASER ISLAND AUSTRALIA

Fraser Island lies just off the east coast of Australia. It is the largest sand island in the world, 122 km long, with majestic remnants of tall rainforest growing on sand and half the world's perched freshwater dune lakes. The combination of subtropical rainforests and lakes, shifting sand-dunes and 250 kilometres of white sand beaches, makes it an exceptional site.

COUNTRY

Australia

NAME

Fraser Island

NATURAL WORLD HERITAGE SITE

1992: Inscribed on the World Heritage List under Natural Criteria vii, viii and ix.

STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]

INTERNATIONAL DESIGNATION

1999: The adjoining Great Sandy Strait designated a Wetland of International Importance under the Ramsar Convention (93,160 ha).

IUCN MANAGEMENT CATEGORY

II National Park

BIOGEOGRAPHICAL PROVINCE

Queensland Coastal (6.1.1)

GEOGRAPHICAL LOCATION

The 122 km-long site comprises the whole of Fraser Island (Great Sandy Island), off the southeastern coast of Queensland 180 km north of Brisbane. It lies 5-10 km from the mainland across Great Sandy Strait and 10-65 km across Hervey Bay. Its boundaries follow a line 500m below high water mark. Located between 24°35' to 26°20'S and 152°45' to 153°30'E.

DATES AND HISTORY OF ESTABLISHMENT

1860-1906: Fraser Island gazetted an Aboriginal reserve, largely revoked in 1863 following the discovery of valuable stands of timber;

1908: The centre of Fraser Island declared a forestry reserve; by 1925 much of the island was a state forest (86,400 ha);

1971: Great Sandy National Park first established (94,900 ha),

1983: Fraser Island Fish Habitat Area (7,904 ha) established;

2000: The Great Sandy Regional Area established (220,000 ha), including Fraser Island.

LAND TENURE

The government of Australia, the state of Queensland and a small area in private ownership. Managed by the Queensland Parks & Wildlife Service (QPWS) of the state Environmental Protection Agency.

AREA

166,283ha. It is part of and adjoined on the west and south by the Great Sandy Region which includes Great Sandy National Park and Great Sandy Strait with Hervey Bay, totalling some 860,000 ha: 256,000 ha terrestrial, 604,000 ha marine.

ALTITUDE

Sea-level to 240m.

PHYSICAL FEATURES

Fraser Island stretches along the southern coast of Queensland, separated from it for some 60 km by the narrow Great Sandy Strait which opens into the wide Hervey Bay. At 122 km long, 7-25 km wide and 184 000 hectares in area, it is the largest sand island in the world and is protected as an outstanding example of ongoing geological and ecological processes. Its striking natural phenomena include long white beaches of great beauty flanked by strikingly coloured sand cliffs, majestic rainforests, forty perched dune lakes of crystal clear water and a complex still active system of massive dunes which reach 240 metres above sea level and extend 30-60m below it. The island is the result of Quaternary deposition of sand swept north from the continental shelf, and of continual erosion along a fluctuating coastline. It is a continuation of the similar Cooloola sand-mass on the mainland to the south. The Fraser Island sand-mass comprises a complete sequence of sand dunes extending from the Holocene less than 10,000 years ago, to before the last Pleistocene interglacial period, 120,000-140,000 years ago, forming a continuous record of climatic and sea level changes, past soil development and vegetational successions. Igneous rocks outcrop at Indian Head and Waddy Point in the north. Episodes of major dune-building have formed at least eight overlapping dune systems, some more than 700,000 years old, the world's oldest recorded dune sequence (QPWS, 2006). The sand, often tinted by iron-rich minerals, derives from granites, sandstones and metamorphic rocks in river catchments to the south and from the seafloor. There are 250 kilometres of white sand beaches. The soils are largely infertile except under the closed rainforest (DASET, 1991).

The hydrology of the sand-masses is notable for their unique strata and the almost unaltered catchments of the region, the sand-mass aquifers and dune lakes. The aquifers consist of an extensive regional freshwater lens within the sand-mass and aquifers perched over more or less impervious organically bound sands. The massive groundwater reserves, which may be stored for up to 70-100 years, are estimated at around 10-20 million megalitres within the sand-mass, of which almost six million megalitres are above sea level. A further 400,000 megalitres may be retained in perched aquifers. Over 100 lakes are scattered among the dunes. The 40 perched, window and barrage dune lakes are unusual in their number, size, elevation, depth and acidic oligotrophic waters, and comprise more than half the world total of such lakes. Some of them, formed in wind-scoured depressions that become impermeable from the collection of wind-hardened organic debris, 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 when a scoured depression exposes part of the regional water table. The island also has several barrage lakes formed when a wall of landward migrating sand dunes has blocked a watercourse or groundwater springs. Lake Boomanjin (200ha) which has tannin-brown water, is the world's largest perched lake and one of the highest (DASET, 1991; Sinclair & 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 the island (DASET, 1991; Sinclair & Morrison, 1990).

VEGETATION

The island has a surprising variety of vegetation ranging from coastal heath to subtropical rainforest, and is the only place in the world where tall rainforests grow on sand dunes over 200 metres in elevation. There are four main vegetation types. The most extensive is the scribbly gum *Eucalyptus signata* - *Banksia wallum* heathland; then coastal forest, heath and scrub communities; tall eucalypt forest dominated by stringy-barked satinay *Syncarpia hillii* and brush box *Lophostemon confertus*; and tall closed forest including rainforest and blackbutt *Eucalyptus pilularis* forest;. Four lesser communities are: cypress pine *Callitris glaucophylla* forest and woodlands; fens, wet forest and swamp communities often dominated by paperbarks *Melaleuca* spp.; mangrove and saltmarsh (Queensland Government, 1990). There is a clear generally east-west zonation and succession of plant communities according to the salinity, water table, age and nutrient status of dune sands, and the exposure, frequency and

intensity of fires (Sinclair & Morrison, 1990): the oldest dunes lie in the west, partly overlaid to the east by progressively younger dunes. In the heavily leached old dunes the forests are replaced by stunted woodlands, shrubs and low heaths by a process of retrogressive succession which is of considerable scientific interest.

The slopes and valleys of the high central dunes are the best protected from winds, receive the highest rainfall and have the deepest soils. Sheltered from the sea winds by the outer vegetation they are dominated by the rainforest community, which covers about 3,260 ha. Characteristic upper strata species are the huge brush box, piccabeen palm *Archontophoenix cunninghamiana*, the Gondwanan species hoop pine *Araucaria cunninghamii* and kauri pine *Agathis robusta* intermixed with low vine forests of small-leaved grey myrtle or carrol *Backhousia myrtifolia*. The tall eucalypt forests are dominated by pure stands of blackbutt, and grow mainly on the high dunes adjoining the rain forests. The low sclerophyll forest, between the foredunes and the tall eucalypt forest, is dominated by scribbly gum (Sinclair & Morrison, 1990). The low wallum heaths are of evolutionary and ecological significance and provide magnificent wildflower displays in spring and summer. Small hardy trees such as beach she-oak *Casuarina equisetifolia*, coastal banksia *Banksia integrifolia* and screwpine *Pandanus tectorius* stabilise the foredunes and protect the inland vegetation from the harsh salt-laden winds.

The region is particularly important for relict populations of fern species, with around 50 species and varieties found on the island. Threatened species include pineapple zamia *Macrozamia pauli-guillielmi* (EN), little wattle *Acacia baueri baueri*, baconwood *Archidendron lovelliae* and the orchid *Phaius tancervilleae* (Twyford, n.d.). Internationally threatened species include Key's boronia *Boronia keysii*, stinking cryptocarya *Cryptocarya foetida*, bogrush *Schoenus scabripes*, and Fraser Island creeper *Tecomanthe hillii* (Sinclair & Morrison, 1990). The boundary of the region is 500m below the high water mark to include important areas of beach, wetland, mangrove, and part of the more than 16,300 ha of seagrass beds in the nutrient-rich Great Sandy Strait and Hervey Bay (DASET, 1991; Sinclair & Morrison, 1990). Full checklists of the flora and fauna are given in the nomination document (DASET, 1991).

FAUNA

Compared with the mainland the island is noted for its low number and incidence of introduced species. The native plant communities contain a large number of specialised habitats that support a very diverse fauna, although diversity within habitats is low and few species are endemic to the sandy coastal heaths (DASET, 1991; Sinclair & Morrison, 1990). 66 mammal species, 17 amphibian, 78 reptile and 352 bird species are noted in the latest QPWS checklists (2003 and 2005). The mammals include 12 marsupials, including the sugar glider *Petaurus breviceps*, 19 bats including the regionally endemic grey-headed flying fox *Pteropus poliocephalus* (VU), 11 rodents including the water mouse *Xeromys myoides* (VU), and a population of dingo *Canis lupus dingo* which is the purest genetic strain remaining in eastern Australia (Twyford & Hobson, 1996).

The seagrass beds of Hervey Bay and Great Sandy Strait support a large but declining population of dugong *Dugong dugon* (VU). The marine mammal fauna also includes the New Zealand fur seal *Arctocephalus forsteri*, ten dolphins and eight whales: southern right whale *Eubalaena australis*, dwarf minke whale *Balaenoptera acutorostrata bonaerensis*, Bryde's whale *Balaenoptera edeni*, humpback whale *Megaptera novaeangliae* (200 have been counted) sperm whale *Physeter macrocephalus* (VU), pygmy sperm whale *Koiga breviceps*, strap-toothed whale *Mesoplodon layardii* and Blainville's beaked whale *Mesoplodon densirostris*.

The lakes and swamps are poor habitats for fish and other aquatic species because of the purity, high acidity and low nutrient levels of the water but the island has nationally important populations of the honey blue-eye *Pseudomugil mellis* (EN) and Oxleyan pygmy perch *Nannoperca oxleyana* (EN) (Twyford & Hobson, 1996) and the Park has most of the world's known habitat for 'acid frogs' which have adapted to the difficult conditions. Populations include Cooloola sedgefrog *Litoria cooloolensis* (EN), wallum rocketfrog *L. freycineti* (VU), wallum sedgefrog *L. olongburensis* (VU) and wallum froglet *Crinia tinnula*. The poisonous introduced cane toad *Bufo marinus* is seen as a dangerous threat. The island is rich in reptile fauna and harbours 23 species of sand-dwelling reduced-limb skinks including a monotypic genus the sand-swimmer *Coggeria naufragus*. There are breeding colonies of loggerhead turtle *Caretta caretta* (EN) and green turtle *Chelonia mydas* (EN); visiting turtle species include hawksbill *Eretmochelys imbricata* (CR), leatherback *Dermochelys coriacea* (CR) and olive ridley turtles *Lepidochelys olivacea* (VU). Coral reefs occur within Great Sandy Strait and offshore (Sinclair & Morrison, 1990). 300 insect species have been identified.

Birds are the most abundant animals on the island with 352 species recorded. It is a particularly important site for migratory waders which use the area as a stop-off during their long flights between southern Australia and their Siberian breeding grounds. Other species include the mound-nesting Australian brush-turkey *Alectura lathamii*, red goshawk *Erythrotriorchis radiatus* (VU), black-breasted button quail *Turnix melanogaster* (VU), beach stone-curlew *Esacus neglectus*, ground parrot *Pezoporus wallicus*, found in the wallum heathlands, Australian king parrot *Alisterus scapularis*, yellow-tailed black cockatoo *Calyptorhynchus funereus* and sulphur-crested cockatoo *Cacatua galerita*. Less common seabirds are soft-plumaged and Providence petrels *Pterodroma mollis* (VU) and *P. solandri* (VU), southern giant petrel *Macronectes giganteus*, grey-headed albatross *Thalassarche chrysostoma* (VU), sooty albatross *Phoebastria fusca* (EN) and wandering albatross *Diomedea exulans* (VU).

CONSERVATION VALUE

Fraser Island is the largest sand island in the world and an outstanding example of ongoing sand-mass related geological and ecological processes. The combination of the globally unique rain forests growing on tall sand dunes and the array of dune lakes is exceptional (DASET, 1991). The Park lies within a WWF Global 200 Freshwater Eco-region, and is a BirdLife-designated Endemic Bird Area. It adjoins a Ramsar wetland which is a refuge for humpback whales and dugongs.

CULTURAL HERITAGE

The island reveals Aboriginal occupation of at least 5,000 years, although further research may indicate earlier occupation. It was called K'gari by its Aboriginal inhabitants. Five main related groups of Aborigines dominated the Great Sandy region before the arrival of Europeans, of which the Butchulla people remain. There was a small permanent population of 400-600 that swelled seasonally to perhaps 2,000-3,000 in the winter when seafood resources were particularly abundant and bark for canoes and shelters, vines for nets, and piccabeen palm fronds for baskets were collected. Some 450-500 sites have been located, particularly adjacent to the eastern shore. The island contains many sites of spiritual, archaeological and social significance: canoe and gunyah trees, tree scars, artefact scatters, fish traps, campsites and over 200 shell middens.

The first written record of the region is from Cook's discovery of the east coast in 1770. European contact, initiated by Matthew Flinders in 1802, was sporadic and limited to explorers, escaped convicts and shipwreck survivors. In 1836 survivors of the wrecked *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 ship's captain, Eliza Fraser, after whom Europeans named the island. In 1842, good pastoral lands and excellent forests were reported which attracted settlers who grazed horses, sheep and cattle on the island.

Aboriginal life was disrupted soon after European settlement. Dispossession of their land and reduced access to native plants and animals caused disruption of beliefs and practices, and disease, alcohol and opium destroyed their traditional way of life. Land clearance for pasture and timber harvesting from 1863 hastened the end. An Aboriginal mission was established at White Cliffs between 1870-73 and an Aboriginal Reserve was established at more remote Bogimbah Creek, in 1897, operating as a mission and virtual prison until 1904 when the surviving Aboriginal inhabitants were dispersed to various mainland missions (Twyford, 1995). Further information on Aboriginal people on the island is given in Foley (1992), Free *et al.* (1994), and McNiven (1993a, 1993b, 1994a and 1994b). The works of Patrick White and Sydney Nolan have etched awareness of the island into the national consciousness.

LOCAL HUMAN POPULATION

There are only some 116 residents on the island. Eight small resort settlements, as well as camping areas, forestry camps, roads, jetties, and airstrips lie within the nominated area. Similar developments border the area to the south and west. There are proposals for further development both within and next to the nominated area.

VISITORS AND VISITOR FACILITIES

Tourism grew slowly until the 1930s. Controversy over sand mining in the 1970s and the cessation of logging in the early 1990s, dramatically increased visitor interest. During 1993-1994, approximately 82,000 camper nights were recorded on the island (M. Hocking, pers. comm., 1997). In 2001-2 Fraser Island had almost 320,000 visitors. Visitor facilities now include resort hotels as well as accommodation for 8-10,000 in seven developed camp sites as well as beach camping zones, walkers' camps and fishing camps, all heavily used at peak times. Awareness of the potential of danger from wild dingos is

necessary. There is a network of 44 km of gravel roads and approximately 1,000 km of unsealed sand tracks established originally for forestry purposes; four-wheel-drive is necessary (DASET, 1991). Access from the mainland is by launch, barge and air from across the bay.

SCIENTIFIC RESEARCH AND FACILITIES

The Great Sandy Region Scientific Advisory Committee was established in 1992, meets periodically and has drawn up an agenda for research. Inventories of the mammals, reptiles, amphibians and birds were taken during 2003-2005 by the Wildlife Service; and chronosequencing of the dunes and examination of retrogressive succession remain intriguing subjects of research. The Wildlife Service currently runs monitoring programs on plants, small mammals, birds and dingoes. Previous research undertaken on Fraser Island is referenced in the bibliographies in the Commission of Inquiry reports (1990) and DASETT (1991). A comprehensive bibliographic review for the island is available from the Department of Natural and Rural Systems Management, University of Queensland, Australia (M. Hockings, pers. comm., 1997).

MANAGEMENT

Management of the World Heritage Area is by the Queensland Parks and Wildlife Service principally through the provisions of the Nature Conservation Act 1992 and the Recreation Areas Management Act of 1988 and 1991. Management is overseen by a Ministerial Council, comprising Federal and Queensland Government Ministers and a Management Committee consisting of the Chief Executive Officers of the Federal and State Environment Departments, the Queensland Department of Natural Resources, the Office of National Tourism, the Mayors of the two local authorities and, ex officio, the Community and Scientific Advisory Committees (M. Hockings, pers. comm., 1997). In 1994 the fifteen-year Great Sandy Regional Management Plan was prepared by the Queensland Government to provide an integrated planning framework for the whole of the Great Sandy Region, of which Fraser Island is a part. This specified that subject to the resolution of Aboriginal land interests, vacant Crown land on southern Fraser Island was to be added to the existing National Park within the provisions of the Nature Conservation Act, 1992 (Queensland). Aboriginal land claims on Fraser Island may only proceed under the provisions of the Native Title Act 1993. Under the Aboriginal Land Act 1991 (Queensland), land designated as National Park may be listed as claimable by the Government. The Fraser Island Section of Great Sandy National Park is not presently listed as claimable. A management plan was to be developed for an Aboriginal management area, should a successful claim be made under the Queensland Aboriginal Land Act. A Camping Management Plan and a Dingo Management Strategy have been drawn up by QPWS.

The forests of the region were logged between 1863 and 1991 when logging was the region's major industry. Many large old trees were removed, especially Kauri pine and blackbutt, altering the forest structure, floristic composition and relative species abundance (DASET, 1991; Sinclair & Morrison, 1990). In the absence of fire-management, long term maintenance of the blackbutt forests is necessary to halt their conversion to closed forest communities (M. Hockings, pers. comm., 1997). Small scale mining for sand and valuable heavy minerals (rutile and zircon) was licensed between 1949 and 1976: 350 ha for sand and 150ha for mining in the south-east of the island was removed, and the topography irreversibly simplified. Opposition from conservationists and community groups finally secured the removal of sand mining in 1976 (DASET, 1991; Sinclair & Morrison, 1990).

MANAGEMENT CONSTRAINTS

Threats to the island's ecosystems exist but are minimal and controllable: invasion by alien weeds, feral animals and pathogens and the potential for the harmful impacts of fire and by excessive recreational use and vehicular access which are not well realised by visitors.

Alien introductions: The relatively few introduced species include extensive infestations of groundsel *Baccharis halimolia* and lantana *Lantana camara*. Species such as boneseed *Chrysanthemoides monilifera rotundata*, sisal hemp *Agave sisalana*, and Easter cassia *Senna pendula glabrata* are significant local problems. The poisonous cane toad is widespread but other feral animals are found in low numbers. The killing of a child in 2001 by dingoes prompted culling and stricter regulations on interaction with them. The impacts of recreational use and vehicular access are already under active management to ensure resource conservation (DASET, 1991; Hockings & Twyford, 1997). Many forestry tracks remain and there is a continuing serious problem with the control of four-wheel-drive traffic (IUCN, *in litt.*, 1996). Pollution: There is contamination of the freshwater lens beneath the island due to the spread of human pathogens. Eutrophication has appeared in Ocean Lake and Lake Wobby. Water quality monitoring is therefore being undertaken as part of a broader monitoring programme

(Hocking, n.d.). There have also been major die backs of seagrass beds in Hervey Bay due to flooding and siltation. Dugongs have become very scarce. Sewage and pesticide pollution is a growing management problem in the Kingfisher Bay area (IUCN, pers. comm., 1996).

STAFF

In 2002 63 staff and 12 volunteers are employed by the Queensland Parks and Wildlife Service working on natural and cultural resource management, public contact, recreation management, infrastructure maintenance and development, enforcement, emergency response, waste removal, road management and administration. Field staff receive extensive training and are supported by policy, planning and administrative staff located in Maryborough (EA/QPWS, 2003).

BUDGET

Funding is mainly through the Recreation Areas Management Act and increased from US\$1.47 million in 1992-3 to US\$4.1million in 2001-2002. Revenue from entry and camping fees, service permits and fines contribute to park maintenance (EA/QPWS, 2003).

LOCAL ADDRESSES

Queensland Parks and Wildlife Service, PO Box 101, Maryborough QLD 1123, Australia.

Department of Natural and Rural Systems Management, University of Queensland, QLD

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