

# Determining Fraser Island's "Integrity"

*The World Heritage Convention obliges the national Australian government to preserve the integrity of all of its World Heritage properties. The Commonwealth undertook to protect Fraser Island's integrity when its nomination went forward in 1991 and the Great Sandy Region Management Plan envisages trying to establish the pre-industrial landscape as the benchmark for Fraser Island's integrity.*

*This backgrounder is based on a paper delivered at the 2006 "True Grit" conference on Fraser Island.*

**A National Obligation:** The World Heritage Convention obliges the Australian Government to maintain Fraser Island's integrity. It needs to identify unacceptable changes and address the causes of those changes. Since the Commonwealth Government has agreed that the Queensland Government should have responsibility for day-to-day management, maintaining Fraser Island's integrity is a shared Federal-State responsibility.

**Maximum Biodiversity:** Biodiversity is one of the most crucial measures determining integrity. Fraser Island's maximum natural biodiversity probably existed around 1800, prior to the advent of industrial society to its shores. Its environment to 1800 would have been shaped by thousands of years of climate change during the Holocene period and at least 5,500 years of Aboriginal occupation that influenced the composition and balance of the island's biota and landscape. Since then there have been many unnatural interventions.

Most of the changes to Fraser Island's integrity are reflected in its ecosystems. Therefore it is vital to review all past observations and photographic records and to constantly monitor the situation on Fraser Island to assess if the integrity is being maintained.

**The Big Four:** The four most significant changes to the island's integrity have resulted from

1. introductions of alien flora and fauna;
2. changes away from the Aboriginal fire regime;
3. industrial extraction of resources; and
4. climate change.

## 1. Introductions

All introduced plants and feral animals such as cane toads are unnatural and inconsistent with integrity. Any introductions compete with the pre-existing fauna and flora. Since the 1850s, introduced plants have added to Fraser Island's biodiversity as more weeds species are added to its plant list. However many of these weeds are displacing and out competing the original plants and changing the plant communities. Weeds are also impacting on the fire regime. On the positive side though most of the weeds that are garden escapees are confined to the human settlements. The older the settlement, the more weeds may be found. That is why Sandy Cape Lighthouse, Bogimbah, Happy Valley and Eurong are epicenters of the worst weed infestations but more recent settlements at Orchid Beach, Dilli Village and Kingfisher Resort have all brought some new pernicious introductions. Some of Fraser Island's worst weeds though arrived with birds and not in pots or nursery stock. These include groundsel which has been out of control along the western side of the island and lantana which has been thickest nearer the east coast. The good news is that lantana is now retreating very significantly due to biological control. Biological agents are also containing cactus and may help eventually with groundsel. Despite being invaded by some feral ants, earthworms, mice and rats, most of the island remains relatively free of pests, especially the pandanus leafhopper, *Jamella australiae*.

**Fauna:** Cane toads (*Bufo marinus*) were self-introduced sometime in the last half century. Their appearance and the disappearance of the quolls from Fraser Island escaped any documentation. They are also obviously impacting on death adders and possibly other reptiles. Fraser Island has so far escaped some of the feral pests that have had devastating impacts elsewhere such as pigs, foxes, rabbits and goats. It is worrying that some cats prowl the island and that there may be a pig but the removal of the brumbies in 2005 has helped restore the pandanus to the foredunes. This an issue first raised by Walter Petrie in 1922. Likewise the feral cattle were removed in the 1970s. Of great concern is the introduction of less conspicuous insects such as ants

**Disappearances:** While evidence of introductions including plants and animals which didn't exist before can be documented, it is harder to appreciate the disappearance of species which have been displaced. Extirpations (local extinctions) such as the quolls, are being attributed to the advent of cane toads, which may also be threatening other species such as death adders. Vast flocks of swans foraged in the seagrass beds that fringed the island up to the 1960s. Now swans are rarely seen near Fraser Island. Other significant environmental population changes have gone unreported. It is important to monitor any such changes.

## 2. Fire Regime

**Fire:** It is fair to say too much fire will inevitably reduce the island's biodiversity. However it is equally valid to point out that many plants and animals respond to fire and that too little burning will also result in a significant loss of biodiversity. The mutually agreed aim of most fire ecologists is to replicate as closely as possible the Aboriginal fire regime.

Traditional Aborigines were masters of fire and skillfully used it to modify the environment. Aboriginal burning sought to:

- a. manipulate the environment to maximize the environmental productivity;
- b. facilitate hunting and gathering;
- c. assist pedestrian travel through country; and
- d. increase human safety.

In contrast, westernized Australians are generally scared of fires. Property protection is the major rationale for most deliberately lit "Management fires" as evidenced by the Queensland Parks and Wildlife Service burning program. In 2005 the 19 management burns totaling only 350 hectares were all aimed at property protection. At that rate it would take 500 years to burn the island just once. Nine out of the ten 2006 management burns were to protect property. Only one of 1383 hectares could be deemed an environmental burn. At that rate it will take over 100 years just to burn Fraser Island once unless catastrophic wild fires don't scorch it first. Fraser Island could be devastated unless the rate and process of management burns as outlined in the 2002 Fraser Island Fire Management Strategy is implemented with greater alacrity.

### 3. Industrial Extraction of Resources

The integrity of Fraser Island has been partially compromised by the lasting scars of two extractive industries — sandmining and logging.

**Sandmining:** The impact of sandmining between 1971 and 1976 affects not only the actual land which was mined but also the land affected by the infrastructure put in to carry out the mining operations and the land adjacent to the disturbed land. Some scars of sandmining will remain an everlasting legacy. The total destruction of the soil profile means that it may take centuries before an enduring developed soil profile is re-established and for natural plant communities to return. However, the topography of the disturbed land will never be re-established. Mercifully only about 200 of Fraser Island's 167,000 hectares were actually disturbed.

Fraser Island's integrity though may be further compromised by the introductions of new plant species that accompanied sandmining (which probably included beach spinifex and bitou bush). Recent inspections of the DM mine site show that the species composition of the forest now replacing the original vegetation has dramatically changed with blackbutt and ironbarks, which were virtually absent from the site before mining, now disproportionately represented amongst the sparse emergent trees. Apart from residual infrastructure such as the Hook Point to Dilli Village road, the Boomajin airstrip and Dilli Village itself, the biggest impact is the domino effect on the unmined areas in the lee of the sandmined sites particularly, the QTM site. Self-exacerbating dieback results from ever more exposure to scalding salt laden winds as windward vegetation retreats due to these winds.

**Timber Industry:** 128 years of timber extraction which ceased in December 1991 also left behind a significant infrastructure including the road network, logging dumps and settlements. However the changes to the botanical composition and the physical structure of the forest will take a few centuries to repair as many of the trees removed, the capital of the forest, were centuries old. The deliberate manipulations in such exercises euphemistically referred to as "blackbutt regeneration" or "holding back the rainforest" involved clear-felling of large coups and the establishment of even aged forest growing from a deliberately created seedbed. Selective logging removed only the larger trees of preferred species thus altering the botanical composition and balance of the forest that will take a long time yet to recover from. Another enduring impact has been the effect of the fire regime imposed which aimed to totally protect the commercial forests with little regard for the impact on the ecology of the island as a whole or on the non-commercial areas which were burnt without any consideration of the impact. Although it will take hundreds of years to replace trees to the size of the removed forest giants, the process has begun. At present rates of progress, it may also take that time to evolve an appropriate sustainable fire regime for the island.

**On the positive side** the cessation of sandmining in 1976 has preserved the integrity over the 99% of the island. Over time the 200 hectares that were mined may heal. When logging ceased in 1991, it allowed the tall forests to begin to regain their original structure but the process may take centuries. Fortunately there is also a greater community awareness and willingness to protect and restore Fraser's integrity.

### 4. Climate Change

Fraser Island isn't exempt from the implications of global climate change. Climate change impacts affect its geography as well as the biology. The island will shrink. Some species will be lost and others gained. The implications are so widespread and profound that this topic has warranted a separate background.

### 5. Other Integrity Threats

Two further issues threatening Fraser Island's integrity apart from the Big Four warrant discussion — tourism and urbanization.

**Tourist Industry:** The volume of Fraser Island tourism grew rapidly from 5,000 in 1970 to 350,000 visitors annually at the turn of the century. Fraser Island tourism industry is now contributing well above a quarter of a billion dollars annually to the Queensland economy. It has become a sort of sacred cow politically but its adverse environmental impacts need to be acknowledged and minimized.

The trampling of plants, the loss of habitat through roads and other infrastructure, pollution and the inevitable introductions of new species both intentionally and unintentionally are all extended by the increased number of Fraser Island visitors.

The most dramatic impact of tourism is to be seen on the down-cutting of all roads, particularly those used by heavy buses. The present transportation system is resulting in countless tones of sand being relocated downhill. Sand washing off some island roads and picnic areas is slowly filling lakes such as Lake McKenzie. There has been no study on the impact of road wash carried out on the island.

Some of the impacts of the tourist industry may have been avoided if appropriate decisions had been taken early enough. However once the damage has become a *faite accompli*, such as the dredging of the Wangoolba Creek barge canal through the Great Sandy Strait Fisheries Habitat Reserve, vigilance is required to ensure that the impacts do not become cancerous and continue to extend.

The current threats which tourism poses to Fraser Island's integrity are from the impact of the present transportation systems, from introducing and/or extending many injurious agencies around Fraser Island and from the ever growing demand for new services and commercial opportunities. Tourism facilitates the introduction and spread of all forms of injurious agents around Fraser Island. These include fire, pathogens, litter, weeds, diseases and feral fauna.

**Urbanization and Infrastructure:** It is inconceivable that there could be any industry, particularly the tourist industry, without even the most basic infrastructure — roads, rail lines, power lines, waste management facilities and, of course, human settlements which become part of the infrastructure. Although Fraser Island has fewer than 100 permanent residents, there are many more buildings that accommodate thousands at peak times. Although there is now a cap on the growth of the settlements, building activity still continues apace within them, particularly Orchid Beach. The footprints of the few urban centers, particularly Kingfisher Resort and Orchid Beach, seem to be ever expanding.

**Preserving the integrity of Fraser Island is a shared responsibility of Federal, State and local governments.**