The Carrying Capacity of Fraser Island

For the past decade the number of visitors to Fraser Island has been growing at a relatively consistent rate. By 2002 the number of visitors had reached about 350,000. This growth in visitor volume has been accompanied by an accelerating rate of degradation. The question now being increasingly asked is: what is the sustainable carrying capacity of Fraser Island. A series of studies on Fraser Island carried out by EDAW on site capacity and main transport routes has shown an alarming number of sites and routes being used beyond their capacity. The answers are both complicated and generally politically unpalatable.

The level of sustainability is dependent on the level of management and infrastructure. This is generally dependent on the budget provided for management.

Some Carrying Capacity Concepts

1 ***The impact per person diminishes marginally as the number of visitors increases.*** The first person to enter a pristine environment has about the same impact as the next nine people to follow there. The first ten people entering a pristine environment have about the same impact as the next 90 people following. The first 100 people entering a pristine environment have about the same impact as the next 900 people following. … The first 10,000 have about the same impact as the next 90,000.

2 ***The impact per person is conditional on the method of visitation.*** A visitor on horseback will have a greater environmental impact than a pedestrian because of the grazing habit of horses, the impact of their hooves and their capacity to spread weed. The impact of people in a 4WD will be greater than a vehicle elevated above the ground surface. All of these factors have now been irrefutably established.

3 ***The resistance of the ground surface to erosion is critical to carrying capacity***. Sandstone is harder than aeolian sand. Thus more than a million visitors to the Blue Mountains World Heritage site annually (excluding its 50,000 residents), have less impact than 350,000 visitors to Fraser Island. Apart from being based on more resilient sandstone, the New South Wales Government spends more than four times as much per hectare to manage its National Parks as does Queensland.

4 ***Environmental impacts on sand can be reduced if visitors don't come into direct contact with the surface.*** Pedestrians on a boardwalk have negligible impact compared with people walking on bare sand, but there is a cost to construct and maintain boardwalks. It was in recognition of this concept that FIDO built the first ever boardwalk on Fraser Island at Eli Creek. This concept is just as critical to FIDO's advocacy of a light rail people mover. The major impact of light rail would be confined to its construction and servicing. Light rail would be more fuel efficient and would minimize ground surface disturbance.

5 ***The weight to surface area ratio is very critical.*** Studies carried out by GH&D and QUT, both independent environmental consultants, on Fraser Island clearly established that impact of vehicles was significantly greater for vehicles with heavier axle loading. The heavier the vehicle, the greater the impact. A surprising finding by GH&D is that automatic transmission 4WDs had less impact than manual drive transmission. A maximum tyre pressure of 30 psi is recommended for ALL 4WD vehicles.

6 ***Impacts are reduced if all visitors follow the same path/route.*** Both boardwalks and light rail have added advantages in stopping the spread of impacts to a wider area. Because 4WDs wander, need clearance to allow for this as well as needing passing bays, they will affect the vegetation much more significantly.

7 ***The extent of impact per visitor is influenced by topography (slope and exposure to erosion) and the hardness of the ground surface.*** The impact of slope has been shown clearly by recent studies of roads by GH&D and QUT.

8 ***Camping has a much greater impact than permanent accommodation.*** This is similar to the concept that rails and boardwalks confine impacts. Around permanent accommodation there will be established means of waste disposal, including toilets. There will be water storage and supply. Access and potential points of degradation will be hardened. There will be stoves and barbecues to avoid the severe impacts of fire rings. There are many other reductions in impacts, including the amount of energy used in the building cartage and manufacture, the health issues, and the physical site issues. However, if the permanent accommodation is used to only a very limited extent, then carefully considered low-impact camping may have much lower impact.

The implication of these concepts is that the sustainable number of visitors to Fraser Island depends on the management applied. If a more sustainable form of visitation is established, the carrying capacity could be increased. This would need to be based on low impact transportation, better camping patterns and/or more use of low impact accommodation and more pedestrian boardwalks.

While Fraser Island is currently suffering significant degradation from unsustainable use in many critical parts, it is conceivable that the carrying capacity could be significantly increased to above 500,000 with changed patterns of visitation and recreation.

The carrying capacity ultimately depends on two critical factors: the resilience of the environment and the resources applied to visitor management. Because Fraser Island is low on both, more resources are required. The most critical factor in achieving sustainable management is securing more generous budgeting.

Fraser Island Visitation Trends

The long term trend in visitation to Fraser Island has been ever upward. Studies show that the growth in visitation to World Heritage sites is much greater than for other comparable natural sites. The growth in visitor numbers has not been matched by a budget to make the increased visitation sustainable. How long can this upward trend in visitation continue.

World Heritage Icons: A study recently undertaken for the Australian Heritage Commission by Ralf Buckley of Griffith University on the contribution of World Heritage branding to nature tourism, in a report titled "*World Heritage Icon Value*", showed that visitation to Fraser Island had increased from 160,000 to 320,000 between 1986 and 2000. In the same period, visitation to Moreton Island, with many comparable values, increased only from 50,000 to 75,000.

Kakadu visitation grew from 60,000 in 1984 to 200,000 in 2000, and Uluru visitation grew from 100,000 in 1984 to 380,000 in 2000. The Tasmanian Wilderness visitation grew from about 270,000 in 1982 to a little less than 500,000 in 2000. In each of these cases the growth in visitation greatly outstripped the growth in visitation to comparable control areas.

Given the continuing exponential growth and the demand for visitation to all World Heritage sites where visitor numbers are capable of doubling every 16 to 18 years, the question which has to be asked is: how long can this exponential growth continue and *"What is the carrying capacity of Fraser Island?"*

Peaks and Troughs: FIDO has attempted an analysis of the figures on a monthly basis to try to detect trends, but the results are baffling. There is no consistent monthly trend, except to note that heaviest visitation roughly coincides with school vacation periods, but numbers per month in the last four years have varied from a low of 16,113 to a peak of 39,186. Although in 2001-2002 the variation between months had levelled out significantly, with highest numbers being January and February (both almost 35,000) and the lowest May and June (just over 21,000).

Peaks and troughs are significant. If all \visitors arrived in a short period of time the impact could be unsustainable. Thus, it is very important to avoid too much variation and to ensure that the peaks do not exceed the carrying capacity.

Specific Sites: The concentration of visitors at particular sites also may mean that although the carrying capacity of Fraser Island is not being exceeded, the carrying capacity of a particular site may be exceeded. This is one of FIDO's main arguments about the staging of the Fishing Expo at Orchid Beach. It concentrates more visitors at that site than would normally be there. It means that the carrying capacity of the track from Middle Rocks to Orchid Beach and the camping sites around Orchid Beach have to be increased, just to accommodate this crowd for only one week in the year.

A study of various site capacities on Fraser Island was undertaken for the Queensland Environmental Protection Agency by independent environmental consultants, EDAW. They showed that there were extraordinary numbers drawn to three areas, Central Station (1380 per day) Lake McKenzie (1220 per day) and Eli Creek (1160 per day). This is despite the fact that people familiar with Fraser Island know that there are comparable areas in other parts of Fraser Island which could avoid this pressure. The problem is that, as long as people are focussed only on these sites, the island's carrying capacity is limited to the capacity of these sites.

Visitation to natural areas needs to be spread more evenly over both time and specific sites.

Increased numbers possible: As explained in some of the principles, it is possible to increase carrying capacity. That technique is now being employed to increase the carrying capacity at Eli Creek and Central Station. In both cases it will be achieved by raising the boardwalks to make them wider, enabling them to accommodate more people. This is being done at enormous cost at Eli Creek. There is no provision in the budget for managing Fraser Island in the foreseeable future to ever carry out the requisite capital works required to make visitation to Central Station sustainable.

Likewise, people could be accommodated on Fraser Island more sustainably than in the disorganized shambolic health hazard which exists at Indian Head. However governments will not provide the resources to build new camping areas.

Some Measures to Increase Carrying Capacity:

1. Lift the visitors above the ground to minimize disturbance of the sand surface. This can be done by:
   - boardwalks for pedestrians;
   - light rail people movers;
   - accommodation to replace some camping;
2. Harden some surfaces while recognizing the adverse impact of accelerated run-off from sealed surface.
3. Organized campgrounds to replace free range camping.

The Cost of Sustainability: All of these measures cost money, which isn't being provided in sufficient amounts by either the Queensland or Commonwealth Governments to fund this work at the pace it needs to be carried out. This is despite Fraser Island's contributing more than a quarter of a billion dollars annually to the national economy.

To continue the comparison with the other World Heritage areas: the Commonwealth Government provides Kakadu with $12 million, Tasmanian Wilderness $5 million and Fraser Island with not more than $700,000 in any year.

The Queensland Government is very evasive about how much it spends on Fraser Island annually. The budgets for spending on Fraser Island and are not published and are not available. However, it is known that all of the fees collected under the Recreation Areas Management Act is spent there. This is less than $4 million. It is known that this may be augmented by up to $1 million from consolidated revenue, but in some years the Beattie Government has contributed nothing more than what is collected under RAM fees. Money was found to establish a permanent police presence on the island.

The alternative to undertaking appropriate works to make visitor numbers sustainable is to place a cap on visitor numbers. This is already occurring in many National Parks in Queensland. Probably Queensland's best managed National Park, at Lawn Hill, strictly enforces a visitor cap by restricting the number of camp sites.

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