

Ecological Use of Fire on Fraser Island

FIDO's objective is to adopt a fire management regime which will achieve the best outcome for Fraser Island ecology and achieve greater biodiversity on Fraser Island. FIDO believes that the optimum biodiversity on Fraser Island will be achieved by replicating the Aboriginal patterns of fire management to maximize the biodiversity of Fraser Island. By straying from that pattern we are losing biodiversity

Aboriginal History of Fire Use

Aborigines arrived in Australia at least 40,000 years ago. They immediately introduced fire. There is abundant scientific evidence showing an increased frequency of fire following their arrival. There is also fossil evidence that the arrival of the Aborigines roughly coincided with the loss of the Australian mega-fauna including giant kangaroos, giant wombats and giant python. There is no conclusive evidence that Aborigines were responsible for the demise of the mega-fauna. However with the loss of such large herbivores, it would have been necessary to use fire to manage the vegetation which herbivores would have previously eaten or trampled. This is the rationale for the very early development of Aboriginal fire management. If a fire regime were not introduced many of the population would have been incinerated in the inevitable wild fires

After 40,000 to 60,000 years of Aboriginal burning the environment has adapted to the Aboriginal fire regime. It is FIDO's belief that the maximum biodiversity we can now expect to achieve on Fraser Island will only be achieved with the re-instatement of the Aboriginal fire regime. We believe that if this is not incorporated there will be a further loss of biodiversity.

Fire on Fraser Island

Fraser Island has been only an island for less than 10,000 years. It only became an island when the sea levels rose following the last great ice age when all of Hervey Bay would have been covered with forest and the coastline would have been beyond Breaksea Spit. It may have previously from time to time been isolated as an island. Aborigines would have had traditional lands now long submerged below the sea. Fraser Island which has been a dune system for more than 800,000 years would have been a vast high sand ridge well inland but with many of the features it has now including rainforest and lakes. (Scientists have discovered one lake on Fraser Island that is more than 300,000 years old). Aborigines would have roamed across this land for at least 40,000 years applying much the same fire regime here as they applied to other parts of the continent.

The ecology of Fraser Island would have evolved to adapt to that fire regime before the island was cut off from the mainland by rising sea levels. The Butchalla people, whose territory straddles Great Sandy Strait and Hervey Bay, would have been unlike to carry out their fire management on Kgari (Fraser Island) any differently to their fire management regime on the mainland. We know that Fraser Island Aborigines used fire by the comments of Captain Cook who passed along the main beach in the hours of darkness on 18th May, 1770. He said, "*Our course at night was guided by the great number of fires on the shore*". Thus

Fraser Island would have had relatively frequent, low intensity burns which would have resulted in a landscape with "*a park like appearance*". That is the description most early explorers gave to describe the lack of a dense understorey in the Australian bush.

Ecology of the Traditional Fire Regime

Traditional burning patterns continued on Fraser Island until the late nineteenth century. FIDO began documenting oral history from early visitors to Fraser Island about 1974 and at the same time began also collecting early description of the island. We took Jules Tardent and others with memories of Fraser Island before 1920 back to the island in 1976. All commented on the density of the understorey in 1976. It is now even much denser. The most memorable quote came from former District Forester Andy Andersen who said that as a young Forestry cadet he "*could crown every stump without getting out of the saddle*" indicating that he could ride his horse right through the forest. This was in the late 1920s. Rollo Petrie was there before and grew up there as a boy and attested to being able to ride his horse almost anywhere through the forest.

Changes due to Forestry Practices

The main objective of Forestry management was the protection of the timber resource on Fraser Island. To achieve this a network of firebreaks was established aimed at exclude all fire from the tall forests in the core of the island which contained almost all commercial timber. However, the area outside that core area was regarded as a sacrifice area which should be burnt regularly to prevent any fires burning into the tall forests. The heathland and foredune areas were deemed to be "useless" by foresters concerned primarily with harvesting commercial timber. Since it was assumed that most accidental fires were likely to be initiated near the coast from escapes from visitors campfires, the objective was to reduce any build up of forest litter in the coastal areas, thus reducing the risk to the tall forests.

The heathland areas were burnt mercilessly and in the process had a severe impact on the cypress trees between the heathland and the west coast. The scribbly gums on the older dunes (Dune System 5 and Dune System 6) were regularly "crowned" and continue to show evidence of this severe impact.

Hotter but more infrequent fires combined with the impact of grazing horses (brumbies) in the younger eastern dune systems (Dune System 1) resulted in a transformation from more open grasslands to a low woody thickets with the associated loss of pandanus. Cypress suffered some impact. Casuarina thickets established on the rocky headlands

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In Dune System 2 the “park like appearance” was maintained by the Forestry burning pattern. There was generally a significant grassy understorey which attracted grazing mammals including kangaroos and wallabies. Significant areas of Kangaroo Grass (*Themeda*) could be observed as anyone travelled down the Eastern firebreak. Since the more regular burning of this system ceased sometime during the 1960s *Themeda* has all but disappeared and so have the wallabies. Other small mammals are also much fewer in number according to the oral records. So too is the number of their predators such as the dingoes and wedge-tailed eagles.

The effect of the complete absence of fire in the tall forests combined with the impact of logging resulted in a development a dense understorey within the forest. The greater growth of species such *Monotoca* and *Backhousia* now makes that impossible. In short the composition and structure of the forest changed dramatically particularly during the latter part of the 20th Century.

Fraser Island Fire Management Plan

After considerable agitation by FIDO the QPWS in 1999 held a 3-day workshop in Hervey Bay in an attempt to establish a Fraser Island Fire Management Plan. It included ecologists and other scientific experts as well as all stakeholders. FIDO was represented. It was an interesting and comprehensive exercise and worked at determining the optimum burning regime for each of the critical ecosystems on the island. The workshop was the basis for what has been refined and developed into a comprehensive detailed plan in for the practitioners on the ground to carry out.

There was a consensus from all stakeholders present on the need to engage in more deliberate burning to attempt to replicate the Aboriginal fire regime of the past.

FIDO has been consulted at all stages of the development of the current Fire Management Plan and doesn't consider that its general thrust is placing Fraser Island in any danger. It is ecologically based rather than being based on “hazard reduction”.

Conservation View of the Fire Plan

FIDO considers that the failure to carry out any management burning places Fraser Island's unique ecosystem at much greater risk allowing the ecology to be significantly altered. That is because the fire regime that was practiced for thousands of years has resulted in the maximum biodiversity which can now be expected to be achieved.

FIDO's general (but not unqualified) support for the proposed Fire Management Plan for Fraser Island is based on our observations on Fraser Island over the past 30 years and on our observations of traditional Aboriginal burning practices in other parts of Australia.

FIDO believes that the best ecological outcome for Fraser Island will result from restoring the traditional Aboriginal fire regime practiced for tens of thousands of years.

The Fraser Island Fire Management Plan is moving towards re-establishing some of the biodiversity lost in the last 30 years since FIDO began monitoring the situation.

FIDO has been observing fire management in National Parks in every state in Australia and even in Utah a few years ago. It is also most significant that the National Park in Australia with the most intact biodiversity is Kakadu where the Aboriginal traditional burning practices have been continued with least interruption.

Based on observations FIDO is convinced that the Aboriginal fire regime provides the maximum ecological opportunity for all wildlife that has adapted and adjusted to that regime over at least 40,000 years. If that is now changed the ecosystem will not be as accommodating to the same level of biodiversity as previously existed.

FIDO does not blindly accept that all Aboriginal burning as practiced in some parts of Australia now has the science of the traditional burning practices and it is a replication of the traditional practices that we are seeking.

Some Caveats

Some of FIDO's concerns include the following:

- The science needs to be developed to ensure the optimum timing of fire ignition. FIDO believes that this will only be accomplished over time by trial and error but with very close monitoring of the outcomes of all management burns.
- The size of the coupes being deliberately ignited needs to be relatively small to achieve the best ecological outcome for each site. Small coupes should have relatively consistent topography, aspect, moisture content, ecotype, etc. Burning larger coupes in a single fire does not allow sufficient refinement and some areas will be more severely burnt than is desirable.
- The coupes need to be more random to achieve a mosaic of smaller areas.
- It is FIDO's view that fires should be lit late in the day when there is little or no wind so that they will automatically extinguish themselves early in the evening when the dewpoint rises.
- The establishment of fire containment lines should not result in a change of vegetation such as selectively removing all banksias away from roadsides.
- Management fires should not be restricted to certain limited seasons to fit in with staff availability but should occur at any time of the year when the conditions are optimum to achieve the desired outcome. For example some burns are now carried out during the wet season in Kakadu to achieve better ecological outcomes.

References

- Flannery, “*The Future Eaters*”
Petrie, R.S. “*Early Days on Fraser Island*”