6th Biennial Fraser Island Conference

Organized by the Fraser Island Defenders Organisation with sponsorship from

Sand, Sea and Sun

9.00 am to 5.00 pm

Wednesday 12th August, 2015

Innovations Centre, University of the Sunshine Coast Sippy Downs

COST: $100 Includes light lunch and morning and afternoon tea

($60 for students and concessions)

On line registrations can be made at:

https://www.eventbrite.com.au/e/6th-biennial-fraser-island-conference-tickets-16152826539

Details can be found on FIDO's web site www.fido.org.au

Supported by

Fraser Island and Great Sandy research is continuing to produce new data leading to a better understanding of this World Heritage island's Outstanding Natural Value.
The Biennial Conferences provide an opportunity to learn and keep abreast of the issues

There has been much interesting research carried out in the Fraser Island fens in recent years. The International Mire Conservation Group came in 2013. This team from University of Queensland led by Dr. Patrick Moss is examining a peat core extracted from the Puthoo fens that help us understand the ecological history going back 40,000 years

Registration — 8.30 to 9.00

SESSION 1

9.00 am to 10.20am

Chair John Sinclair AO

Butchulla Welcome

Kyleigh Currie

Kyleigh is the Contact person for the Prescribed Body Corporate of the Butchulla Aboriginal Corporation which was determined to have Native Title over more than 95% K'Gari on 24 October 2014. Determination of Native Title is the biggest single change in Fraser Island (K'Gari) management since it received World Heritage status.

University of the Sunshine Coast Welcome

Vice Chancellor Prof. Greg Hill

Opening

Hon Dr Steven Miles, MP (to be confirmed)

Minister for Environment & Heritage Protection and Minister for National Parks and the Great Barrier Reef

Theme: SUN

Keynote Address

Emeritus Professor Ian Lowe

Author, academic, researcher and gifted speaker, Ian Lowe's principal research interests are in policy decisions influencing the use of energy, science and technology; energy use in industrialised countries; large-scale environmental issues and sustainable development. He was made an Officer of the Order of Australia in 2001 for services to science and technology and for contributing to public understanding of environmental issues. Ian is the Immediate Past President of the Australian Conservation Foundation and has long been focused on the impact of Climate Change. His keynote address:

More sun, more sea, more sand? Climate change and K'Gari

Increasing average temperatures, rising sea levels and more frequent extreme events are all affecting our natural systems. We have to manage what we can't avoid, and try to avoid what we can't manage. So adaptation strategies are needed now. Responsible management should also involve trying to reduce the greenhouse footprint of activities on K'Gari.

Morning Tea

10.20 to 10.45

Outside plenary sessions there will be a rolling display by Butchulla photographer and filmmaker Luke Barrowcliffe of Goorie Vision titled *"Images of K'Gari"*

SESSION 2

10.45 am to 12.30 pm

Chair, Dr Neil Tindale University of the Sunshine Coast and Fraser Island World Heritage Scientific Advisory Committee

20 minute presentations followed by 25 minutes of questions and discussion

Fire Patterns of South Eastern Queensland Great Sandy Region in a Global Context

Philip Le C. F. Stewart, University of Queensland

Patrick T, Moss, University of Queensland

Abstract--Fire is an important driver in ecosystem evolution, composition, structure and distribution, and is vital for maintaining ecosystems of the Great Sandy Region (GSR). Charcoal records for the area dating back over 40, 000 years provide evidence of the great changes in vegetation composition, distribution and abundance in the region over time as a result of fire. Fires have shaped landscapes and ecosystems, creating fire-dependencies and fire disturbance-adapted flora and fauna with traits to survive fire, such as resprouting post-fire and serotiny of cones and fruit for example. Paleo-records and modern observations show a definitive link

between fire and climate (temperature and precipitation), with an increase in fire with increasing temperatures. Strong evidence exists of a warming of the atmosphere which is seeing an increase in warm El Nino Southern Oscillation (ENSO) years with a weakening of the Walker circulation over the past decades. Present data saw that there has been an increase in width of the tropical belt of between 2^{o} to 4.8^{o} latitude north/south over the past 30 years. This has serious implications as in a warmer world there will be an increase of wildfire risk. Of importance is the understanding of the interactions between multiple drivers of fire regimes from the past and present remembering that no single driver can explain past fire patterns and many events may be the result of multiple drivers interacting on differing temporal and spatial scales. This understanding is critical for developing fire regime management protocols for the Great Sandy Region and other similar fire-prone regions into the future.

Theme: SAND

Is the answer blowing in the wind?

Towards an environmental history of the Fraser Island/K'gari dune fields'

Prof Jamie Shulmeister, University of Queensland

Fraser Island is the world's largest sand island (c. 800 km2) and in association with the adjacent and contiguous Cooloola sand mass, is the terminus of the longest downdrift sand system on the planet. The dune fields contain one of the best archives of environmental change in the Australian sub-tropics but are remarkably little investigated. Here we propose to decipher the climate and sea-level relationships of the dune sequences at a variety of scales from decadal to multi-millennial. We will test hypotheses of dune activation and stabilisation due to storms, sea-level change and climate (rainfall and winds) and determine the long term variability of climate and environment in this globally significant region. The work will test rival hypotheses about the formation of parabolic and transgressive dune fields and the impacts of sea-level rise. It will contribute critical information to debates on inter-hemispheric climate connectivity and the climate impacts of cyclones and oscillatory climate systems. It will also provide fundamental knowledge to underpin the Outstanding Universal Value of Fraser Island, which is has been declared a World Heritage Area based on its dune fields and the unique hydrology and biota of its dune field.

Soil Studies in the Great Sandy Region

Dr Talitha Santini University of Queensland

"Fraser Island and the Cooloola Coast form the terminus of the longest downdrift sand system on the planet. Giant podzols (extending to >20 m depth) have formed over the long weathering history of the sand dunes in this system, containing buried and truncated soil profiles as a result of periods of dune erosion and building in response to climate change and sea level fluctuations. These dunefields therefore contain one of the best archives on environmental change in the Australian sub-tropics. Our project combines geomorphology, geology, geochemistry, sedimentology, and paleoclimatology to test exactly how these large sand islands form over millennial timescales and determine the long term variability of climate and environment in this globally significant region. It will also contribute critical information to debates on inter-hemispheric climate connectivity and the climate impacts of cyclones and oscillatory climate systems."

Moon Point Mires –

A 40,000 year window into the Fraser Island environment

Patrick Moss, School of Geography, Planning and Environmental Management, The University of Queensland

Moon Point contains numerous wetlands that provide an environmental record of at least 40,000 years for the iconic Fraser Island. This study, based on sedimentological and palynological analysis of six cores, has primarily focussed on the wire rush (*Empodisma minus*) dominated communities (both patterned and non-patterned) along the Moon Point and Bullock Roads, but there are a variety of other wetlands (mangroves and *Melaleuca* swamps) that can provide additional records located across the Moon Point region. Key findings suggest that there has been a significant alteration from lacustrine to wire rush dominated swamps at the start of the Holocene epoch (~12,000 years ago), which may be associated with the formation of the unique patterned fen systems; evidence of significant environmental change, possibly associated with human arrival, between 40,000 to 35,000 years ago, with a transition from a rainforest dominated community to a sclerophyll one and associated increase in burning; and once established, patterned fen ecosystems appear to be highly stable, although there is evidence that vegetation thickening may be occurring at the edge of the wetland and other hydrological changes (increase in mangroves and grass), possibly associated with alterations in fire regimes and road construction linked to European settlement of the island.

LUNCH

12.30 to 1.30 pm

SESSION 3

1.30 pm to 3.15 pm

Chair, ????, University of the Sunshine Coast

Workshop

30 minute plenary session with a 10 minute introduction followed by 20 minute discussion

Making better use of a valuable resource

Dilli Village — A case study

Dilli Village has been an under-utilized facility on Fraser Island managed by the University of the Sunshine Coast. Kim Walker and Duncan Thompson have been engaged in a really exciting project master-plan to improve the educational and research experiences at Dilli Village. This session will begin with a vision for Dilli Village from Dr Kim Walker followed by a plenary discussion on options to make better use of the well-located Dilli Village facility.

Theme: SEA

15 minute presentations followed by 30 minutes of questions and discussion qt the end of the session

The Marine Environment of the Fraser Island Region

Dr Joachim Ribbe

Associate Professor in Climatology, University of Southern Queensland

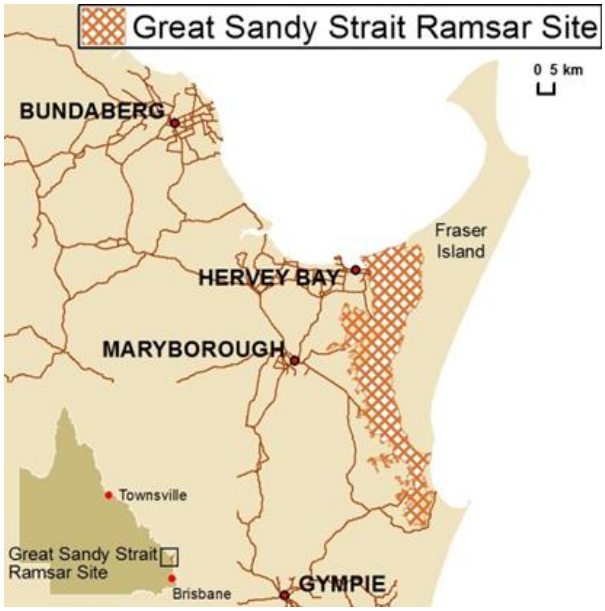
The sea surrounding Fraser Island is one of the most biodiverse and unique Australian marine environments. It embraces the waters of Hervey Bay, the Great Sandy Strait and the continental shelf to the south of Fraser Island and is home to rare endangered marine species including humpback whales, marine turtles, and dugongs. However, it is also characterised by unique ocean and climate processes that are the physical drivers of environmental conditions and high marine primary productivity.

In this presentation, I will discuss and review the forces that shape marine environmental conditions and review some of our recently made discoveries. These include the identification and characterisation of the "Southeast Fraser Island Upwelling System" using satellite remote sensing data and the classification of Hervey Bay as a hypersaline system using field data collected during several research cruises.

Great Sandy Strait Ramsar Site

Mike Ronan, Manager, Queensland Wetlands Program.
Department of Environment and Heritage Protection, Queensland

Mike Ronan will introduce the Great Sandy Strait and describe some the values that make the Ramsar site so special.



The Great Sandy Strait Ramsar site is one of Queensland's most important coastal wetlands. The Strait is a sand passage estuary between the mainland and the World Heritage-listed Fraser Island, encompassing portions

of the eastern fringe of the Island. It is the least modified of three such passages in Queensland. The Great Sandy Strait is the largest area of tidal swamps within the South East Queensland bioregion, consisting of intertidal sand and mud flats, making up roughly one-third of its area, extended seagrass beds, mangrove forests, salt flats and saltmarshes, and often contiguous with freshwater *Melaleuca* wetlands and coastal wallum swamps. The Strait is an exceptionally important feeding ground for migratory shorebirds and important for a wide range of other shorebirds, waterfowl and seabirds, marine fish, crustaceans, oysters, dugong, sea turtles and dolphins.

Mike Ronan is the Manager of the Wetlands unit in the Department of Environment and Heritage Protection, based in Brisbane. For the last ten years he has managed the Queensland Wetlands Program which coordinates wetland related projects in Queensland through various government departments. The program also provides a wealth of wetland resources and guidance for land managers such as Natural Resource Management groups via the **Wetland*Info*** website.

What's happening with Australia's Shorebirds: Locally, Nationally and throughout the flyway?

Dr Jon Coleman, Chairperson, Queensland Wader Study Group

Great Sandy Strait is an internationally important wetland recognised under the Ramsar convention and one of the most significant migratory shorebird sites in Australia. Up to 40,000 shorebirds have been recorded using this location during the Australian summer. This talk will describe the basic lifecycle of migratory shorebirds that use the Great Sandy Strait, and their migration patterns as well as highlighting the important roost sites used by shorebirds in the region. National population trends for a number of species will be presented and then compared to local changes in shorebird numbers in the Great Sandy Strait Ramsar site, using data gathered by the Queensland Wader Study Group over a 20 year period. Those trends will be discussed in relation to local, national and international factors"

Afternoon Tea
3.15 to 3.40 pm

SESSION 4
3.40 pm to 5.00 pm

Chair, Sue Sargent Chair of Fraser Island World Heritage Community Advisory Committee and the Fraser Island Natural Integrity Alliance

15 minute presentations followed by 10 minutes of questions and discussion at the end of the session

Theme: K'GARI HABITAT

Diet and body condition of dingoes on Fraser Island (K'Gari)

Linda Behrendorff (QPWS)

As top-predators, dingoes (*Canis lupus dingo*) play an integral role in the food web on Fraser Island. Subsidising such predators with human-sourced food (HSF) can disrupt this balance. The occurrence of HSF in dingo diets is poorly understood. A greater understanding of dingo diets is imperative given the potential effects of HSF on dingo health, dingo impacts on other prey fauna, the nature of interactions between humans and dingoes, and on the way dingoes and humans are managed on Fraser Island. In this study through the collation of a variety of data from dingo scats, stomach contents, remote-camera monitoring and necropsy records collected between 2001 and 2015, a description of the diet and health of dingoes on Fraser Island has been produced. We also focus on the role of management practices in altering the occurrence of HSF in dingo diet records, identify fauna species of significance to Fraser Island dingoes, and describe their overall health and body condition.

Balancing dingo conservation with human safety on Fraser Island: The numerical and demographic effects of humane destruction of dingoes

Ben Allen

Dingo ecologist University of Queensland

Australian dingoes are threatened by interbreeding with domestic dogs. As a refuge from further interbreeding, the conservation significance of dingoes on Fraser Island is unquestioned. However, some dingoes presenting genuine human safety risks are humanely destroyed. We explore the potential effects of this on the sustainability of the Island's dingo population. Dingo abundance was 76–171 adult individuals during the mating (pre-whelping) season of 2012. A total of 110 dingoes were destroyed between 2001 and 2013. Approximately 66% of known-age dingoes destroyed were < 18 months old and 65% of known-gender dingoes destroyed were male. In any given year, no more than four female dingoes of any age were destroyed during dingoes' annual mating and whelping seasons. On only one occasion was an adult (and subordinate) female dingo destroyed during this period. Available data therefore indicate that the spatially and temporally variable removal of so few female and/or adult animals from a population of this size is highly unlikely to have adverse effects on dingo population growth rates or breeding success. Adverse effects of humane destructions might be expected to increase if a substantially greater proportion of adult and/or female dingoes are targeted for destruction in the future.

DNA Barcoding of South East Queensland Rainforest Plants.

Marion Howard.

University of the Sunshine Coast

Biodiversity conservation is important for species and ecosystem adaptive capacity to change. Australian rainforests contain a high proportion of the continents terrestrial biodiversity. Traditionally studies have focused on the Wet Tropical rainforests of Northern Queensland. The biodiversity and community assemblages of the subtropical rainforests of South East Queensland are less well known, but recent studies have indicated that these rainforests contain areas of high endemism which may indicate refugial areas. Refugia are vital for the recolonization of the surrounding areas following disturbance, especially in relation to climate change. One area that has been found to contain significant levels of endemism is The Great Sandy Region. My study will utilise the DNA barcoded library of South East Queensland Rainforest plants to analyse the phylogenetic patterns and relatedness within and between the Great Sandy Region and surrounding subregions, and attempt to determine if the phylogenetic relationships indicate refugial areas that are important for species survival.

Theme: Community Involvement in Fraser Island (K'Gari)

Whose Fraser Island?

John Sinclair AO (Fraser Island Defenders Organisation)

Community volunteers have shaped the history of Fraser Island over the past half-century. They have played a significant and increasing role in assisting the management of Fraser Island. Volunteers have developed a significant extension to the Great Walk, worked as campground host and helped keep weed infestations controlled as well as making a very significant contribution to the management through honorary contributions to the Scientific and other World Heritage Advisory Committees. Volunteers have played a role in facilitating research. Productive partnerships between volunteers and government agencies are being facilitated through the Fraser Island Natural Integrity Alliance (FINIA) but there is still more potential goodwill from volunteers that can be harnessed to the benefit of the environment and with savings to governments as well as adding to the growing numbers of citizens with a stake in the management of Fraser Island (K'Gari).

Rapporteur and close

Andrew Sinclair