



Annual Conference

**Ko Te Kawa o Tangaroa, he kawa ora –
Living on a dynamic coast**

The background of the lower half of the page is a photograph of a sandy beach. In the foreground, there are several clumps of green and brown grasses. A piece of light-colored driftwood lies on the sand. A large, wavy, light teal graphic element overlaps the top of the beach image.

**Whanganui
10-12 March
2021**

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Te Awa Tupua

For more than a century the laws, regulations and actions of the Crown have broken the Whanganui River down into parts. The Te Awa Tupua framework seeks to take a catchment-wide approach to ensure that all of the waterways which together join to form the Whanganui River are viewed and managed, not in isolation, but with reference to the whole River as an interconnected ecosystem.

Furthermore, to Whanganui Iwi, the Whanganui River is viewed as a living being, Te Awa Tupua; an indivisible whole incorporating its tributaries and all its physical and metaphysical elements from the mountains to the sea. And therefore the health and wellbeing of one element of the River is intrinsically connected to the health and wellbeing of the whole River, its mouri and its mana.

The enduring concept of Te Awa Tupua – the inseparability of the people and River – underpins the desire of Whanganui Iwi to care for, protect, manage and use the Whanganui River through the kawa and tikanga

maintained by our tūpuna and their descendants.

Te Awa Tupua recognises a set of indigenous values at law that reflect the innate relationship of the River to the people and the people to the River as guardians and sovereign partners in protecting the mana of the river and leading water policy, management, and planning. It also represents a move towards restorative justice and sustainable practices for healthy waterways.

Nō te kawa ora a 'Tupua te Kawa' hei taura here nā Te Awa Tupua me ōna tāngata ki te kawa nō tawhito rangi.

The natural law and value system of Te Awa Tupua, which binds the people to the River and the River to the people.

To read more:
www.ngatangatatiaki.co.nz/our-story/tupua-te-kawa

Tāhuna Ora Waiata

Tāhuna Ora

Tai timu, tai pari
Tai mata tāhuna
Piri tata, piri tahi
Piri kia ora
Mō āpōpō,
mō ake, ake tonu rā

Dunes, strong and vigorous

Tides that ebb and flow
Caressing the banks' brow
Stand together and embrace as one
To ensure survival for tomorrow,
for the future, through the eons of time.

The Coastal Restoration Trust of New Zealand

The Coastal Restoration Trust is a nationwide organisation that brings together the knowledge and experience of communities, iwi and hapū, management authorities, industry, and science agencies to save and restore our sand dunes and coastal ecosystems.

The Coastal Restoration Trust is an incorporated Charitable Trust formed in 2007 to continue the work of the Coastal Dune Vegetation Network. Our aim is to support and encourage the development of cost effective practical methods for coastal communities and management authorities to restore natural coastal ecosystems including the natural form and function of coastal dunes.

Our goals are:

- To provide a network for information exchange on sustainable management of dunes and coastal ecosystems;
- To facilitate research on NZ coastal and dune ecosystems; and
- To promote public awareness of proven methods for protection, restoration, conservation and sustainable management of coastal and dune ecosystems.

To achieve these goals we:

- Organise an annual conference and workshops to discuss issues, share information and hear the latest research;
- Run a website where information is free and easily accessible and can host community coast care web pages;
- Commission research projects and offer a student scholarship; and
- Produce technical bulletins and articles detailing best practice methods for dune restoration.

The Coastal Restoration Trust Trustees

The Coastal Restoration Trust of New Zealand Board comprises up to 15 trustees from a wide range of backgrounds, organisations and locations around the country. The trustees have long term experience in a wide range of fields, such as botany, dune morphology, raranga, governance and community restoration projects.

Current Trustees

Chair Greg Bennett - North Canterbury

Treasurer Colin Ryder - Wellington

Administrator Lyneke Onderwater

Tim Park - Wellington

Betsy Young - Far North

Alison Waru - East Cape

David Bergin - Bay of Plenty

Laura Shaft - Northland

Graeme La Cock - Wellington

Lyle Mason - Southland

Jo Bonner - Whakatane

Jason Maguiness - North Auckland

Conference Contact Numbers

For general conference questions:

021 268 2052 (Lyneke Onderwater)

For field trip enquiries phone:

021 227 7189 (Scotty Moore)

Conference Organising Committee

Graham Pearson

Lyn Pearson

Scotty Moore

Graeme La Cock

Colin Ogle

Neil Mickleson

Jenny Duncan

Lyneke Onderwater

Photo by Karina Hunt and Bruce Tonkin



The Conference Venue

The Grand Hotel,
Corner St Hill and Guyton Streets,
Whanganui

This will be the venue for the conference until 11am on Thursday, when the field trips commence and depart from here.



Parking

The Grand Hotel has a limited amount of parking available. Other parking nearby is mostly paid or limited and parking wardens are active. We recommend that you walk to the venue if your accommodation is not too far.

Welcome from the Chair



**Ngā mihi nui ki a koutou katoa.
Nau mai, haere mai ki tēnei hui.**

Greetings and a warm welcome to the 2021 conference of the Coastal Restoration Trust of New Zealand, Living on a Dynamic Coast - Ko Te Kawa o Tangaroa, he kawa ora.

This is a return to the Trust's beginnings as our first conference as a Charitable Trust was in Whanganui in 2008. Back then, I remember the indomitable Ted Frost showing us the dunes and the battle Castlecliff Coast Care were waging on areas of wattle, lupin and other weeds. Many thanks to Graham and Lyn Pearson for taking Ted's mahi to new levels and their update at every conference is always inspiring. I am looking forward to seeing the results of thousands of hours of volunteer efforts and investment from community organisations, councils, DOC and others.

The Whanganui-Manawatū Region can be windy. We all know wind + sand + vegetation = sand dunes and the sometimes exceptional wind, excess sand and vigorous plants in the Whanganui-Manawatū build stonking great sand dunes.

I am looking forward to seeing these dune systems and all the flora and

fauna that live there, and meeting the other coasties who are kaitiaki in this place.

I invite all of you to contribute in making our conference an enjoyable and valuable experience. Please ask questions, offer advice and enhance the collective experience and knowledge of our huihuinga.

Many thanks to our sponsors, especially Horizons Regional Council, who are our generous hosts. These sponsors make it possible for us to hold the conference and keep the registration fees affordable. Also a special thanks to the conference organising committee who have put in the hard mahi to produce this event.

Kia ora,

Greg Bennett
Tiamana

Welcome from Whanganui District Mayor



Ngā mihi nui ki a koutou katoa.
Haere mai ki Whanganui

It is my delight to welcome the members of the Coastal Restoration Trust of New Zealand to Whanganui for their national conference.

Protecting and restoring our nation's coastline is such an important task, and often thankless. I want to acknowledge this debt of gratitude and say to you all: thank you so much for your work.

Whanganui's coastline is rugged and dynamic. Dunes migrate (indeed much of the central city is built on ancient dunes that have come to town over many centuries), cliffs erode, and vegetation clings fast against the westerly wind.

Having three beaches close to the city means that they become recreational places and the district needs to balance a variety of users - surfers, anglers, walkers, riders, drivers and those who simply want to enjoy the incredible environment of our coast.

As a major step towards this, the Council is looking to put a Coastal Management Plan in place in the near future in order to protect and preserve

the strip from Whangaehu to Ototoko.

Best wishes for your conference and I hope you are able to get out and see the other things that make Whanganui the most beautiful city in New Zealand - our cafés, the wonderful built heritage, premier parks and of course our unique river - Te Awa Tupua. And maybe take a bit of Whanganui back to your home - perhaps a piece of blown glass from one of our incredible galleries.

I hope you experience Whanganui's famous manaakitanga, and enjoy your stay.

Hamish McDouall
Mayor of Whanganui District

Welcome from Horizons Regional Councillor



Kia ora, it is a pleasure to welcome you to the Horizons Region and Whanganui.

As an elected representative in the region I have a passion for the local environment and ensuring it is thriving. One of the key aspects to achieving this is the support and acceptance from the local community. Communities such as Foxton Beach that are actively out there pulling lupin and marram to allow plants such as maakoako and slender clubbrush to flourish.

Connecting people with places and making knowledge easy to consume and explore, helps to give our communities a better appreciation for the role our dune systems play and the importance of protecting them.

The impact from humans on many of our sensitive ecosystems puts immense

pressure on them and the life they support. As people better appreciate and understand these wild places, they are more likely to respect and protect them.

I look forward to seeing you in Whanganui, learning more about the challenges and opportunities of these ecosystems, and sharing the stories of our dunes with our local communities.

Sam Ferguson
Elected Councillor

Keynote Speaker

Professor James Renwick is a leading climate scientist with a strong national and international reputation, and four decades of experience in weather and climate research.

His appointment as a Lead Author and Coordinating Lead Author on three Assessment Reports of the

Intergovernmental Panel on Climate Change (IPCC) demonstrates his expertise. He has also been involved in the governance of the World Climate Research Programme for the past eight years. He was awarded the 2018 Prime Minister's Prize for Science Communication.



Dunelands of the southwest North Island: Driving forces, development, and future scenarios

Dunes define the coast of the southwestern North Island from Patea south to Paekakariki. This coastal dunefield is the largest in New Zealand at around 950 km² in size, with dunes transgressing inland as far as 18 km from the contemporary coast. The size of the dunefield reflects key controls on dune-building processes: a very high sediment supply; a strong onshore wind and wave regime; and along much of the coast a low relief nearshore, beach, and back-beach environment that does not restrict dune development.

The dunes of the southwestern North Island have formed semi-continuously over approximately the past 8,000

years. Dune development along the coast has been delineated through detailed soil mapping and the use of dating techniques such as optically stimulated luminescence dating which dates the time since dune sand was last exposed to the sun.

For the future the dunes of the southwest North Island represent a valuable buffer against the effects of climate and sea-level change driving erosion of the coast. However, coastal inundation remains a threat that dunes are unlikely to counter.



Dr Alastair Clement

Dr Alastair Clement is a senior lecturer in physical geography based in the School of Agriculture and Environment at Massey University in Palmerston North.

Alastair is a coastal geomorphologist who specialises in understanding the evolution of coastal environments in response to fluctuations in relative sea-level, changing climatic conditions, and the impact of tectonics. Alastair also researches how sea-level has changed around the New Zealand coast in the past.

Vegetation and plants on the dynamic coast from Taranaki to Manawatū

Coastal habitats between South Taranaki and Manawatū can be divided broadly into sea cliffs (mudstone, with overlying compacted peat, tephra and loess) and dune sands. Within these are gradations of moisture from saturated to dry. Constructing a picture of the pre-human vegetation of the coastal strip is made difficult by the present-day paucity of indigenous vegetation and the lack of written records or other evidence.

In rural areas, pasture mostly extends to the sea clifftops or foredunes where exotic marram grass (*Ammophila arenaria*) dominates; coastal plant communities have been largely replaced by plantations and urban development; weeds have modified almost every natural area. Native plant species have become extinct within the past three decades and many others are regionally or nationally threatened.

The mainly southwest aspect of the sea cliffs and their freshwater seepages provides a refuge for some plants intolerant of drought, as do dune hollows, stream margins, swamps, lakes and estuaries, but even these wet areas are changing rapidly, with losses of native plant biodiversity.



Colin Ogle

Colin Ogle retired in 2000 from his position as Conservancy Advisory Scientist with Department of Conservation (DOC) in Whanganui.

General ecology, with a leaning towards botany, has always been and continues to be his main interest. Since retiring, most of his ecological work has been as a volunteer, apart from surveying the proposed Waipipi windfarm site and some part-time lecturing at Massey University. He has contributed thousands of plant specimens to national herbaria, as well as photos and text to the NZ Plant Conservation Network and i-Naturalist; also bird records to e-Bird; public lectures on botanical and travel themes; worked with local conservation groups, especially at Gordon Park Scenic Reserve.

Colin is a co-author of recent papers on new weeds nationally, and monocot weeds of the Manawatū Plains Ecological Region. This last-named paper featured many weeds of the local dune country (Foxton Ecological District).

Living on a dynamic coast with little, little known insects, monsters and what do we know?

Insect sampling by pitfall traps along transects in Castlecliff sand dunes has shown a diverse beetle fauna. Differences in beetle species composition were observed along transects. The differences depend on the land inward distances pitfall traps were set from the sea side edge of the sand dunes.

Accumulation of species richness showed that more sampling needs to be carried out. The species collected

were predominantly small and inconspicuous, and their ecology of those species is poorly known. Coastal restoration often focuses only on plants, birds and maybe some larger known invertebrates.

For seaside restoration to be effective and all inclusive, it is essential to carry out research on interactions between coastal invertebrates, plants and other animals.



Franz-Rudolf (Rudi) Schnitzler

It has been a lifelong passion for Rudi to study entomology, which Rudi accomplished late in his life. Rudi has an MSc in Entomology and Taxonomy and a PhD in Insect Ecology and Biodiversity.

Rudi has worked for Plant & Food Research, Ministry for Primary Industries and Landcare Research (New Zealand Arthropod Collection) of which Rudi is still a research associate.

Through his work and volunteer experience Rudi is a generalist entomologist. His main passion, however, are flies - particular of the family *Tachinidae*, whose larvae are parasitic on other insects. Rudi is semi-retired now and lives in Whanganui.

Field trips/Keeping Safe

We will visit locations outdoors in environments that require you to be responsible for your own health and safety.

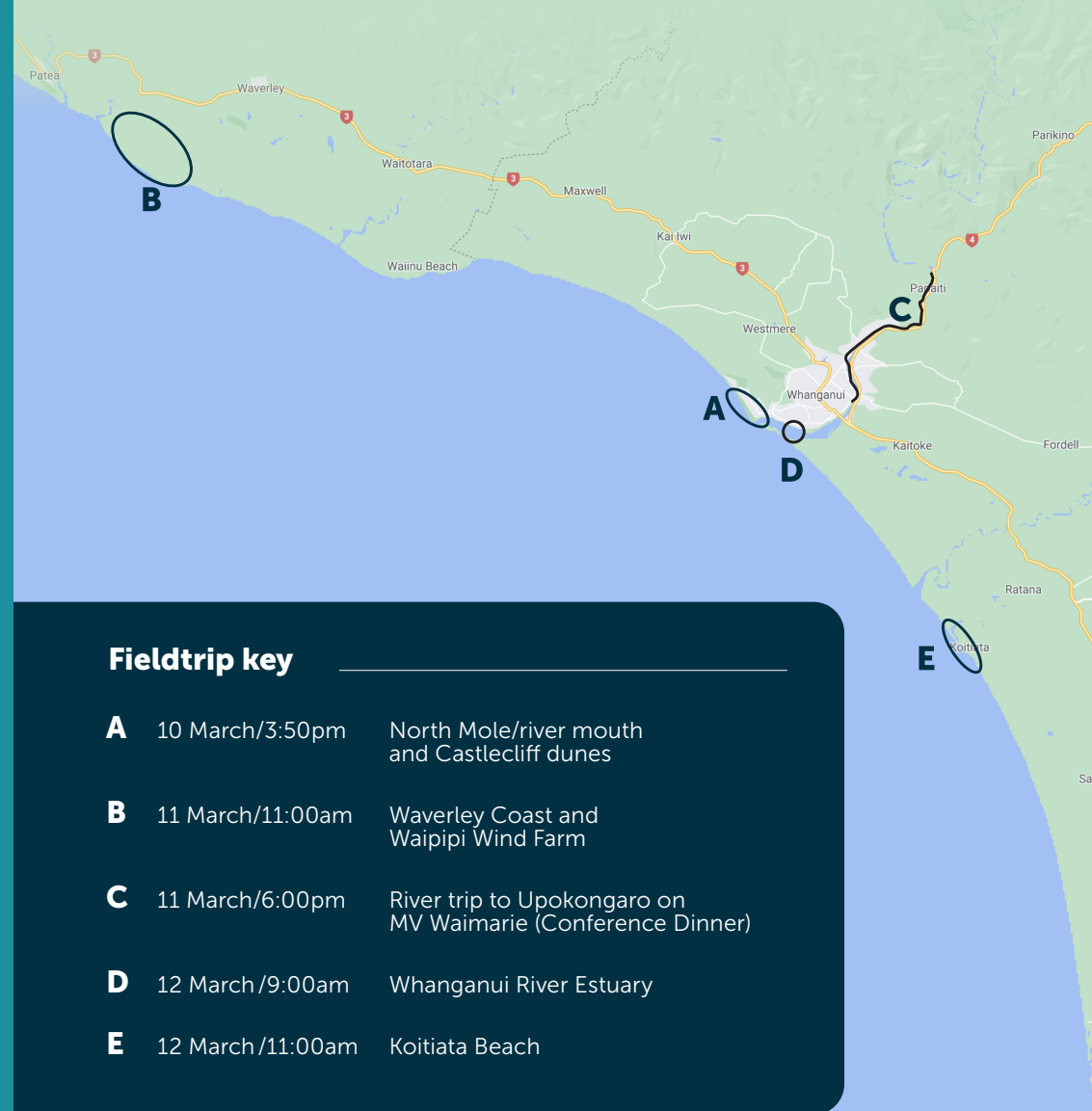
Please ensure that you:

- Have appropriate clothing to deal with the very variable weather conditions, from water-proof and warm clothing to hats and sun-block.
- Wear footwear appropriate for walking and providing proper grip on wet, slippery surfaces.
- Have any medication and/or food/drink you may need on a trip of some hours.
- Keep within safety barriers, adhere to safety advisory signs and instructions, take care when crossing roads and keep a safe distance from hazards like steep drop-offs, fast flowing water or other areas that might present a safety risk.
- Inform the conference coordinators before you leave of any special medical conditions or needs for which you may require assistance.

If you don't have the right clothing please ask a conference coordinator before you leave on the trip, so that assistance can be provided in finding appropriate gear.

Have enjoyable, safe and healthy field trips!

Field trips/Map Overview



Castlecliff

3:50-6pm
Wednesday
10 March

Between 1908 and 1929 moles, (river retaining walls) were built to facilitate better access for coastal shipping. This has resulted in a large triangular area of sand accreting on Castlecliff Beach. The shoreline has moved seaward up to two metres annually.

Field trip participants will pass through large rear dunes predominately populated by marram grass and *Acacia sophorae* (coastal wattle) to spinifex-dominated fore dunes. A concrete bunker built in 1946 now sits about 150m back from the high tide mark, vividly demonstrating the accretion.

Castlecliff Coast Care (CCC) work on the rear and fore dune areas, planting about 600 native plants every year and doing weed control. Whanganui District Council spends \$40-60K annually to remove sand from coastal infrastructure, CCC hopes to demonstrate that the successful retention of sand using native sand binders will encourage the council to adopt this approach to sand control. Many schools and community groups help with planting and watering.

The field trip will also visit the southern end of the Castlecliff sand

dunes, where the port, river mouth and moles are located. In 2017, the Whanganui River was recognised as "Te Awa Tupua", giving it legal rights of a person, a world first. Te Pūwaha (the river mouth), will be the first true community-led exercise for management of a project under this new legal status.

Graham Pearson,
Castlecliff Coast Care Coordinator



Waipipi & Waverley Beach

11-5pm
Thursday
11 March

Local Coastal Geology

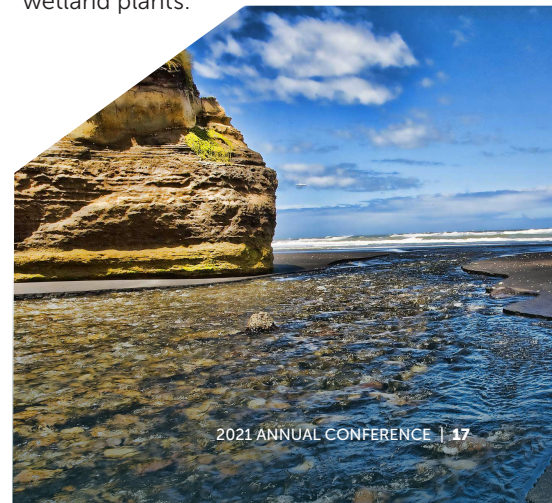
Whanganui's Coast is an internationally significant location for studying the climate of the last 5 million years. A quirk of geological history provides a near perfect sequence of exposed sediment layers and coastal terraces that have been cleverly interpreted to illuminate the spectacular rise and fall of sea-levels as ice age-interglacial cycles sent sea levels up and down hundreds of metres.

20,000 years ago you could have walked to Nelson from here. The last 10,000 years have been exceptionally stable. How far back do we need to look to see a climate record like what we are now heading for?

Local science educator and conservationist Keith Beautrais will try to explain some of this and answer your questions.

Between the dunes of Foxton Ecological District and the raised terraces of Manawatū Plains Ecological District is a line of dune swamps and lakes, impounded against the terraces by sand. We are not exploring any of these sites but we will pause twice to view the wetlands from the buses

near Waverley. As we travel west from Whanganui, we pass an example, Rotokawau-Virginia Lake, before turning off SH3 onto Brewer Road then Ihupuku Road. Lake Waiau, a DOC-managed reserve, is on the right, followed by the privately-owned Lake Herengawe. Both have swamps in their upper arms. Herengawe drains into the multi-armed Ihupuku Swamp, of which 39 ha are DOC-managed as a Wildlife Management Reserve. This was probably a dune lake before closing in with harakeke, swamp sedges and shrubs. All these wetlands are important for wildlife such as fernbird and contain nationally and regionally rare flora, including swamp greenhood and lady's tresses orchids. Some of the lakes have a significant draw-down of water in summer, exposing mats of wetland plants.



Whanganui River Estuary

9:00am
Friday
12 March

Peter Frost, Ornithologist

The Whanganui River Estuary lies at the end of the third longest river in New Zealand and the longest navigable one. Over much of its 290km length, from its headwaters on the northern flank of Mt Tongariro, it flows through often narrow, deeply incised sandstone and mudstone gorges flanked, in the middle reaches, by native forests of the Whanganui National Park. Much of the remaining 7130 km² catchment has been converted to open pasture, cultivated land and forestry plantations. Increased erosion of these friable soils, both on the surface and through extensive landslip over the past century, has hastened this inflow of sediment to the Whanganui Estuary, gradually infilling it.

Other forces are also affecting the estuary: water abstraction in the headwaters for hydropower; nutrient and chemical runoff from agricultural, urban and industrial land; and the impact of numerous engineering works—roads, bridges, rock walls in the river, groynes, occasional dredging, stabilised embankments and sundry other flood-control measures.

As Whanganui has expanded, the estuary's margins have been reduced and extensively modified, undoubtedly limiting organic matter and nutrient inputs. Combined with the apparent instability of the bottom sediments, driven by periodic strong winds and floods, its productivity seems limited. Although around 30 wader and waterbird species have been recorded, most are transient, using the estuary as a stop-over point on their annual migrations.

During 2006–2012, surveys showed 97% of all 55,000 individuals recorded comprised just 10 species, with gulls, terns and a few waders predominating.

This excursion provides an opportunity to consider several questions. How relevant is this estuary for native biodiversity in the wider national context? Given the prospects of climate change, ongoing development, and the many recreational and other demands being placed on it, what is its future? Can it be managed better?

Koitiata

11:00am
Friday
12 March

The Koitiata Wetlands Restoration Project is a community initiated scheme focussing on the Koitiata Domain Recreation Reserve, an area bordered by the village, Santoft Forest, the Turakina River and the coast. This is Crown land held for recreation purposes under the Reserves Act, and Rangitikei District Council are appointed to control and manage it.

The aim of the project is to improve and preserve the ecology of this wetland area so it protects and supports biodiversity and provides an area for residents and visitors to explore and enjoy. This long term project includes weed removal, minimising sand blow, water management, replanting and improving recreational access to the area.

Along with an active community group we are partnering with Ngāti Apa, Department of Conservation, Rangitikei District Council, Horizons Regional Council, Land-based Training and the Rangitikei Environmental Group who have variously contributed advice, resources and man power.

In the 6 months the project has been going, 300 man hours have been committed to removing weeds

(ragwort, lupin, willow, poplar, agapanthus, gorse) in the areas in front of the village and investigating a change in the water table as a result of land recontouring. We've taken a project approach including identifying a project coordinator, developing an overarching plan, securing seed funding from the Koitiata Residents Committee, development of resources including weed management information sheets, spray diaries and undertaking regular communication/engagement activities.

Conference attendees will be provided with an overview of the area, the project and results of recent vegetation and bird surveys. Speakers include Chris Shenton (Ngāti Apa), Jo Anson (Project Coordinator), Colin Ogle (Botanist) and Graeme La Cock (CRT/DOC). Members of the project group and partnering organisations will then show people around the domain and coastal area explaining the approaches taken to date, challenges encountered and seeking the shared wisdom of the group.

We look forward to welcoming you.

Ko Te Kawa o Tāngaroa, he kawa ora - Living on a dynamic coast

2021 Whanganui Conference Programme

DAY 1 Wednesday 10 March 2021

Time	Topic	Speaker/Facilitator
8:00	Registration desk opens. Tea and coffee available	
9:00	Karakia Significance of the Awa and the coast to Whanganui Iwi	John Maihi (Whanganui Iwi) Ben Potaka (Whanganui Iwi)
10:00	Chairman opens conference	Greg Bennett
10:10	Setting the scene for Whanganui	Mayor Hamish McDouall (Whanganui District Council) and Councillor Sam Ferguson (Horizons Regional Council)
10:30	Morning tea	
11:00	Session 1	Facilitated by Greg Bennett
11:00	Dunelands of the southwest North Island: Driving forces, development, and future scenarios	Alastair Clement (Massey University)
11:30	Vegetation and plants on the dynamic coast from Taranaki to Manawātū	Colin Ogle (Botanist)
12:00	Living on a Dynamic Coast with little, little known insects, monsters and what do we know?	Rudi Schnitzler (Entomologist)
12:30	Sponsor Talk	Lizzie Daly (Horizons Regional Council)
12:40	Lunch	
1:40pm	Keynote speaker	Professor James Renwick (Commissioner of the Climate Change Commission)
2:20pm	Regional Roundup	Facilitated by Graeme La Cock
3:20pm	Afternoon tea	
3:50pm	Field trip to North Mole, river mouth and Castlecliff dunes	Graham Pearson (Castlecliff Coast Care) Jock Lee (Port Development) James Barron (Whanganui District Councillor)
6pm	Return to The Grand/Whanganui	

DAY 2 Thursday 11 March 2021

8:30	Trust resources and updates	Tim Park
9:00	Regional Roundup	Facilitated by Laura Shaft
10:00	CRT projects update	Simon Hoyle and Janet Andrews on video project, and CRT trustees
10:30	Morning tea	
11:00	Bus travel to Waverley and Waipipi - Dune lakes and terraces, clifftop plant communities, sand mining history	Colin Ogle (Botanist) Keith Beautrais (Science Educator) Stewart Reid (Waipipi Windfarm) Tama Pokai (Landblocks Shareholders/Te kaahui o Rauru)
5:00pm	Return to venue	
6:00pm	Conference dinner and live entertainment on Waimarie Paddle Steamer, while cruising the Whanganui Awa (at extra cost)	

DAY 3 Friday 12 March 2021

A field trip to sites south of Whanganui

8:45	Meet for field trip	
9:00	Depart to Yacht Club for estuary viewing	Peter Frost (Ornithologist)
10:00	Travel to Koitiata Beach	
10:30	Morning tea	
11:00	Koitiata Beach History, plants, river movement, residents' improvement project	Chris Shenton (Ngāti Apa) Jo Anson (Koitiata Wetlands Restoration Project) Colin Ogle (Botanist) Graeme La Cock (CRT/DOC)
1:00pm	Lunch	
2:00pm	Depart Koitiata	
2:30pm	Arrive at Languard Bluff viewpoint	(Near airport)
3pm	Farewell	
3:30pm	Travel to Whanganui airport	AKL flights from Whanganui leave at 4:45pm

Sponsors

The Coastal Restoration Trust of New Zealand would like to thank the following conference sponsors, without whom this conference and the on-going success of the Trust would not be possible.

Gold Sponsor & Host



Silver Sponsor



**WHANGANUI
DISTRICT COUNCIL**
Te Kaunihera a Rohe o Whanganui

Other Sponsors



Useful Websites

Coastal Restoration Trust:
www.coastalrestorationtrust.org.nz

Plant Calculator:
www.coastalrestorationtrust.org.nz/resources/planting-calculator

Coastal Reference Database:
<https://ref.coastalrestorationtrust.org.nz>

Handbook:
www.coastalrestorationtrust.org.nz/resources/coastal-restoration-handbook

Monitoring Database:
<https://monitoring.coastalrestorationtrust.org.nz>





**COASTAL RESTORATION TRUST
OF NEW ZEALAND**

Tāhuna Ora

