

Coastal Treasures of Murihiku Southland, 18-20 March 2020

ABSTRACTS, BIOGRAPHIES AND OTHER INFORMATION ABOUT SPEAKERS AND THEIR PRESENTATIONS



Rob Phillips (CEO, Environment Southland)

Setting the Scene for Southland

Rob Phillips commenced with ES in August 2012, having previously been Director of Operations with Taranaki Regional Council. Prior to that Rob had an extensive background with Environment Canterbury in a variety of roles, including working as a soil conservator, and managing biosecurity and land.

Rob has extensive experience working with stakeholders both in the local areas he worked in and in a number of national organisations.

Rob has chaired a number of national level regional council staff groups covering biosecurity and biodiversity. In more recent times he has been appointed the Chair of the Landcare Research Outcome Advisory

Panel; is a member of the Biosecurity Ministerial Advisory Committee; is a member of the NSC Biological Heritage Science Challenge Governance Group; and is also the Chair of the Envirolink Governance Committee.

Rob feels he is privileged to be working for an organisation with responsibility for addressing significant and complex resource management challenges in a region very dependent on use and management of water and land. He is committed to working collaboratively, with a focus on developing long-term solutions.



Nick Ward (Environment Southland)

New River Estuary: an estuary under pressure

New River estuary is a shallow intertidal dominated estuary in Southland. The estuary drains a 4314km² catchment comprising of >75% pasture, of which 60% is intensive pasture. Historical land reclamation and intensification of land use in the catchment have led to significant degradation of the estuary over time. New River estuary is a part of Environment Southland's long term estuary monitoring program, which includes broad scale habitat mapping in addition to sediment chemistry, sedimentation and macroinvertebrate community composition at 5 key sites across the estuary. Gross eutrophic zones (GEZ) represent areas with >50% macro-algal cover, >25% mud content and no oxygen in the sediment. Since 2001, GEZ areas have

increased from 23ha or 1% of the intertidal area to 428ha or 15% of the intertidal area in the estuary. Seagrass loss in the Waihopai Arm (the upper estuary) has been catastrophic, with >94% of seagrass displaced by fine sediment and macro-algal mats between 2001 and 2018. The lack of oxygen, accumulation of nutrients and metals in the sediments of GEZ areas has led to a severely degraded macro-invertebrate community in which only a few tolerant species persist. This state of severe degradation primary reflects excessive fine sediment and nutrient loads associated with land use practices within the catchment. The talk will also reflect on remediation options for Southland estuaries.





Keryn Roberts (Environment Southland)

Coastal Lakes: Catchment Land Use and Lake Health

Environment Southland monitors three coastal lakes (Lake George, Lake Vincent and The Reservoir) as part of a wider Lakes and Lagoons State of Environment monitoring program. Since 2015, the characterisation of Southland's coastal lakes has been necessary to improve our understanding of how these systems respond to nutrient and sediment loads. Southland's coastal lakes tend to be in regions that are extensively used for agriculture and therefore are subject to the pressures of land use inputs. Because these lakes are shallow there is a strong interaction between the water column, sediment and in lake vegetation. In general, the increased residence time of the water within a lake allows for settling out of suspended sediments and processing of nutrients. However, if nutrient and sediment loads were to increase beyond an ecological

threshold there is a significant risk of a regime shift from a clear macrophyte dominated system to a turbid algal dominated system. Catchment land use practices in Southland such as wintering, feed pads, silage storage and vegetation clearing can increase nutrient and sediment loads, if not managed effectively, indirectly impacting on lake health. The talk will summarise the state of the coastal dune lakes monitored in Southland and discuss current issues facing lake health.



Lloyd Esler (Environment Southland)

New River Estuary

New River Estuary (also called Oreti River Estuary) was an important resource for Māori with several small settlements until the 1860s. There is a history of whaling and a long tortuous history of trying to keep the port of Invercargill open for small ships until we finally gave up in about 1937. Reclamation, rubbish dumping and dredging have changed the nature of the estuary permanently but it remains as a recreational asset and a feeding and nesting area for birds.



Renee Johansen (Manaaki Whenua Landcare Research)

Hidden complexity: fungal communities in the roots of sand dune grasses

The roots of sand dune grasses host complex fungal communities. DNA sequencing technology can help reveal which species are present. We can then start to understand the environmental controls over fungal community composition. For this PhD project, I studied fungi in the roots of marram grass (*Ammophila arenaria*) in dunes in New Zealand, Australia, the United States and the United Kingdom. I also studied fungi in co-occurring native grasses - in NZ, I studied fungi in the roots of *Spinifex sericeus*. While the overall communities in dunes were different in different places, many fungi were found in many places. There was high spatial variation within dunes, suggesting lots of samples are needed to obtain an accurate picture

of community composition. Plant species identity also impacted fungal communities, but the differences were subtle. Marram grass contains rich fungal communities in NZ, but I would suggest long-term impacts of the plant on spinifex fungal communities, should marram grass be removed, would be minimal, as dominant species are shared between the plants. Many fungal lineages known to be pathogenic in some environments were found, but the plants sampled appeared healthy. This work represents the first steps in understanding the complex natural fungal communities in the roots of sand dunes.



Renee Johansen (Manaaki Whenua Landcare Research) *continued*

Beyond myrtle rust: towards ecosystem resilience

The fungus which causes myrtle rust (*Austropuccinia psidii*) arrived in New Zealand via the wind in 2017. It threatens many ecologically, culturally and economically important plant species in the Myrtaceae family, including those important in coastal ecosystems, such as pōhutukawa and mānuka. Myrtle rust strikes plants at all life stages, causing dieback and potentially death. In Australia, where the fungus has been present for a decade, several plants are now threatened with extinction. Myrtle rust will not be eradicated from New Zealand, so it is vital we learn how to increase ecosystem resilience to the disease, and help local communities protect our taonga trees. In this talk, I will share key early research findings about myrtle rust. I will then introduce the research programme 'Beyond Myrtle Rust'. This multi-year, multi-agency programme has multiple interlinking research areas. Through these, we aim to understand the behaviour of the pathogen in NZ, understand disease impacts on ecosystems, develop mitigation strategies and control tools, and to work with iwi to empower kaitiaki. We also aim to work collaboratively with other research programmes and stakeholders.



Jim Dahm, Coastal Scientist, Eco Nomos Ltd

Managing Coastal Squeeze by Coastal Restoration and by Living and Working with Nature

Historically, many coastal margin ecosystems in both NZ and elsewhere have been seriously degraded by coastal squeeze, human activities encroaching too far seaward. Around estuaries, this has resulted in huge losses of coastal and estuarine wetlands; particularly upper-intertidal ecosystems (e.g. naturally vegetated riparian margins, saltmarsh). On beaches, coastal dunelands have been extensively lost or modified and the seaward encroachment has also given rise to so-called "coastal hazard problems". Traditionally, these hazards issues have been managed using hard engineering (e.g. sea walls), resulting in further beach loss

and degradation.

In the longer term, projected sea-level rise is expected to lead to landward retreat of many coastal ecosystems (e.g. estuarine wetlands, beaches), seriously exacerbating loss and damage as ecosystems are increasingly squeezed between encroaching human activities and a retreating coast.

World-wide, these existing and potential future issues have given rise to an increasing emphasis on coastal restoration and on living and working with nature in an attempt to prevent and reverse ecosystem loss. This presentation provides a brief overview of some of the key tools available to protect and restore coastal ecosystems with examples; including ecosystem creation, various coastal restoration activities, living with natural processes, setbacks and development controls, managed realignment and managed retreat. Collectively, these and other approaches provide a powerful tool-kit with considerable potential, even though work in NZ to date is really only at an early stage.

Opportunities for use of these various tools on the Southland coast will be further discussed in the field trips.

Jim is an applied coastal scientist who has been involved in studying and working with coasts since the mid 1970s, including successively university studies and contracts, the Ministry of Works, Waikato Regional Council and as a consultant. Over the last 30 years, he has worked primarily with coastal restoration in estuarine and beach environments and with coastal hazards. Jim's practice places a strong emphasis on understanding and working with nature, community engagement and adaptive management. He has been involved with the Coastal Restoration Trust since its inception and is a former trustee.



Associate Professor Mike Hilton (University of Otago)

Foredune response to marram devegetation - Mason Bay, Rakiura National Park

Mike lectures at the University of Otago and has worked with the Department of Conservation on the Rakiura Dune Restoration Program since 1997. This program is the world's largest dune restoration program, which seeks to restore the dynamic character of dune systems invaded by marram grass and restore and safeguard active dune system biodiversity. During that time 25 theses and dissertations have been completed on aspects of the ecology, geomorphology and restoration of Stewart Island - Rakiura dune systems at the University of Otago. Mike is secretary and treasurer of the International Society for Aeolian Research (ISAR) and is interested in coastal landscapes shaped by aeolian processes. He has interests in the interpretation and classification of dune systems, aeolian processes in tropical environments, transgressive dune system dynamics, processes of dune restoration and the intersection of cultural and geomorphic landscapes.



Joyce Kolk - Fiordland and Stewart island Coastal clean-ups

First Coastal Clean started on the Southern Fiordland coast in 2012. This clean-up was completed under the umbrella of the South West Endangered Species trust.

Southern Coastal Charitable trust was formed in 2017 to help a group of dedicated people to raise funds and commit to carrying out coastal clean-ups along the Fiordland and Stewart Island coasts. To date the trust has removed 60 tonnes of rubbish off our should-be-pristine coast lines.



Ben Knight (Sustainable Coastlines)

The Litter Intelligence Programme

The Litter Intelligence Programme: Working with Citizen Scientists to Measure Beach Litter Flux in Aotearoa-New Zealand. Litter is a major risk to New Zealand's people, culture, environment and economy, especially when it enters the marine environment. However it is a problem that we can – and will – solve.

Working in collaboration with the Ministry for the Environment, Statistics NZ and the Department of Conservation, Sustainable Coastlines is designing and building a national litter database that portrays an accurate picture of our beach litter problem. To collect the data long-term, we have engaged with communities around Aotearoa, providing them with the training and tools required to take part in the project as 'Citizen Scientists', measuring beach litter flux and developing and monitoring the effectiveness of their local solutions to the growing global problem of marine litter.

By working to a United Nations Environment Program methodology, data will be collected at the highest standard of scientific rigor, enabling Citizen Scientists, for the first time in a New Zealand context, to contribute Tier 1 data for use by the Government for national, regional and international reporting, including the Sustainable Development Goals.

Learn more about this programme and how Sustainable Coastlines works with communities and citizen scientists in providing decision makers with Tier 1 data that will inform evidence-based decisions to safeguard the future of our oceans.

Ben is an ocean champion who is committed to protecting and restoring our unique coastal and marine environments. He currently works as a Programmes Coordinator for Sustainable Coastlines. In this role Ben has been working as a part of a team to design and deliver a community based citizen science monitoring programme that enables local community groups and volunteers to collect scientifically robust beach litter data from coastal sites throughout Aotearoa NZ. Ben is also a founder and the chair of the Guardians of Kāpiti Marine Reserve Trust, a charitable community organisation that was established to provide community input into the management direction of Kāpiti Marine Reserve and to foster community pride and a sense of ownership for the local marine environment.





Lynne Huggins (Department of Conservation)

Marram Eradication along the Fiordland Coast

A programme to remove marram from the Fiordland Coast began in the mid 1990s From Big River to Port Craig. In the beginning the Argo and a portable spray unit was flown into locations such as Big River. The marram is now down to low levels and has been replaced by pingao.

Removing Spartina from New River Estuary

In 1988 a new programme of work was initiated in DOC Southland to clear the New River Estuary of approximately 800ha of spartina. This also included removing spartina from all other estuary's within Southland including the Catlins. Work has involved trials using different techniques and herbicides. Nowadays the most challenging issue we face is finding the last few remaining plants. Using a new technique, we are now finding those.



Cr Julie Keast (Southland District Council)

Julie has been elected by Waihopai Toetoe Ward since 2013

The love of Curio Bay and surrounds is in my DNA with both of my grand-fathers being involved in the Curio Bay Domain Board in the early days (1940-50s) continuing on with my mother who was the secretary for the South Catlins Charitable Trust for the past 16 years and still is a trustee. Many happy memories have been created here through holidays, picnics, swimming and exploring around the rocks.

The care and protection of this unique place to enable all species who visit to find their space a safe and rejuvenating spot is a priority for me, so I am looking forward to discussing the development and pressures for the area, along with the projects which are being undertaken to protect and enhance the Curio Bay Reserve.



Cr Paul Duffy (Southland District Council)

Paul represents the Waihopai Toetoe Ward on SDC, which incorporates the south eastern Southland coastal area.

He is also Chairman of the South Catlins Charitable Trust that, through a lease agreement with Southland District Council, manages the Curio Bay Reserve. The Trust built the Curioscape Visitor Centre which opened to the public in December 2017 with the aim of better management and education of the growing number of visitors, while providing economic and employment benefits to the local community.

The Trust, assisted by community volunteers, also carries out ongoing predator control at Curio Bay.

Paul is also a Trustee on Te Whakamana o te Waituna.

He is a semi-retired dairy farmer and was awarded an Environment Southland Community Award for Environmental Achievement in 2018 in recognition of the Curio Bay project.



Brian Rance (Department of Conservation)

I am an ecologist working for DOC based in Invercargill. I have worked Southern NZ for 30+ years and so have a strong knowledge of this areas. I have keen interest in coastal ecosystems including sand dunes, turf communities, wetlands and islands.

Southern Southland fieldtrip (19/3/2020)

Waipapa Point – Is notable for the 180million year old, Jurassic age petrified fossil forest and is home to NZ sealion, yellow-eyed penguin. We will visit the Timu Toka Curio Scape Centre run by the South Catlins Charitable Trust. The Trust also is actively involved with restoration and revegetation projects at Curio Bay.

Slope Point – Is the southern-most point in the South Island, with stunning coastal landscapes. There are fine examples of coastal turf vegetation on the exposed headland and adjacent is one of few areas where coastal forest still extends to the cliffs.

Waipapa Point – We will visit the lighthouse which was established following the shipwreck of the SS Tararua with the tragic loss of 131 lives. The Point is the home of NZ sealion, coastal turfs and rare plants.

Toetoes Harbour/Fortrose Spit – Toetoes Harbour is the estuary at the mouth of the Mataura River. Fortrose Spit separates the estuary from the sea and is one of the south coast beaches retaining sand dunes with intact native vegetation dominated by pingao and Raoulia cushion fields and containing several rare plant species. Both Toetoes harbor and Fortrose Spit are included in the extensive Awarua-Waituna Ramsar Wetland of International Importance.

Waituna Lagoon/Oreti Beach fieldtrip (20/3/2020)

Waituna Lagoon and wetlands – Waituna Lagoon is one of the best examples of an intermittently open and closed lagoon type in NZ. The Waituna Wetlands are one of the largest and most intact wetland systems in NZ. Both the lagoon and wetlands are included in NZ's first and largest Ramsar Wetland of International Importance.

New River Estuary/Sutton Lagoon and boardwalk – The Sutton Lagoon is a man-made lagoon which was created as part of the former Invercargill landfill. The former landfill site is now being restored by the Invercargill City Council. The Sutton walkway provides access around the Sutton Lagoon and to the New River Estuary. The New River Estuary is included in the extensive Awarua-Waituna Ramsar Wetland of International Importance.

Oreti Beach – Is Invercargill's beach. This extensive beach system extends from the mouth of the Aparima River to the mouth of the Oreti River. The fore dune is now dominated by marram grass. The area behind the beach is largely within the Sandy Point Recreation Reserve. Sandy Point has a wide range of recreational activities and sports clubs. It also has areas of plantation forest and native totara forest. The totara forest on ancient sand dunes is one of the largest and best remaining remnants of this rare ecosystem type.

Lyle Mason (Coastal Restoration Trust)

I farm 294 Ha with sheep and beef and have 2½ km of coastline on the eastern end of Foveaux Strait next to Waipapa Point Lighthouse. I'm a trustee on the board of the Coastal Restoration Trust.

Back in 1990 a blight killed the tree lupins. After they rotted down erosion of the sand dunes started with about 40ha covered in sand and fences buried to the top wires. By removing sand from the fences, planting marram grass and sowing rye, corn and grass we stabilised the dunes.

Katrina Robertson (Environment Southland)

An overview of work that has happened in the Waituna catchment and lagoon over the last ten years from a regional council perspective, including some lessons learnt

Gavin Gilder (Senior Policy Planner, Environment Southland)

Primary role is natural hazards risk mitigation. Last 8 years of the 24 years resource management work in Southland has been with Environment Southland with previous work in the private sector.

