

PROGRAMME



Braided Rivers Seminar

Lincoln University 10 July 2024

Time	Speakers	Topic
8.45am	Nick Ledgard	Introduction, housekeeping
9.00am	Gabrielle Huria	A year in the life of the Rakahuri
9.25am	Wendy Fox	Local movements of colony-based karoro/Southern black-backed gull
9.50am	Biz Bell & Samantha Ray	Understanding the impacts of kāhu (<i>Circus approximans</i>), an aerial predator, on tarapirohe/black fronted terns (<i>Chlidonias albobriatus</i>) and other braided river bird species
10.15am	Jaz Morris	Know your enemy: catchment-scale riverbed weed surveys to identify risks and prioritise actions
10.40am	Morning tea	
11.10am	Rachel Hufton & Anthony Coote	Makarora Braided River: spatial and temporal biodiversity distributions and interaction
11.35am	Emma Williams	Shorebirds – Connecting places and people to maximise New Zealand’s national conservation efforts
Midday	Helen Greenep	Developing a braided river monitoring programme to measure extent and condition
12.25pm	Warwick Allen	Impacts of Cyclone Gabrielle on Hawke’s Bay braided river habitat and wading birds
1.00pm	Lunch	
2.00pm	Nick Ledgard	Monthly bird surveys on Ashley-Rakahuri River: 2013-2023
2.25pm	Holly Harris	Embracing river variability: Conservation at a landscape scale
2.50pm	Tara Murray	Land-based invertebrate monitoring on Canterbury braided rivers
3.15pm	Grant Davey	Stories from a braided river
3.40pm	Afternoon tea	
4.10–5.10pm	Forum; open discussion. The lecture theatre will be open until 5.30pm if discussions continue.	

9.25am: Local movements of colony-based karoro/Southern black-backed gull

Karoro/Southern black-backed gull (SBBG) (*Larus dominicanus*) are a large, opportunistic native gull. Karoro/SBBG have successfully exploited anthropogenic activities and are considered 'super abundant' in Canterbury. Despite their size and abundance, little is known about their movements within the landscape, foraging preferences, and flying range. A pilot study was conducted in November 2022 with 10 transmitters deployed on karoro from colonies of the lower Hakatere/Ashburton River. The majority of foraging was within the surrounding farmland with variation between individuals and sexes. A small proportion of their time was spent off the coast. We have since increased to 40 birds with transmitters 2023-24 breeding season, with a total of 20 transmitters deployed on the lower Hakatere/Ashburton River and 20 transmitters deployed on the Waimakariri River. We will comment on preliminary findings of this larger data set.

About the speaker:

Wendy Fox is a PhD student (Lincoln University) whose research is centred around karoro/SBBG in Canterbury, analysing breeding success and their local movements. **Email:** wendyaefox@gmail.com

Notes



9.50am: Understanding the impacts of kāhu (*Circus approximans*), an aerial predator, on tarapirohe/black fronted terns (*Chlidonias albostratus*) and other braided river bird species.



Tarapirohe/black-fronted tern (*Chlidonias albostratus*), a nationally endangered New Zealand shorebird, have an estimated population between 1,000 and 5,000 mature individuals and a predicted 50% rate of decline over the next three decades. This ongoing decline is the result of interacting threats, including predation by introduced mammals, habitat loss and climate change. Additional threat from avian predators, specifically karoro/southern black-backed gulls (*Larus dominicanus*) and kāhu/Australasian swamp harriers (*Circus approximans*) has also been recorded during annual monitoring programmes. Understanding the level of threat by avian predators and whether this is a learned behaviour by individual birds or at population level is vital to enable suitable management options to be implemented.

About the speakers:

Biz Bell Managing Director (Wildlife Management International WMIL) A seabird and island restoration specialist working a range of ecological and conservation projects throughout New Zealand and around the world. As Managing Director of WMIL, Biz directs a team of passionate ecologists completing a variety of seabird and shorebird conservation projects for government and non-government agencies across New Zealand. Biz has undertaken long-term seabird and shorebird research projects over the past 30 years. She has banded tarapirohe adults and chicks as well as directing the kāhu banding project to determine impacts this species may have on tarapirohe. Biz is an invasive species eradication and control expert, having eradicated pest species from over a dozen islands around the world, and undertaken and directed long-term predator control operations in New Zealand. Biz provides technical advice to a number of Predator Free NZ projects across the country, and see the involvement of communities as vital for the long-term legacy of these, and other, conservation projects.

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Samantha Ray Operations Manager & Senior Ecologist (Wildlife Management International WMIL). As part of her role as Operations Manager, Samantha oversees all of the WMIL projects operating in New Zealand directing personnel in the field and office and managing all aspects of the projects. Sam is a seabird specialist, working on long-term seabird and shorebird research projects including toanui/flesh-footed shearwaters, tākoketai/black petrels and tarapirohe/black-fronted terns. Sam has managed the kāhu banding project to determine the impacts that this species may have on tarapirohe as part of the annual monitoring programmes that WMIL completes for DOC and ECan. Sam has also undertaken a range of predator monitoring and control programmes along braided rivers in northern Canterbury, as well as other locations across New Zealand.

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10.15am: Know your enemy: catchment-scale riverbed weed surveys to identify risks and prioritise actions

In the ongoing battle against the biodiversity weeds that threaten braided river habitats, collaborative cross-agency weed control programmes are holding the line and even making significant strides in catchments like the upper Rakaia and Rakitata. The wide braidplains of these awa are threatened by an even wider range of invasive weeds, which, once established, threaten the birds, lizards and invertebrates that thrive among naturally sparse, low stature, often literally overlooked, and yet superbly adapted native plant species left underappreciated by uninspiring names like ‘scabweed’. The upper catchments, along with the headwaters of the South Island’s other large, braided rivers, are typically managed by various entities: the Department of Conservation, Crown Pastoral Lease lessees, and Toitū Te Whenua Land Information New Zealand. Yet, weeds consistently fail to recognise cadastral boundaries, and many remain unmanaged due to Regional Pest Management Plans (RPMPs) and other policies that collectively lag behind emerging threats and that often prioritise pasture nuisances or lost causes over serious yet manageable weed infestations. In this context, the cross-agency programmes are most effective when they work ‘beyond the RPMP,’ controlling additional weed species to benefit vast areas. My talk will delve into the lessons learned at a catchment-scale perspective, where biodiversity weeds are surveyed and controlled via multi-year programmes. We’ll share the progress made over the past decade in safeguarding some of New Zealand’s most ecologically important braided river headwaters and discuss some of the likely challenges in the years ahead.

About the speaker:

Dr Jaz Morris, (Boffa Miskell) is an ecologist based in Christchurch who specialises in terrestrial ecology and botanical survey. Jaz frequently works alongside land managers and Boffa Miskell’s biosecurity consultant team to identify and prioritise pest plant issues. He is passionate about realistic, effective and appropriate control approaches to tackle weeds and to enable ecological restoration and protection of indigenous habitats.

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Notes



10.40am: Break for Morning Tea. Please return to your seats by 11am

11.10am: Makarora Braided River: spatial and temporal biodiversity distributions and interactions

Since its inception in late 2017, Aspiring Biodiversity Trust (ABT) has observed and recorded changes in the distribution and geometry of channels and gravel bars over a 20-kilometre length of the Makarora braided river. Correlations are made between changes in Makarora braided river channel and bar distribution/morphology, and weather events. Over the same time period, ABT has observed and recorded continuities and variations in the distribution of protected/endangered avifauna species territories and breeding/nesting sites, as they relate to the dynamics of the changing braided river system.

About the speakers:

Rachel Hufton, Project Manager and Co-founding trustee of Aspiring Biodiversity Trust (ABT): Rachel is a professional ecologist and ornithologist, originally from UK, New Zealand has been home for the last nine years. Her current focus is the Makarora Catchment Threatened Species Project – From Ridge To River. A partnership project centred on four focal habitats and the threatened species they support; braided river for wrybill, black-fronted tern, banded dotterel, black-billed gull, beech/ podocarp forest for kaka and long-tailed bat, upper river catchments for whio and the alpine environment for rock wren and kea. She has over 22 years' experience within the environmental management sector and has worked as an environmental consultant focused on protected species, a local government ecologist safeguarding biodiversity on a county level and as an ornithologist on international conservation projects **Email:** rlhufton@gmail.com

Anthony Coote Chair, Aspiring Biodiversity Trust (ABT): Anthony is a professional geo-scientist and contributes to indigenous biodiversity protection and restoration programmes within the Makarora catchment. Anthony is actively involved in the management of logistics and safety in relation to braided river to alpine species surveying/monitoring and predator control field programmes. Anthony has adapted his earth/strategic-metals- resource science vocation skills to the planning and execution of ABT's multiple habitat and species protection and monitoring projects. As a geo-scientist he provides specialist technical input into the delineation of metals in the Earth's crust, many of these metals increasingly strategic and indispensable to expanding sustainable energy generation and consumption. **Email:** anthony@aps.co.nz

Notes



11.35am: Shorebirds – Connecting places and people to maximise New Zealand’s national conservation efforts

In New Zealand, conservation management efforts for threatened species largely concentrate on the protection of individual sites and reserves, with a focus on plantings and predator control. Yet, 57% of threatened bird species spend at least part of their life cycle outside of New Zealand’s protected area network, at sites with varying levels of protection. Little is known about: a) how to maximise the efficiency of local conservation management projects so that they also contribute to national conservation efforts, b) how different sites are linked throughout the annual cycle, or c) how best to protect additional threats such as those to stopover sites and flyways. BirdsNZ, the Department of Conservation and Manaaki Whenua – Landcare Research, together with other partners, have established a research partnership to address these knowledge gaps for shorebirds. To date we have been tagging and tracking tōrea/South Island pied oystercatcher, tarapirohe/black-fronted tern and pohowera/banded dotterel. This presentation provides a summary of what has been learned to date via all of these projects.

About the speaker:

Emma Williams, Science Advisor (Department of Conservation) leads the Department's Mobile Terrestrial Threatened Species Workstream. Emma work on highly mobile threatened species, includes several braided riverbed bird species, such as banded dotterels, black-fronted terns, South Island pied oystercatchers and wrybills. Her projects are often holistic and collaborative in nature because of the landscape scale movements of the species she works on. She has also done 12 + years work on wetland birds, including the Australasian bittern, spotless cakes and marsh crakes. **Email:** emwilliams@doc.govt.nz

Notes



Midday: Developing a braided river monitoring programme to measure extent and condition

Environment Canterbury are contemplating implementing a regional terrestrial biodiversity monitoring programme. One focus is on naturally uncommon ecosystems. With braided rivers being a key Naturally Uncommon Ecosystem in Canterbury, we decided to develop a monitoring programme that includes extent and condition of the terrestrial component of braided rivers. The first step was to determine extent. NIWA had been working on developing a methodology to determine the 'braidplain', and we are using the topographic braidplain – determined primarily using LiDAR – as the best representation of braided river extent.

With help from Susan Wiser (Manaaki Whenua Landcare Research) and Justyna Giejsztowt (Wildland Consultants) we came up with a methodology to monitor condition. This involved choosing 200m long 'reaches' ranging from the coast to as far up the river as possible. Within each reach vegetation structure/habitats were mapped using the most recent aerial imagery, and then vegetation plots were placed within each habitat type.

So far two rivers (Ashburton/Hakatere and Rakitata) have been surveyed as we develop and refine the methodology.

About the speaker:

Helen Greenep (Environment Canterbury) has a range of ecological interests including braided rivers, drylands, and wetlands. Her main focus is vegetation and habitats, and she is particularly interested in the dynamic nature of braided rivers and the habitat mosaic that produces. Human activities have had a severe impact on the ecological functioning of braided rivers and one of Helen's interests is how to restore some that natural dynamism and mosaic into constrained braided river ecosystems. **Email:** helen.greenep@ecan.govt.nz

Notes

12.25pm: Impacts of Cyclone Gabrielle on Hawke’s Bay braided river habitat and wading birds

Braided rivers are naturally uncommon ecosystems that face many threats, including extreme weather events. Systematic surveys between 2019 and 2021 revealed that Hawke’s Bay braided rivers support around 15% of the global breeding population of pohowera (banded dotterel, *Charadrius bicinctus*), 50% of the national population of black-fronted dotterel (*Euseyornis melanops*), 5% of the national population of poaka (pied stilt, *Himantopus himantopus*), and the only North Island breeding population of tōrea (South Island pied oystercatcher, *Haematopus finschi*). In February 2023, Cyclone Gabrielle struck the North Island of Aotearoa New Zealand, causing widespread devastation. To assess how Cyclone Gabrielle altered Hawke’s Bay braided river habitat and wading bird populations, we resurveyed 292 km of braided river in spring of 2023. Cyclone Gabrielle was associated with decreased population sizes of pohowera (21% decline), black-fronted dotterel (27%), poaka (18%), and South Island pied oystercatcher (73%), although the severity of impacts varied among catchments. Compared to pre-cyclone levels, vegetation cover was 75% lower and substrate composition shifted towards finer size classes (silt and sand), with some of these habitat variables linked to changes in wading bird density. Our findings highlight the severity of ecological impacts associated with extreme weather events, the utility of high-quality monitoring data, and the urgent need for research that tracks post-disturbance recovery of braided river ecosystems.

About the speaker:

Warwick Allen (Manaaki Whenua – Landcare Research) is a community ecologist based in Ōtautahi Christchurch. His research interests are wide-ranging but grounded in a desire to understand and mitigate the impacts of global change on indigenous ecosystems and species. In his spare time, you might find Warwick birding around Ōtautahi or enjoying other outdoor adventures. **Email:** AllenW@landcareresearch.co.nz

Notes

1.00pm: Break for lunch. Please return to your seats by 1.55pm



2.00pm: Monthly bird surveys on Ashley-Rakahuri river, 2013-2023

Between May 2013 and December 2023, the author undertook monthly surveys of a 1.8km section of the Ashley Rakahuri River for bird species and total numbers. Results divided species into *core* species - wrybill (ngutupare), black-fronted tern (tarapirohe), black-billed gull (tarapuka), banded dotterel (turiwhatu), pied stilt (poaka) and S. Island pied oystercatcher (torea) - and *other* species (13 of them), and focused on comparisons between winter and summer months. During the summer period there were considerably more *core* species present than in winter, compared to little change in *other* species. In order to compare changes over time, the study was divided into two periods – the first 5 years (2013-2017) and the last 5 years (2019-2023). During winter, there was a small increase over time in number of *core* species with a larger increase in total numbers, whereas there was no increase over time during the summer. The tarapirohe was the most consistently seen core species over winter (although only in small numbers), with a suggestion of increasing presence of poaka and turiwhatu. Relative to *other* species over time, there was an increase during the winter months in both number of species and total birds, whereas in the summer, there was no increase in the number of species but there was an increase in total numbers. The two important conclusions from the study are the major difference in number of *core* species and their total numbers between winter (less) and summer (more) compared to little difference in *other* species, and the increase over time in both *core* and *other* species observed during winter. Does this indicate warming winters?

About the speaker:

Nick Ledgard, (Ashley Rakahuri Rivercare Group and BRaid), is a retired forestry researcher (Scion/NZFRI) returning to ornithological roots put out as a youngster. He is a long-time OSNZ member. Currently, he spends most of his time trying to improve the lot of native birds on braided rivers (particularly on the Ashley-Rakahuri River) and pursuing his interests in farm forestry and wilding trees. **Email:** nick.ledgard@xtra.co.nz

Notes



2.25pm: Embracing river variability: Conservation at a landscape scale

Braided rivers are naturally diverse and highly variable in nature. The unstable river bed is constantly forming and reforming channels across a braidplain. Despite this highly unstable physical environment the species we see on the rivers remain, creating a stable-yet-disturbed paradox.

To understand how biodiversity remains stable through time on a braided river despite continuous change, I sampled birds, fish, and invertebrates on the Cass River (Tekapo) from September 2021 to August 2023. Using stable isotope analysis, I identified how black-fronted terns, wrybill, banded dotterel, kōaro, and bullies feed across the braidplain and how they connect these different habitats through movement.

I then sampled invertebrate in five different channel habitat types across the river along four transects every two months. I also sampled fish every four months in these same channels and ran bird counts and territory mapping twice in the summer. I used terrestrial invertebrate samples from pitfall and malaise traps collected every month from November to February for three summers.

These data show that when we look at one site on a braided river the biodiversity can seem unstable and variable. However, when we incorporate the variability of species and resources in many habitat types and across time, we see a broader pattern emerge: total resource availability and biodiversity is more stable. Species that use and connect these resources such as banded dotterels and kōaro rely on the variability in space and time of different areas in the river for a stable food supply. This is important as when we remove habitat and species connectivity from a braided river through land encroachment, weed invasion, and water abstraction, we increase the total variability of food sources for valued biodiversity. Variable food sources and loss of connectivity create vulnerable species. For example, extreme flooding can remove all remaining food sources in one event leaving.



About the speaker

Holly Harris (University of Canterbury) is researching on the Cass River in Tekapo for her doctorate. With a bit of experience in freshwater and terrestrial biomonitoring, she is now interested in how braided rivers work as whole ecosystems to support the life that exists within them, such as the birds and fish that we know and love.

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Notes

2.50pm: Land-based invertebrate monitoring on Canterbury braided rivers

Invertebrates make up a significant proportion of all biodiversity in braided river habitats. They are innately important, with extremely high levels of endemism, but also have a range of ecological functions including being an important food source for fish as well as native birds that feed both on land and in the water. Standardised methods for measuring and monitoring invertebrate diversity are almost entirely limited to the aquatic parts of these ecosystems and therefore restricted to a discrete subset of the community. To expand our understanding to encompass other habitats within a braidplain, we sampled invertebrates using land-based techniques (pitfall and malaise traps) on two Canterbury Rivers, the lowland Ashley Rakahuri and the upland Cass River near Lake Tekapo. Sampling was undertaken repeatedly over 4 summers to understand the spatial and temporal variation in catches that can be expected using these methods. Over 700 species were identified from the Ashley and 533 from the Cass, but because sampling effort was double on the Ashley diversity is predicted to be slightly higher on the Cass overall. In this presentation we explore the characteristics of these invertebrate communities and look at the pros and cons of different levels of sampling using these land-based methods.

About the speaker:

Tara Murray (Department of Conservation) is based in Dunedin as a Science Advisor | Kaitiaki Pūtaiao in DOC's Terrestrial Science Unit. Her work with terrestrial insects over 20+ years has included biosecurity, biodiversity, ecology and behaviour, climate change, monitoring, and insect conservation. Tara graduated with an honours degree from Otago University, studying native grassland weevils, followed by an MSc in Massachusetts, a PhD with Forest Research in Rotorua, and a postdoc at the Hawkesbury Institute for the Environment in Western Sydney. Tara was a senior lecturer at Canterbury University for 9 years, during which time she started working on the Robust grasshopper, before joining DOC in 2019. She is also vice president of the New Zealand Entomological Society.

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Notes



3.15pm: Stories from a braided river

This presentation is a slideshow with the aim of illustrating some of what happens on the Ashley River/Rakahuri during a nesting season. Some of these photographic stories show bird behaviour; others touch on important issues such as bird disturbance, the Norway rat problem, and measures to address these.

About the speaker

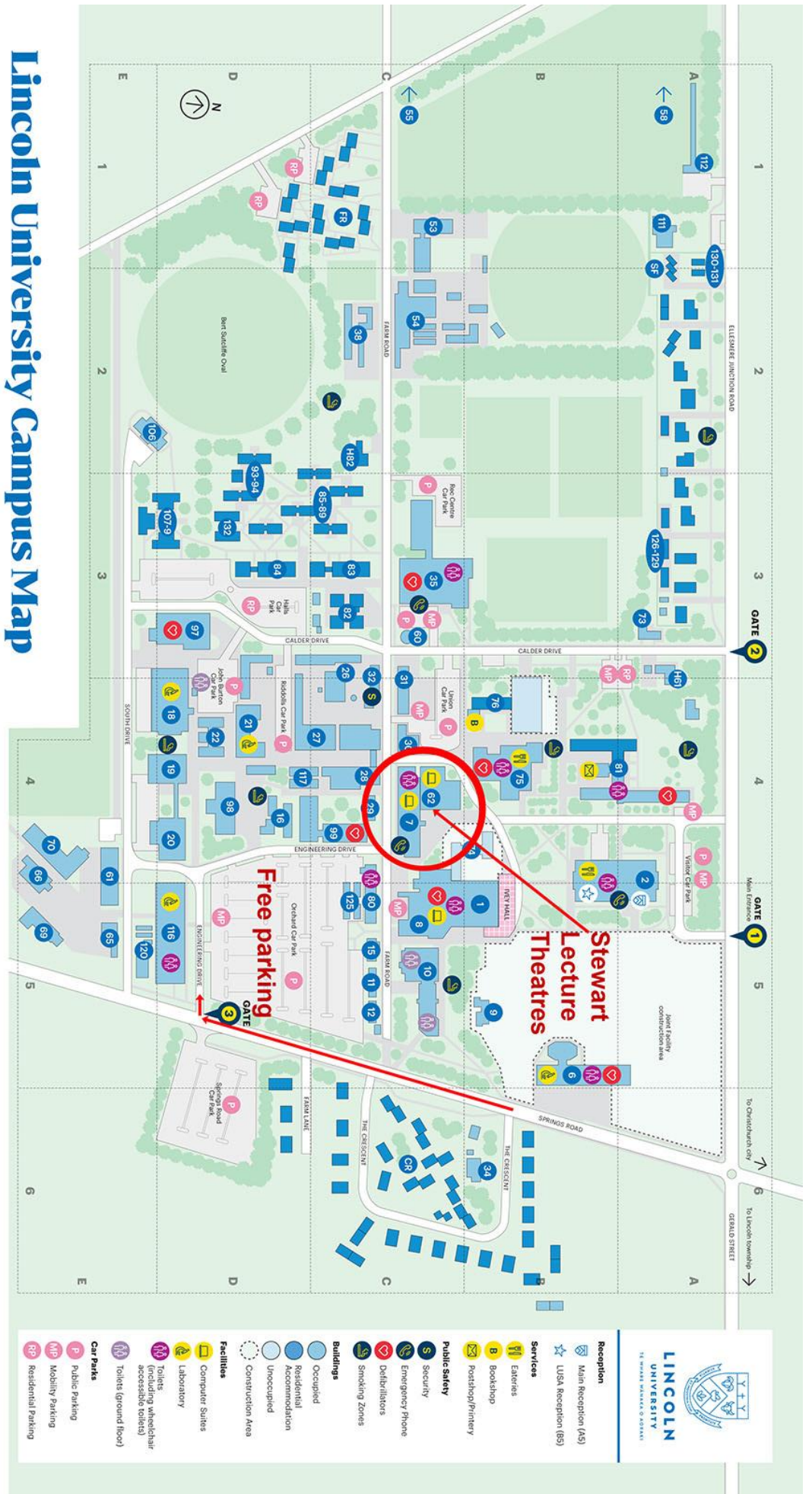
Grant Davey (Ashley Rakahuri Rivercare Group) has been a mineral exploration geologist in six countries and was a hydrogeologist at Environment Canterbury for four years. He has a PGDip in Environmental Science. For about six years he's been an active member of the Ashley Rakahuri Rivercare Group and BRaid. **Email:** grdavey@yahoo.com

Notes



3.40pm: Break for afternoon tea. Please return to your seats by 4.05pm

Lincoln University Campus Map



Building Name	Building Number
Accommodation Office	H82 C2
Accommodation Office	85-89 C3
Central Hall	31 C4
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