NEW ZEALAND ECOLOGICAL SOCIETY

Newsletter

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Contents

From the Editor

Kia ora koutou,

I hope you are enjoying a good end to 2022, and here is your 181th NZES newsletter, just in time for the summer holidays!

This newsletter begins with a few updates from the NZES: News from the Council, introduction to our new councillor, notes from the journal editor of the NZ Journal of Ecology, and information about our NZES karakia. The newsletter also contains notices about upcoming conferences and scholarship opportunities, as well as Ecotones and Illustrated Ecology.

This will be my last newsletter as the NZES newsletter editor. It's been such a pleasure to get to know you through the newsletter, and of course I couldn't have made the newsletters without all of your fantastic contributions. Thank you!

Meri kirihimete!
Rowan

News from NZES Council

Kia ora koutou

NZES held its first in-person conference in three years in Dunedin in late November/early December. The conference was a great success, with 14 symposia and over 300 delegates registered. There was a palpable atmosphere of excitement as participants enjoyed the opportunity to meet face-to-face after so long. I'd like to thank the local organising committee, led by Yolanda van Heezik at University of Otago and supported by Conferences and Events, for putting together a fantastic event.

While these in-person meetings are clearly important and valued by our members, in 2023 the NZES Council is considering holding simultaneous regional events, combined with a virtual AGM and Te Tohu Taiao plenary talk, instead of an in-person conference. The aims are to reduce carbon emissions and conference registration costs, and enhance inclusivity. If you would be interested in helping to organise a local event in your area or a student event, please get in touch.

I'd like to welcome our new Councillor Fleur Maseyk, who was elected at the 2022 AGM. We are delighted to have Fleur return to an official role on Council following a few years' break. Our Newsletter Editor Rowan Sprague will be stepping down after three years in the role. I'd like to thank Rowan for her contribution and for producing so many fantastic issues of the Newsletter. Tom Carlin will be taking over as Newsletter Editor from 2023.

The NZES has achieved a major milestone this year in moving the NZ Journal of Ecology to fully Open Access. I'd like to thank our Journal Editor Tom Etherington for his efforts over the past year to make this

happen. In other work, we are currently preparing a submission from NZES on the Natural and Built Environment Bill. Please get in touch with Fleur Maseyk if you would like to contribute (you will make Fleur's week – or possibly year?? – if you offer to help!).

Next year will be a busy one for the NZES Council, with our Strategy due for review. Simon Moore will lead the review with assistance from a Council subcommittee. A draft Strategy will be circulated to members for comment, and I encourage you to provide feedback. We will also need to start updating the Society's rules and procedures as a result of the new Incorporated Societies Act 2022, although we have until April 2026 to comply.

I wish you all a safe and relaxing holiday season.

Tēnā koutou, tēnā koutou, tēnā tātou katoa.

Debra Wotton
President

Introduction to our new NZES Councillor: Fleur Maseyk

Fleur Maseyk was recently elected to the NZES Council, although this is not her first time as an NZES Councillor. She was a councillor from 2015–2017 and 2007–2013, and also did a stint as newsletter editor (2007–2010). Below is a quick introduction to her – welcome Fleur!

Fleur works as a Conservation Scientist with The Catalyst Group, a multi-disciplinary team bringing together planning, policy, land management, iwi rights and interests, and ecological science in response to natural resource management and conservation challenges. She works at the interface of policy and science on a daily basis and considers herself extremely fortunate to be able to work across the spectrum from theoretical, strategic, and policy levels to the realities of on-the-ground implementation on a variety of projects and a range of clients; no two weeks are the same. Her areas of expertise include natural capital and ecosystem service

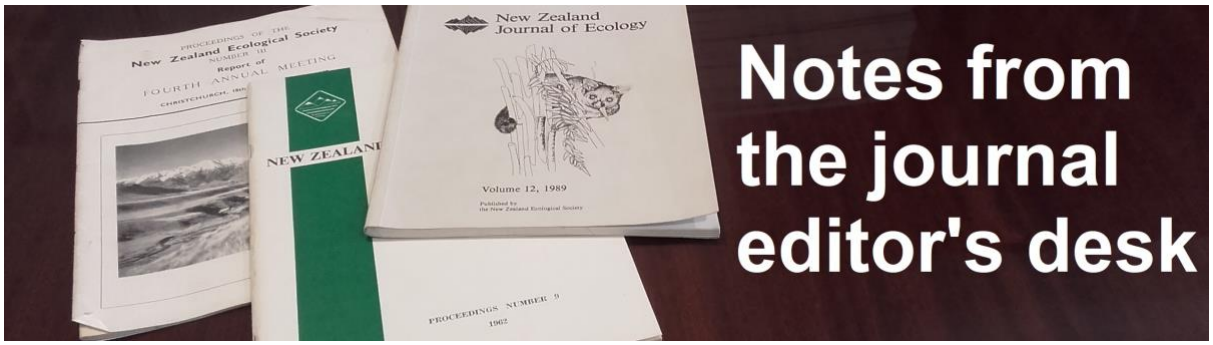
approaches to natural resource management, biodiversity policy, biodiversity offsetting theory, policy, and implementation, and farm planning to integrate biodiversity into production landscapes.

Fleur says that it was probably David Attenborough's fault that she became interested in ecology. She says that, "Understanding the natural world and how people interact and influence it is crucial for making more informed (and hopefully better!) natural resource management and conservation decisions. Also, ecology is just endlessly fascinating."

When asked to share something that we might not know about her, Fleur says, "Well, despite a life time of practice I still have an inherent ability to get stuck in extremely awkward positions when climbing over, through, or under fences."

Wonderful to have you on the NZES Council again, Fleur!

Notes from the Journal Editor's Desk



When to waive goodbye to page charges

One of the society's goals is promote ecological communication, and it does that by funding part of the cost of publishing the New Zealand Journal of Ecology to keep page charges as low as possible. So, in comparison to many other open access journals the New Zealand Journal of Ecology provides a very low-cost option. A 10-page open access article in New Zealand Journal of Ecology would cost $400 as opposed to an article publishing charge (APC) of over $5000 to publish openly in the New Zealand Journal of Botany and the New Zealand Journal of Zoology published by the Royal Society Te Apārangi. As well as partly funding all papers, the society also offers a discount for members, that reduces the cost for a 10-page open access article for a member to $250.

However, there may still be occasions when even that cost may cause some members problems. We're currently experiencing significant cost of living increases, and for unwaged members it is possible that a few

hundred dollars could be a significant expense, and hence the journal may be excluding some members from being able to publish in their journal. Clearly this is not in line with the objectives of the society.

While I would love to be able to allow members to publish for free, we do need to ensure that we receive enough revenue to maintain the journal's existence. It's also worth noting that there are other options for ecological research that provide diamond open access publishing at no cost, such as Web Ecology where I have published myself recently. So, it is not as if there aren't other open access options ecological researchers can pursue beyond the New Zealand Journal of Ecology, and of course there is still the option to publish for free in many paywalled ecological journals.

So, what to do? The society has developed a new policy that where the lead author of a paper is a member of the society, and no funds are available via any members of the authorship team, then the society will waive page charges to try and avoid excluding any individual member from publishing within the journal. Full details of this new policy can now be found on the journal's website. This policy will be reviewed on a regular basis to assess if it is striking an appropriate balance between facilitating publication and ensuring financial stability.

Any compliments and complaints about the journal are always welcome at nzjecol.editor@gmail.com be it on this topic or any other.

Tom Etherington
Scientific Editor, New Zealand Journal of Ecology

NZES Karakia

You may have noticed that we started our NZES AGM this year with our NZES karakia. Karakia are traditionally used to clear space for important tasks or challenges and are often connected to practices involving tapu (sacredness) and noa (normalness) i.e., pōwhiri or wānanga. Beginning and ending hui with karakia is a way to bring focus to a kaupapa (topic) and safely end work matters or sensitive topics. In the context of NZES, it is appropriate begin and end important agenda with karakia.

Symon Palmer, NZES Councillor, sought advice from Dr. Mike Ross (*Imagining Decolonisation* team member) to compose a karakia specific to the kaupapa of NZES. The result is a contemporary karakia that acknowledges the environment which is at the heart of the Society and its members. This karakia can be used to open or close NZES Kaupapa, such as our AGM or Council meetings.

NZES Karakia
Nā Mike Ross

Ka rongo te pō ka rongo te ao Ko Rangi e tū nei ko Papa e takoto nei ko tātou i te taiao Ka tupu ake te pono i te whenua ka titiro ake te tika i te rangi Mauri ora ki a tātou	Acknowledgements to the realms of day and night Acknowledgements to the realms of Earth and sky And all of us who occupy the natural world From the land we can find reason In the sky we can find justice Health and wellbeing to us all

Seeking information about karaka in your area

Kia ora koutou,

My name is Kate McAlpine and I'm a weed ecologist at the Department of Conservation. One of my current projects is leading a collaborative paper that brings together all the different perspectives on karaka. This came out of a wānanga that was held at Zealandia recently: https://www.visitzealandia.com/Whats-On/ArtMID/1150/ArticleID/429/Weed-poison-or-native-taonga-the-great-karaka-debate

One of the things we'd like to include in the paper is a comprehensive summary of who is (or isn't) managing karaka around NZ. Things we'd like to know are:

1. Is karaka present in your area? If yes, then:
2. Please define your area, and describe how widespread karaka is, and what sort of land it occurs on (e.g. DOC land, council land, restoration site, private farmland etc.)
3. Are you aware if anyone manages karaka at any of those sites (including controlling it or planting it)?
4. Do you know what their reasons are for managing/not managing karaka?
5. Anything else you'd like to add?

If you'd like to contribute, please email your responses to me at kmcalpine@doc.govt.nz.

Ngā mihi nui,
Kate

Ecology PhD Scholarship Opportunity in Australia

The Rader Community Ecology Lab is advertising a new PhD scholarship for students interested in the role of flower strips in attracting birds, bats and insects to blueberry farms. This PhD scholarship ("The role of inter-row floral strips in supporting pollination and pest control services provided by birds, bats and insects to commercial orchards in New South Wales") is open to all applicants interested in vertebrate or invertebrate taxa and the important pollination or pest control roles they play in agroecosystems. This PhD project will be based in Coffs Harbour region of Australia.

See advertisement here for more information.

Illustrate Ecology

John Flux

"Apart from the apparently innate ability of starlings to avoid cars, some species are able to learn. This is clearly demonstrated by about 20 red-billed gulls (*Larus novaehollandiae*) fed from cars in Waterloo, Lower Hutt [image above]. At this busy intersection, they look carefully before crossing the road and make use of 'islands' where they are safe from vehicles driving at up to 50 kph. Only two were found hit by cars in the past five years".

From "Road-kills in New Zealand: Long-term effects track population

changes and reveal colour blindness”
https://journals.ku.edu/EuroJEcol/article/view/18567

Ecotones – New ecological research

Bruce Burns, University of Auckland

A selection of recently published research on or relevant to New Zealand ecology (except that published in the New Zealand Journal of Ecology). The list of other publications on New Zealand ecology can be found towards the end of the newsletter.

1. Biting mosquitoes expanding southwards

It’s that time of year when my sleep routine is sometimes (often?) disrupted by the tortuous low drone of a mosquito in my bedroom looking for a blood feast. Sound familiar? The mosquito involved is likely one of two introduced species: *Culex quinquefasciatus* or *Aedes notoscriptus*. Other than these, New Zealand has one other introduced species and 13 endemic species. Although these other 14 species occasionally bite humans, they specialise mostly on bird hosts (Te Papa Tongarewa 2022). Both the two main introduced biting mosquitoes mentioned earlier probably arrived in New Zealand on ships and have largely been confined until now to northern and central New Zealand. As well as being annoying, these two species are known as vectors of certain diseases overseas, so could act as transmission pathways should (or when?) these diseases arrive. The distribution of mosquitoes in New Zealand is monitored by the National Mosquito Surveillance programme that samples mosquitoes around international ports, mostly to pick up any new species that might arrive. Recently, Kasper et al. (2022) analysed data from this programme over 2005 – 2020 to identify changes in species distributions and abundance focussing on the introduced *Culex quinquefasciatus* and the endemic *C. pervigilans*. They found that *C. quinquefasciatus* is clearly increasing in both distribution (moving southwards) and population density over time. *C. pervigilans* populations also seem to be increasing but at a much lower rate. Worryingly, risks of disease impacts associated with mosquitoes are therefore increasing. As well, it looks like my chances of uninterrupted sleep won’t improve soon!

Kasper J, Tomotani B, Hovius A, McIntyre M, Musicante M 2022. Changing distributions of the cosmopolitan mosquito species *Culex quinquefasciatus* Say and endemic *Cx. pervigilans* Bergroth (Diptera: Culicidae) in New Zealand. New Zealand Journal of Zoology in press.

Te Papa Tongarewa 2022. Which species of mosquito in New Zealand bite? Te Papa Tongarewa https://www.tepapa.govt.nz/discover-

collections/read-watch-play/science-and-nature/spiders-and-insects/new-zealand-mosquito-1, accessed December 2022.

Culex quinquefasciatus Image source: Zoologist123 via iNaturalist (CC by NC 4.0)

2. Invasive mammals in cities

Because many invasive predatory mammals are nocturnal and cryptic, the ecology of these cohabitants with us in New Zealand cities is unexpectedly poorly known. Within urban areas, interest in increasing native biodiversity (e.g., www.songbird.org.nz, www.pfw.org.nz) has stimulated a need to understand the distribution and abundance of these invasive mammals. To fill this gap, Miller et al. (2022) report results of surveys of pest mammals (focussing on rats, mice, hedgehogs and brushtail possums) conducted in Hamilton, Wellington and Dunedin in spring 2017 and autumn 2018. These surveys were located in three different types of urban greenspace in each city and used several types of detection device. All pest mammals were found in all cities and all greenspace types in the survey, showing how pervasive these species are. Each of the species, however, differed in when and where they were most frequently detected. Rats had higher detections in the autumn survey, and in forest fragments and residential gardens near these forest fragments. They also were often

associated with residential gardens with compost. In comparison, hedgehogs had higher detections in the spring survey, but were detected least in forest fragments, preferring other types of urban greenspace. This analysis provides highly valuable information to help design nuanced control operations for these species in New Zealand cities. However, it also indicates that such control will have to be widespread and cover both public and private land so will continue to be challenging.

Miller KF, Wilson DJ, Hartley S, Innes JG, Fitzgerald NB, Miller P, van Heezik Y 2022. Invasive urban mammalian predators: distribution and multi-scale habitat selection. Biology 11 (10): art. no. 1527.

Hedgehog (*Erinaceus europaeus*) in Wellington Image source: Tony Wills (CC by-SA 3.0)

3. The high value of unlogged trees

Much of the remaining old-growth native forest in New Zealand on public land is now protected for conservation, but this was not always the case. Only a few decades ago, logging of old-growth forest was deemed an economically reasonable proposition even when conservation values were being lost. This was particularly true at Pureora Forest in the central North

Island, where some of the last major indigenous logging by the New Zealand government was undertaken. Carolyn King (2023) has written a fascinating story of the turbulent history that occurred at Pureora during the transition from timber exploitation to conservation hotspot and compared the economics of landuse then and now. She describes the major conservation battle that occurred at Pureora in 1978/1979 to stop old-growth logging and protect kōkako habitat, culminating in tree-top protests. Proponents of continued logging based their arguments on the short-term economic and social disruption an end of logging would cause, the need to meet existing contractual commitments with logging companies, and on the assumption that conserved standing forest had no value. Despite this resistance, the government ended logging at this time, with around 70 jobs lost, and compensation paid to the logging companies affected of $7.1 million. Although the short-term social cost was undoubtedly high for the rural communities affected, King (2023) then shows how the Pureora forest was reconfigured afterwards for a life centred on conservation and recreation. Not least amongst this reworking was development of the Timber Trail (www.thetimbertrail.nz), a walking and cycling track based on an old timber tramway and opened in 2013. Economic and social benefits of this new Pureora now clearly far exceed the benefits that were being delivered by logging and are sustainable. This story has important lessons on the inherent and often unappreciated value of biodiversity that we should not forget.

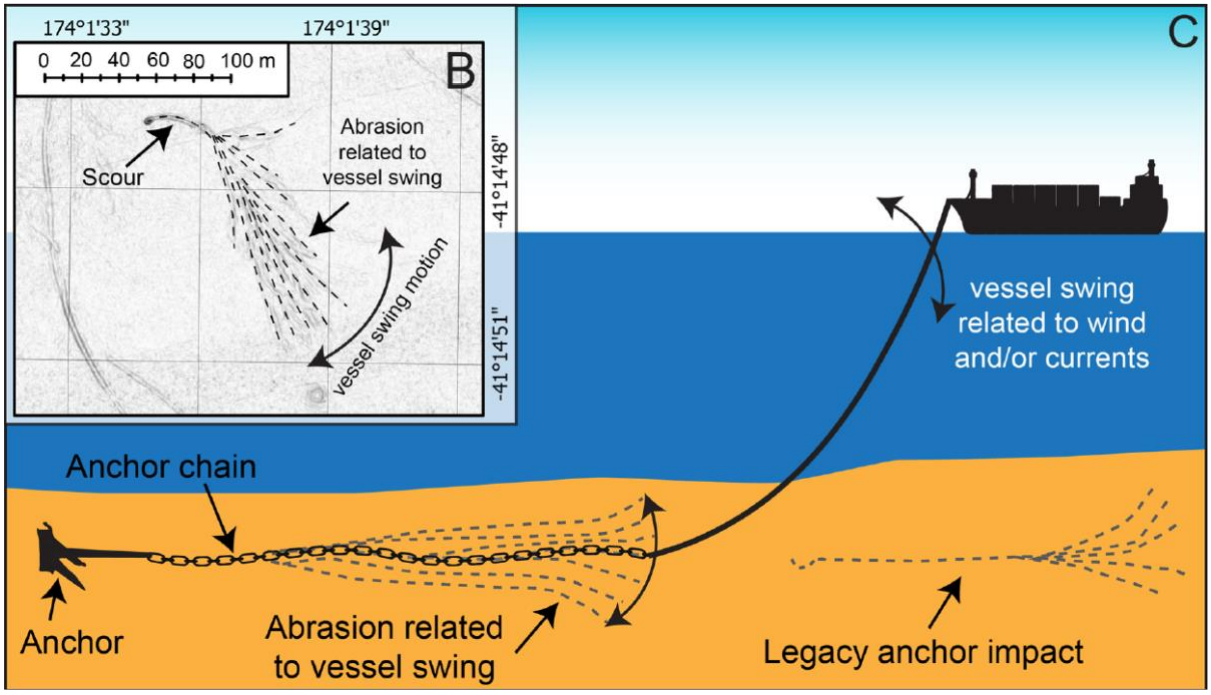
King C 2023. The costs and benefits of conservation versus logging of old-growth native forest: A case history. Ecological Economics 204: art. no. 107632.

Podocarp-tawa forest in Pureora Forest
Image source: Bruce Burns

4. Raking the seabed with anchors

One of the unexpected consequences of the Covid pandemic has been disruption to shipping such that many high-tonnage cargo ships are now often anchoring outside congested port areas waiting for entry for many days. Anchors of these ships are massive and attached by equally impressive chains. Watson et al. (2022) recently asked what impacts such anchor equipment are having on the seafloor. They used two repeat bathymetric surveys of an anchorage near Picton to assess the damage anchoring is having and related this with ship movement. Their results show that anchoring has an extensive and persistent impact on the seafloor. Anchors of large ships excavated the seafloor at Picton by up to 80 cm depth, and they measured individual ships displacing around 2,800 m^3 of sediment by anchoring. Overall, they estimated that the total volume of sediment disturbed by anchoring at Picton was 1.4 million m^3, and impacts of anchoring were still visible after four years. Such disturbances have a range of deleterious impacts to benthic communities, and biogeochemical and geomorphological processes. For example, the upper one metre of seabed typically stores up to twice the carbon of terrestrial soils, so are important for global carbon sequestration. Areas impacted by anchoring severely reduce this and other benefits. With global marine traffic predicted to increase in the future, this study has highlighted a key impact previously neglected.

Watson SJ, Ribó M, Seabrook S, Strachan LJ, Hale R, Lamarche G 2022. The footprint of ship anchoring on the seafloor. Scientific Reports 12 (1): art. no. 7500.



How anchoring gear can impact the seabed Image source Watson et al. (2022)

5. Plant-mite mutualism doesn't scale with leaf size

Plants have evolved a wide range of defences against herbivores to limit their loss of tissue. One of the more intriguing defences developed by plants are domatia which are small chambers or pits on the underside of leaves that act as houses for predatory arthropods, e.g., mites. These arthopods then defend the leaves they occur on from insect herbivores and fungal infection. Domatia are well-represented in the New Zealand flora (10 genera, approximately 67 species, Monks et al. 2007), wiht many of these occurring within the species rich genus *Coprosma*. Monks et al. (2007) working with *Coprosma lucida* showed that more mites occurred on leaves with domatia, and that these mites were sufficient to reduce fungal pathogens on leaves and increase plant fitness. Following from this work, Biddick (2022) has recently tested a hypothesis on the relationship between domatia number and leaf size. He surmised that as leaf size increased, a plant would invest in more domatia to cover the larger area of leaf tissue to be protected. Using a range of New Zealand domatia-bearing plants, he found that although domatia number was generally greater on larger leaves, this effect did not maintain the ratio of leaf area to domatia number as leaves increased in size. Obviously, the rules determining how plants invest in such defensive strategies are still unclear.

Biddick M 2022. Scale-dependent trends in the investment of leaf domatia. Biological Journal of the Linnean Society 135 (2): 235-241.

Monks A, O'Connell DM, Lee WG, Bannister JM, Dickinson KJ. 2007. Benefits associated with the domatia mediated tritrophic mutualism in the shrub *Coprosma lucida*. *Oikos* **116:** 873–881.

Domatia on underside of *Coprosma robusta* leaf Image source: Bruce Burns

Notice about 19th International Conference of Women Engineers and Scientists

The 19th International Conference of Women Engineers and Scientists, Auckland, New Zealand will be held at the Aotea Centre from Sunday 3 - Wednesday 6 September 2023.

Aotearoa New Zealand is a recognised leader in many fields of STEM despite its small size. We're a nation of innovators; science and engineering allow us to thrive far from the rest of the world. Our economy is dependent on STEM-based industries – from agriculture and biotechnology, to information technology and manufacturing – and we are guardians of unique natural environments, biodiversity and culture.

On behalf of the International Network of Women Engineers and Scientists (INWES), the Association for Women in the Sciences (AWIS) and Engineering New Zealand are delighted to have the opportunity to share our stories of women in science and engineering with the world through ICWES19 (the 19th International Conference for Women Engineers and Scientists), and are excited to invite others to share their expertise while exploring our shores.

ICWES19 aims to encourage, support, and advocate for greater gender diversity within traditionally male-dominated STEM career pathways. The conference celebrates and welcomes greater representation of women, non-binary people, and other minority gender identities within STEM, as well as those who advocate for greater diversity.

Notice about National Freshwater Conference 2023 – Discount for NZES Members

The National Freshwater Conference returns in 2023, at a time when it is vital for action to be taken to ensure future generations can enjoy Aotearoa's water.

This event will cover new legislation impacting freshwater including the RMA reforms, the National Policy Statement for Freshwater Management as well as an update on the Three Waters reform programmes.

KEY THEMES:

- Te Mana o te Wai's role in the future of freshwater management
- Adapting to the impacts of climate change
- Co-governance of freshwater
- Consenting strategies of different regions around Aotearoa
- Improving the quality of our countries freshwater

With speakers from the following companies:
Buddle Findlay | Dept of Internal Affairs | Envirostrat | KM Water | Ngati Pahauwera Development Trust | Richard Chambers | Russell McVeagh | Te Rangapu Mana Whenua o Tauranga Moana | The University of Auckland | Tipa & Associates | University of Waikato

This event has a multi-buy 3 for 2 ticket pricing option; as well as a Govt & Māori Trust tier price.

NZES Members are entitled to a **discount of $200** off the National Freshwater 2023 conference to be held in Wellington on 13-14 February 2023. To qualify, enter the **promotional code PROMO200** while booking online at brightstar.co.nz/freshwater

Agenda link:
https://bit.ly/3U4yEJ3

PLUS: Separately bookable workshop: Implementing Te Mana o Te Wai: He Wānanga
Workshop link:
https://bit.ly/3DYNaw3

Publications in the current issue of NZ Journal of Ecology (vol 47, issue 1 *in press*)

Review Article:
Robustness of field studies evaluating biodiversity responses to invasive species management in New Zealand
Robert B. Allen, David M. Forsyth, Darryl I. MacKenzie, Duane A. Peltzer

Research Articles:
Recovery of North Island kākā (Nestor meridionalis septentrionalis) within Pureora Forest Park, 2000–2020
Terry C. Greene, Tertia Thurley, Britta Basse

Trials with non-toxic baits for stoats and feral cats
Jenny Rickett, Penny Wallace, Elaine Murphy

Recruitment, survival and breeding success in a declining rifleman population
Nyil Khwaja, Stephanie A. J. Preston, Ben J. Hatchwell, James V. Briskie
Determinants of hatching and recruitment success for captively reared kakī (*Himantopus novaezelandiae*)
Scott D. Bourke, Liz Brown, Philip J. Seddon, Yolanda van Heezik

Growth rates and ages of some key tree species from subantarctic Auckland and Campbell Islands
Jonathan G. Palmer, Chris S. M. Turney, Zoë A. Thomas, Pavla Fenwick, Sarah J. Richardson, Janet M. Wilmshurst, Matt S. McGlone

Effects of altitude, seedfall and control operations on rat abundance in South Island Nothofagus forests 1998–2016
Kelly Whitau, Dave Kelly, Tim N. H. Galloway, Archie E. T. MacFarlane, Josh C. C. M. van Vianen, Laureline Rossignaud, Kim J. Doherty

Forum Article:
Towards a framework for targeting national-scale, native revegetation in Aotearoa New Zealand's agroecosystems
Bradley S. Case, Adam S. Forbes, Margaret C. Stanley, Graham Hinchliffe David A. Norton, Febyanna Suryaningrum, Rebecca Jarvis, David Hall, Hannah L. Buckley

Short Communications:
Post-settlement extinction rates for the New Zealand avifauna
Jamie R. Wood

Evaluating the effectiveness of a feral cat control operation using camera traps
Margaret Nichols, Alistair S. Glen, James Ross, Andrew M. Gormley, Patrick M. Garvey

Editorial:
Initiating open access licensing in the New Zealand Journal of Ecology to further promote ecological science and better align copyright with the intent of Te Tiriti o Waitangi
Thomas R. Etherington, Phil O'B. Lyver, Leilani A. Walker

Other recent publications on New Zealand ecology

Bruce Burns, University of Auckland

Apologies if I have missed your publication in my search. If I have, please send a citation to b.burns@auckland.ac.nz so I can include it in the next Ecotones.

Albariño RJ, Closs GP, Matthaei CD, Townsend CR, Zamorano D 2022. Substrate size modifies stream grazer–biofilm interactions in the presence of invertivorous fish. Ecology 103 (12): art. no. e3828.

Alder A, Jeffs A, Hillman J 2022. Timing mussel deployments to improve reintroduction success and restoration efficiency. Marine Ecology Progress Series 698: 69-83.
Anderson OF, Stephenson F, Behrens E, Rowden AA 2022. Predicting the effects of climate change on deep-water coral distribution around New Zealand—Will there be suitable refuges for protection at the end of the 21st century? Global Change Biology 28 (22): 6556-6576.
Atijegbe SR, Mansfield S, Ferguson CM, Rostás M, Worner SP 2022. Thermal requirements for egg development of two endemic *Wiseana* pest species (Lepidoptera: Hepialidae) of economic importance. Journal of Applied Entomology 146 (6): 753-759.
Barbosa VA, Graham SE, Smith BJ, Hogg ID, McGaughran A 2022. Assessing population genetic structure of three New Zealand stream insects using mitochondrial and nuclear DNA markers. Genome 65 (8): 427-441.
Basham E, Briskie JV, Martin P 2022. Variation in foraging strategies of New Zealand albatross species within a dominance hierarchy. New Zealand Journal of Zoology in press.
Bennett J, Poulin R, Presswell B 2022. Large-scale genetic investigation of nematode diversity and their phylogenetic patterns in New Zealand's marine animals. Parasitology 149 (13): 1794-1809.
Beukes PC, Weeber M, Neal M, Thiange C, Burger DF 2023. Evaluating nutrient abatement policies for a pastorally farmed catchment-lagoon ecosystem: A New Zealand case study. Agriculture, Ecosystems and Environment 342: art. no. 108227.
Blagen JR, Davies TRH, Wells A, Norton DA 2022. Post-seismic aggradation history of the West Coast, South Island, Aotearoa/New Zealand; dendrogeomorphological evidence and disaster recovery implications. Natural Hazards 114 (3): 2545-2570.
Buckley TR, Hoare RJB, Leschen RAB 2022. Key questions on the evolution and biogeography of New Zealand alpine insects. Journal of the Royal Society of New Zealand, in press.
Buddenhagen CE, Hackell D, Henderson HV, Wynne-Jones B 2022. Factors impacting the detection of weed seed contaminants in seed lots. Pest Management Science, in press.
Campbell CSM, Dutoit L, King TM, Craw D, Burridge CP, Wallis GP, Waters JM 2022. Genome-wide analysis resolves the radiation of New Zealand's freshwater *Galaxias vulgaris* complex and reveals a candidate species obscured by mitochondrial capture. Diversity and Distributions 28 (10): 2255-2267.
Carome W, Slooten E, Rayment W, Webster T, Wickman L, Brough T, Dawson SM 2022. A long-term shift in the summer distribution of Hector’s dolphins is correlated with an increase in cruise ship tourism. Aquatic Conservation: Marine and Freshwater Ecosystems 32 (10): 1660-1674.

Carter ZT, Hanson JO, Perry GLW, Russell JC 2022. Incorporating management action suitability in conservation plans. Journal of Applied Ecology 59 (10): 2581-2592.
Chapple DG, Naimo AC, Brand JA, Michelangeli M, Martin JM, Goulet CT, Brunton DH, Sih A, Wong BBM 2022. Biological invasions as a selective filter driving behavioral divergence. Nature Communications 13 (1): art. no. 5996.
Chisholm C, Di HJ, Cameron K, Podolyan A, Shah A, Hsu L, Shen J 2023. Soil moisture is a primary driver of comammox Nitrospira abundance in New Zealand soils. Science of the Total Environment 858: art. no. 159961.
Clere IK, Ahmmed F, Remoto PIJG, Fraser-Miller SJ, Gordon KC, Komyakova V, Allan BJM 2022. Quantification and characterization of microplastics in commercial fish from southern New Zealand. Marine Pollution Bulletin 184: art. no. 114121.
Cook F, Smith RO, Roughan M, Cullen NJ, Shears N, Bowen M 2022. Marine heatwaves in shallow coastal ecosystems are coupled with the atmosphere: Insights from half a century of daily in situ temperature records. Frontiers in Climate 4: art. no. 1012022.
Cox MP, Guo Y, Winter DJ, Sen D, Cauldron NC, Shiller J, Bradley EL, Ganley AR, Gerth ML, Lacey RF, McDougal RL, Panda P, Williams NM, Grunwald NJ, Mesarich CH, Bradshaw RE 2022. Chromosome-level assembly of the *Phytophthora agathidicida* genome reveals adaptation in effector gene families. Frontiers in Microbiology 13: art. no. 1038444.
Davis MT, Canning AD, Midwinter AC, Death RG 2022. Nitrate enrichment does not affect enteropathogenic *Escherichia coli* in aquatic microcosms but may affect other strains present in aquatic habitats. PeerJ 10: art. no. e13914.
Dehghan-Shoar MH, Orsi AA, Pullanagari RR, Yule IJ 2023. A hybrid model to predict nitrogen concentration in heterogeneous grassland using field spectroscopy. Remote Sensing of Environment 285: art. no. 113385.
Desjardins SD, Pashley CH, Bailey JP 2022. A taxonomic, cytological and genetic survey of Japanese knotweed s.l. in New Zealand indicates multiple secondary introductions from Europe and a direct introduction from Japan. New Zealand Journal of Botany, in press.
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Noticeboard of Upcoming Conferences

The next **Island Biology Conference** will be in the Aeolian Islands, Italy from 3-7 July 2023.

The next **Coastal Restoration Trust Conference** will be held on 15-17 March 2023 in Auckland. The theme of the 2023 conference will be on monitoring: ***Coastal restoration: Measuring our progress***. It will be hosted by the AUT Department of Environmental Science. Indoor sessions will be held at AUT, City campus, Building WG, level 2, 55 Wellesley Street East, Auckland Central. Fieldtrips will be held around the Auckland Region.

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