Latest newsletter from Centre for Biodiversity and Restoration Ecology, Victoria University of Wellington

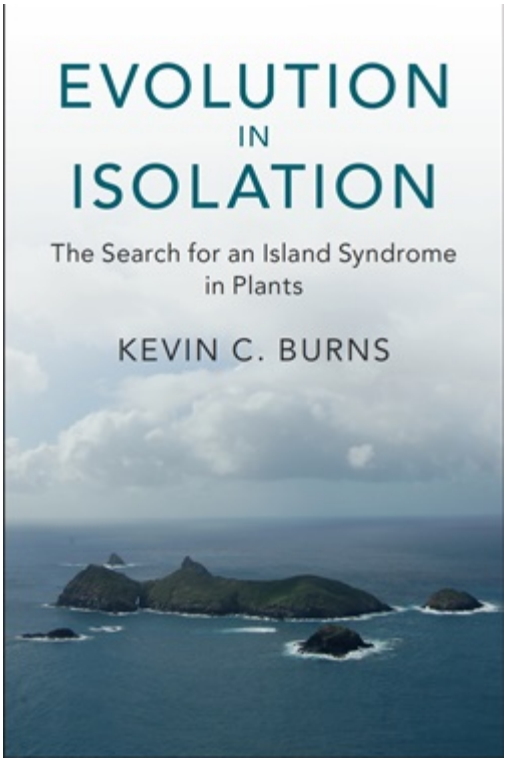
July 2019

Catch up with all that's going on at CBRE

Wetland restoration in the Wairarapa

Wetlands are important for human well-being, providing an array of benefits for people. Wetlands filter water, attenuate floods, and provide habitat for rare plants and birds. Despite their importance, wetlands are one of New Zealand's most at-risk ecosystems with more than 90% drained over the past century. Thankfully, many people are restoring and recreating these lost wetlands. Wetland restoration efforts provide a perfect opportunity to explore what we gain through restoration, both socially through stronger communities and ecologically through improved wetland habitats. Postdoctoral Research Fellow in Ecosystem Services, Stephanie Tomscha, wants to measure what we gain through wetland restoration as well as what we have lost through historical wetland drainage. Focusing on wetlands in the Wairarapa, she uses interviews, participatory mapping, and modeling to measure and map the consequences of wetland loss and the benefits of wetland restoration. She has found that the

consequences of past wetland loss for water quality and flood mitigation vary greatly across space, despite most wetlands being converted to pastureland. She is continuing to explore the spatial patterns of wetland loss and restoration at local and landscape scales



Evolution in Isolation

Oceanic islands are storehouses for weird creatures. Island animals break all the rules. Speedy, nervous, little birds repeatedly evolve to become plump, tame and flightless on islands. Equally strange are wonderful plants have evolved on islands. However, plants are very poorly understood relative to animals. Our research aims to determine whether plants repeatedly evolve similar patterns in dispersal ability, size and defense to island animals.

Read more on KC's book, *Evolution in Isolation*.

Memory performance influences reproductive success in a wild bird

Rutherford Discovery fellow Rachael Shaw has recently published a paper on influences on reproductive success in a wild bird.

"In brief, the study reveals that spatial memory performance influences reproductive success in a wild bird, the

New Zealand robin (*Petroica longipes*). This is the first evidence that spatial memory is linked to reproductive fitness in a food caching species.

We also found a gender difference in the reproductive and behavioural consequences of spatial memory. This suggests a possible role for conflict between the sexes in maintaining cognitive variation within a wild population. Together, the results reveal how selection can shape cognitive ability.

For me personally, this paper is the culmination of five years of work. The question of how selection shapes cognitive traits in the wild was what drew me to work with the robins in 2014, so it is really cool to finally have the first piece of the puzzle! I am sure there are many, many more pieces still to come..."

The research paper can be accessed through ScienceDirect.

PhD research has implications for New Zealand bird conservation

Research by recent Victoria University of Wellington PhD graduate Dr Nyree Fea shows significant differences in the way bird species respond to conservation efforts.

Her work, done as part of her PhD in Ecology, has implications for conservation management in New Zealand.

According to Dr Fea's research, large endemic birds like kaka or kereru respond positively to control of the mammalian predators that threaten birds in New Zealand forests: possums, stoats, and rats. However, species that arrived in New Zealand more recently, like the blackbird, silvereye and fantail, either show no change at all after the removal of mammalian predators, or in some cases even show a decline.

"Large, deeply endemic birds, like the kaka and tieke (saddleback), are believed to have been isolated from mammalian predators for longer and may have lost any natural defences against such predators," Dr Fea says. "For example, birds like kaka and tieke nest in holes and can be trapped by an approaching mammalian predator. Intensive predator control, like eradication of mammals from off-shore islands or sanctuaries like Zealandia, particularly benefits these species."

Read the full article.

Another of Nyree's PhD chapters on the nesting behaviour of fantails has been published in Arian Conservation and Ecology. Read the recent review by Predator Free New Zealand

Cat problem can only be solved by owners

The key to managing the impact of domestic cats on New Zealand's wildlife is to get their owners and vets on board, says Victoria University of Wellington's Associate Professor Wayne Linklater.

Conserving wildlife is not very different from improving public health. They both involve (sometimes nasty) debates between people with different opinions and values. In conservation, some value the management of predators above all else, while others value animal control that does not use poisons or is less cruel or they find value in the comfort of a pet cat.

My colleagues and I wondered if an approach called "behaviour prioritisation" might work in the controversy over the conservation of native wildlife and pet cats. The research process is simple, but potentially profound.

First, we looked at ways cat owners might reduce the killing their cats do and found nine possible approaches they could take. They could, for example, de-sex their cat or make them wear a collar with a bell. They could also fence their cat in or build them an enclosure, or even keep the cat inside 24-7.

We then asked cat owners which of those they already did or would be willing to do, and then asked vets which actions they would most support and which would be best for cat welfare. We also asked animal

conservationists which of the possible actions would best protect wildlife.

Overall, keeping cats inside at night (from before dusk until after dawn) received the highest score as the action that would most likely be accepted and would reduce the impact of cats on wildlife. Of course, keeping cats inside always would be the most effective way to prevent them killing wildlife, but this action was not supported by cat owners or vets.

*Read Associate Professor Wayne Linklater's and co-researchers' journal paper '**Prioritizing cat-owner behaviors for a campaign to reduce wildlife depredation'**.*

Read the original article on Newsroom.

The study of global environmental changes

CBRE PhD student Justyna Giejsztowt studies the interactive effects of drivers of global environmental change on community structure and ecosystem function in Tongariro National Park. Justyna used a combination of field-based vegetation surveys, experiments, and spatially explicit habitat modelling to predict the ways in which climate change may exacerbate the effects of plant invasion on alpine ecosystems. Justyna's work helps to identify the locations where high density stands of invasive species are likely to have significant adverse effects on culturally important native plant species.

Understanding the future of New Zealand’s unique Fiordland marine ecosystem

Returning from a 7-day voyage to Doubtful Sound, researchers from Victoria University of Wellington have been gathering information that will help them to predict how global climate change might impact New Zealand’s Fiordland ecosystems.

“After the success of the University’s voyage last year, and with funding support from the Department of Conservation, we were eager to get back on board the research vessel Southern Winds and continue our study with The Department of Conservation team,” said Dr Alice Rogers, who joined the Fiordland research team for the first time this year after being appointed as a lecturer in fisheries science at the beginning of 2018.

Like many locations worldwide, New Zealand is set to experience as much as a 2 degree increase in water temperatures over the next 50 years. This could have significant consequences for marine organisms, and for the valuable services they support, such as fisheries and tourism, says Dr Rogers.

“Last year we focussed on finding out about the distribution and abundance of organisms in the fiords, but this time it was all about understanding how the ecosystem works,” says Professor James Bell, who led

the team's first research cruise to Fiordland in 2018.

Exploring locations from the inner (landward), to outer (seaward) fiords, the research team conducted underwater SCUBA surveys, deep dives with a remotely operated vehicle, and collected water samples and specimens from the shallows to the deep.

"With the information we've gathered we will be able to say what the main sources of food are in different parts of the fiords, who eats who, and which organisms are most important to the overall health and stability of the ecosystem," says Dr Rogers.

Read the full article here.

Student conference reports

Four PhD students report back on their experience of presenting at international conferences

9th Conference of the International Biogeography Society, Spain, January 2019 | Matt Biddick

Thanks to the generous support of the CBRE, I attended the 9th Biennial Conference of the International Biogeography Society in Malaga, Spain. I presented the results of my work on offshore island plants on Wednesday the 9th in the Island Biology session, where I was fortunate enough to have world-renowned researches in attendance. Most notably was Mark Lomolino, who

spearheaded research into the evolutionary rule that I had tested in island plants. The talk was well received and followed by positive remarks and interesting questions. The evening poster sessions and drinks provided a relaxed atmosphere for students, early-career researches, and more established academics to mingle. I was thrilled to meet so many of the people I had contact with through the society in person.

Arguably the most important outcome of the meeting, however, was the opportunity to meet with, and demonstrate my work to, potential employers post-PhD. I met several primary investigators that are delving into many of the same evolutionary and biogeographic questions as myself and are in search of skilled post-doctoral researches to help do so.

I would like to thank the Centre for Biodiversity and Restoration Ecology for supporting me in my efforts to extend my skills, spread my research, and connect with some of the most important people in my field.

Society for Conservation Biology (Oceania) conference, New Zealand, July 2018 | Chris Woolley

Being awarded the CBRE conference/travel grant allowed me to attend the Society for Conservation Biology (Oceania) conference July 2018. This society is an important organisation in my field and the conference was an excellent opportunity to present my research and to meet and recieve feedback from others in my field.

During the conference, I gave a talk entitled “Restoring the lizard faunae of New Zealand cities” in which I spoke about my progress on my PhD research and shared the results of my first season of field work. I received questions at the conclusion of my talk and later during conference breaks spoke to numerous people who were keen to hear more about my research.

Attending the conference also allowed me to be exposed to new research and ideas. Prior to the first day of talks I attended a workshop on using social science in conservation. This clarified for me the pros and cons of using social science and provided me with examples of literature and methods that I could apply in my own research.
The conference was also an opportunity to meet researchers, practitioners from a wide variety of backgrounds: non-profit organisations, zoos, local and national government departments as well as researchers and students from other universities.

46th Annual Pacific Seabird Group (PSG) meeting, USA, Feb/March 2019 | Johannes Fischer

I received CBRE Conference Funding 2018 to attend the 46th Annual Pacific Seabird Group (PSG) meeting in Kaua’i, Hawaii, U.S.A. At this conference, I presented my first PhD chapter during an oral presentation, part of a special paper session on the restoration of Procelliifrom seabirds. Specifically, I discussed

estimates of population size and trends of the Critically Endangered Whenua Hou Diving Petrel before and after the eradications of invasive predators on its last stronghold (Codfish Island/Whenua Hou). These population size and trends were based on I) a 40-year burrow count dataset and II) a 16-year capture-mark-recapture study. My results indicated that eradication efforts did not result in (the expected) population increase following the eradication efforts, suggesting that additional threats are inhibiting the recovery of this species. Both Hawaii and New Zealand (as well as many other nations within the Pacific region) use eradications of invasive predators from islands to secure and restore the native island fauna. Therefore, the results from my analyses underlined the necessity of assessing and combating complementary threats, even with invasive predators as a prevalent threat. My presentation was well received, won the “Best Student Paper Award”, and was discussed considerably with managers from various international NGO’s (e.g., Island Conservation and Pacific Rim Conservation). As such, my attendance at PSG 2019 has facilitated the formation of useful international connections that will, without a doubt, benefit my future career. I am very grateful for the support received from the CBRE Student Conference Funding 2018.

Australian Society of Herpetologists and the Society for Reptile and Amphibian Research New Zealand, Australia, December 2018 | Ox Lennon

I attended the joint meeting of the Australian Society of Herpetologists and the Society for Reptile and Amphibian Research New Zealand in Brisbane in December 2018, and presented a 15 minute talk. It was really valuable to be able to discuss my research with experts from Australia as well as New Zealand My talk was attended by researchers from across the two countries, including someone whose work I drew on to design my experiments but I had not met. I was also awarded a prize for the best SRARNZ student talk, which was very gratifying! It was great to be able to meet other people working in my field in Australasia and hear about the research that's going on. As I'm in now in the last six months of my PhD, making and maintaining these connections is a huge benefit to my career prospects.

New CBRE deputy director

Dr Julie Deslippe has been appointed as deputy diresctor for the Centre for Biodiversity and Restoration Ecology. Please join us in congratulating Julie and wishing her all the best for the coming term.

Directors' Corner

The past few months have seen the release of two high-level reports with important implications for

biodiversity at global and national levels. The UN-sponsored *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (IPBES) report was released on 7th May 2019. The figures for unprecedent rates of species extinction and human-domination of geo-planetary systems documented in the report made for a sober read - and were widely reported in the media, for a day or two. What wasn't generally picked-up by the mainstream media was the finding that where indigenous peoples have retained or reclaimed significant management and co-management of natural resources the rates of biodiversity decline and loss of ecosystem services were lower. Whilst we are not doing things perfectly in New Zealand, the reality is that many countries look to New Zealand for examples of good management models that respect indigenous rights and perspectives. All the more reason to strive to do better.

"Improvement needed" is also the message from the national report released in April by the New Zealand Ministry for the Environment and Statistics New Zealand: *Environment Aotearoa 2019*. For us, the encouraging aspect of this report, however, is that at last we do have information on a broad sweep of environmental indicators gathered together in one place where politicians, policy-makers, scientists and the public can assess the state of the environment in a holistic manner, enabling us to measure trends for better or worse in to future. Information is a necessary pre-cursor to informed action, and continued monitoring is the only way that actions can be improved. We are optimistic that government ministries will use this information to inform future budgets and policies to effect greater environmental well-being and we look forward to a future where the state of our environment is managed as an equal sibling to economic and social well-being, since the three are so clearly inter-related.

We commend the thousands of researchers who generated the primary data as well as the IPBES and MfE/Statistics New Zealand who synthesized the data into these two reports. The expertise and effort required to produce these authoritative assessments should be celebrated.

Stephen & Julie
