NEW ZEALAND ECOLOGICAL SOCIETY

Newsletter

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FROM THE EDITOR

Kia ora koutou!

I've recently discovered the fun-filled Kupu Hou (new words) on twitter (https://twitter.com/KupuHou) and facebook (facebook.com/ngakupuhou). They post an image with an associated word or phrase several times a day. Many of them are amusing. For instance, 'Māhunga wai—idiot. Head (māhunga) full of water (wai)' was posted with a photo of Donald Trump. For more serious new words, I've signed up for Kupu o te Rā (http://kupu.maori.nz/) for daily new words to my inbox. They are also on twitter (https://twitter.com/kupumaorinz) and facebook (https://www.facebook.com/kupu.maori.nz). Another great resource I found today is the University of Auckland School of Psychology Māori and Pacific research ethics information page, https://www.psych.auckland.ac.nz/en/about/our-research/MaoriandPacificresearchethicswithintheSchoolofPsychology.html While this website is intended for Psychology researchers, there are plenty of useful links for all New Zealand-based researchers.

In this edition of the newsletter, we see the return of the popular Ecotones from Bruce Burns.

Ngā mihi,
Cate Macinnis-Ng

INSIDE:

ILLUSTRATE ECOLOGY

Fertiliser to Fertiliser

*The epiphitic Autumn orchid (*Earina autumnalis*) produces heavily scented flowers to attract insect pollinators. Here one such pollinator, the white plume moth (*Alucita monospilalis*), has been caught by a crab spider (*Sidymella angularis*). Crab spiders rely on camouflage, and pounce on their prey. This individual seems well matched to the orchid stems, but I have no idea how widespread the association is, having recorded it only on this clump of orchids in 2012, 2015 and 2016. Has anyone noted this elsewhere? Doubtless the orchid benefits if a certain proportion of its fertilisers are turned into fertiliser.*

Photo: John Flux, with thanks to Mike Fitzgerald and Phil Sirvid for identifying the spider.

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Layout and design: Jeremy Rolfe

*The deadline for submissions for the next issue of this newsletter is **Friday 9 September 2016**.*

FEATURE ARTICLE

Pigs and nineteenth century ecological change in New Zealand

Professor David Norton

The timing and nature of early impacts associated with the introduction of several invasive mammals to New Zealand is reasonably well known, e.g. the rapid loss of vulnerable birds to rodents. However, this information is not available for all invasive mammal species. Of the main herbivores and omnivores introduced into New Zealand, the ecology and especially the impacts of feral pigs is perhaps the least well known scientifically. Pigs are particularly interesting because they were the first large mammal to successfully naturalise. In this article I review some of the historical information that provides an insight into the abundance of pigs in the early decades after their introduction and speculate on the nature of their impact on New Zealand ecosystems by the middle of the nineteenth century.

Although common through Polynesia, pigs do not appear to have reached New Zealand with Māori settlement. Instead, pigs were first introduced by Jean François Marie de Surville in 1769 (Doubtless Bay, Northland) and James Cook in 1773 and 1777 (Queen Charlotte Sound and Cape Kidnappers). South Island feral pigs most likely originated from those released by Cook and supplemented by subsequent releases. North Island feral pigs however are more likely the progeny of animals released after de Surville and Cook – for example Governor King of NSW gave pigs to Northland Māori in 1793 and 1805. In the late eighteenth and early nineteenth centuries pigs were used for bartering by sealers, whalers and traders, as well as being deliberately released to establish future food supplies (e.g. on the Auckland Islands in 1807). Pigs were highly prized by Māori, who also spread them through bartering, as escapes from semi-feral herds and by gifting them to other hapū.

As has been well documented for other ungulates in the twentieth century (e.g. deer and thar), pigs must have undergone a similar irruption in numbers over the decades following their introduction. The available literature suggests that feral pigs were widely distributed across both main islands of New Zealand, as well as offshore islands such as Chatham and Auckland, by the middle of the nineteenth century. It is difficult to establish precise feral pig numbers but contemporary accounts document remarkably high numbers being killed. For example GM Thomson in his 1922 book 'The Naturalisation of Plants and Animals in New Zealand' notes that "in the Nelson province, Dr Hochstetter in 1860, …… states that three men in twenty months, on an area of 250,000 acres, killed no fewer than 25,000 pigs, and pledged themselves to kill 15,000 more". LJ Kennaway in his amusing account of farming in South Canterbury in the 1850s ('Crusts: A Settler's Fare Due South') noted that in the Fairlie area that "upon one large run ten thousand pigs hav[e] been butchered, with scarcely any perceivable decrease in their numbers". Similar high densities also appear to have been the case elsewhere in the South Island and through the North Island by the mid-nineteenth century. While some of these accounts might be somewhat exaggerated (Kennaway's account of early life in South Canterbury was undoubtedly designed to impress an English audience), it seems clear that within 60-70 years of being liberated, feral pigs reached very high numbers in many areas of New Zealand.

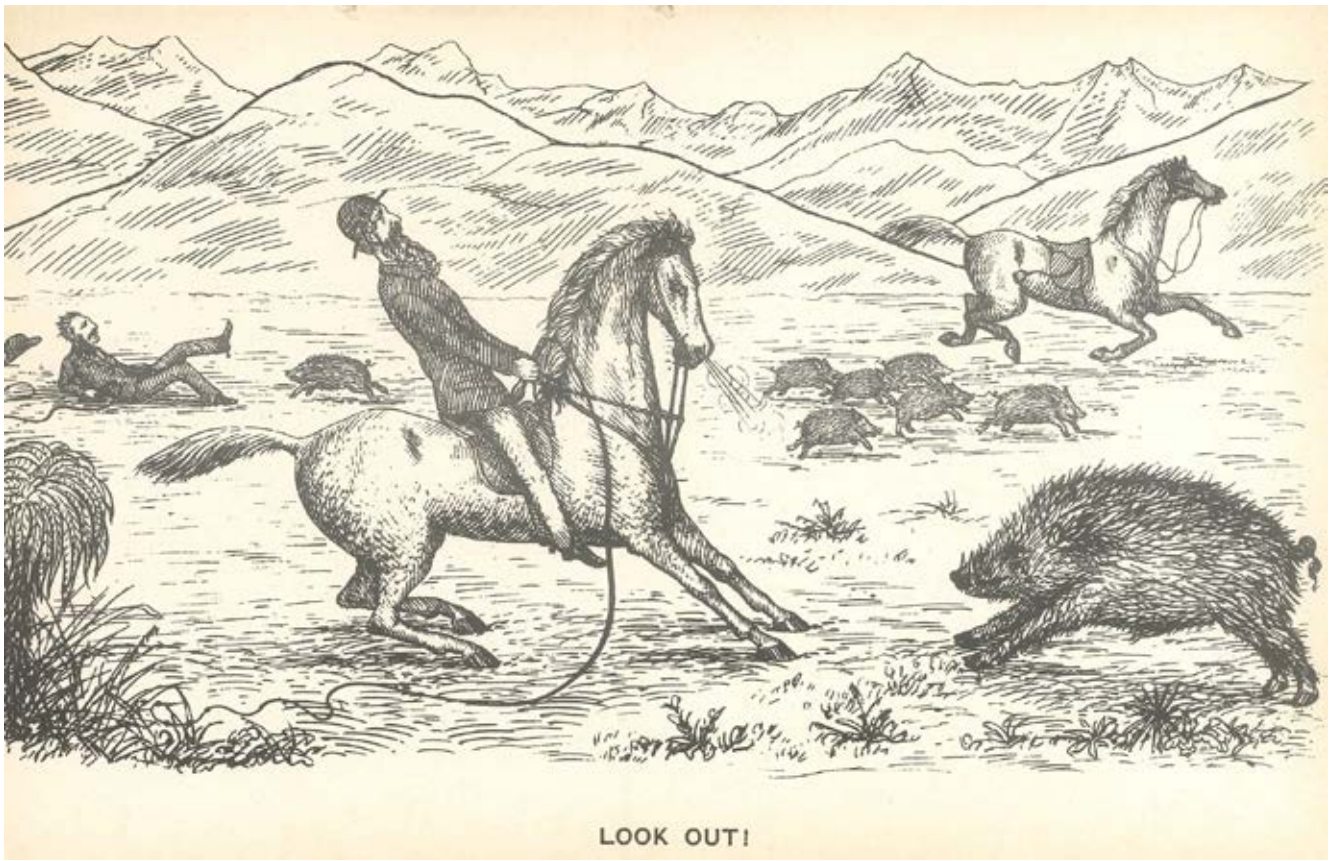
Given these numbers, it is interesting to speculate on what impact pigs might have had on natural ecosystems during the nineteenth century. Historical accounts of their ecological impacts are unfortunately scarce, but Thomson provides a summary of some of these as follows: Hochstetter noted in 1860 that in the Wangapeka Valley he "saw several miles ploughed up by pigs". Cockayne commented that feral pigs had nearly exterminated the Chatham Island forget-me-not (Myosotidium hortensia) and Chatham island speargrass (Aciphylla traversii) from the Chatham Islands, while Waite in 1909 commenting on Auckland Island observed that pigs have "already resulted in considerable havoc among ground-nesting birds, by destroying both eggs and young" and "Native plants are also suffering, for we found whole patches turned over, Bulbinella and Pleurophyllum evidently being favourites". Thomson noted himself with respect to the large speargrasses Aciphylla squarrosa and A. colensoi that in the South Island "Vast quantities of these plants were grubbed out by wild pigs, which are particularly fond of their succulent and aromatic root-stocks".

Feral pigs are found today in a wide range of native ecosystems including forest, shrubland, grassland and wetland, extending from the coastline to the alpine zone, and impact ecological values through digging (rooting), selective removal of plants like speargrass species and feeding on native fauna such as Powelliphanta snails and giant earthworms. Their rooting in particular can result in substantial ecological change across a wide range of ecosystems. In alpine grasslands, pigs can completely displace the native herbaceous species, uprooting tussocks and speargrasses alike. In mountain beech forests, their rooting can be quite deep (up to one metre), with huge volumes of soil displaced leaving beech roots exposed and looser than normal. When high winds occur, trees that would usually be resilient appear more vulnerable to windthrow with tree fall more severe in areas with rooting then in adjacent non-rooted areas. Given these modern observations and notwithstanding the comment in 'The Handbook of New Zealand Mammals' (second edition), "damage done by pigs on the mainland flora and fauna have not been, and now cannot be, properly assessed or distinguished from all the other consequences of human settlement", it would seem reasonable

to assume that the impacts in the middle of the nineteenth century must have been substantial. It is clear that species such as Chatham Island forget-me-not were significantly impacted and the effects of these impacts have certainly carried through and contributed to the rarity of this and other species today. This may also have been the case with the remarkable root parasite the wood rose (Dactylanthus taylorii), and perhaps pig rooting in the mid-nineteenth century set in train the factors that led to its rarity today? As with all eruptive oscillations, pig numbers eventually declined, probably as a result of the decline in preferred foods, which would also suggest high ecological impacts.

One of the major differences between the mid-nineteenth century and today is that exotic plants were scarce or absent then. Pig rooting disturbs the vegetation, turning over and exposing the soil and in open habitats such as tussock grasslands initiates vegetation succession. In the mid-nineteenth century, areas disturbed by pigs in tussock grasslands probably underwent succession back into tussock grassland vegetation. However, pig rooting today usually results in the replacement of native vegetation by exotic species such as the grasses browntop and sweet vernal and herbs like cats-ear and hawkweeds. Browntop doesn't appear to have become widespread until the mid-twentieth century, as was also the case with several exotic herbs such as the hawkweeds. So while feral pigs would undoubtedly have had a major impact at the very high numbers that were present in the mid-nineteenth century, perhaps the impacts were not as great in terms of altering successional patterns, as is the case in areas where feral pigs are present in high numbers today.

Feral pigs would have had a major impact on New Zealand ecosystems by the mid-nineteenth century when their numbers first reached high densities. These impacts undoubtedly resulted in changes in the composition and structure of the vegetation and this likely occurred across a range of ecosystems including grasslands, shrublands and forests. The vegetation described by early naturalists such as Julius Von Haast and Leonard Cockayne in the late nineteenth and early twentieth centuries was most likely, at least in places, already modified by the influence of the high feral pig densities some decades earlier. It is, however, difficult for us today, 160 years later, to appreciate either the magnitude of these mid-nineteenth century feral pig impacts or the changes that occurred as a result of them. Notwithstanding this, it is important that we acknowledge that by not long after the signing of the Treaty of Waitangi, native vegetation was already likely undergoing substantial change as a result of feral pigs even in areas that were not yet being directly impacted by other activities such as clearance and grazing, and well before the impacts of deer and possums became widespread.



Pig hunting in the 1850s, from LJ Kennaway, 1874, 'Crusts: A Settler's Fare Due South'

CONFERENCE REPORTS

Australasian Bat Society

Ben Paris from Auckland Council (https://twitter.com/NZBatman) attended the Australasian Bat Society Conference in Hobart in March 2016. See Ben's storify (compilation of conference tweets) here https://storify.com/NZBatman/australasian-bat-society-conference-2016. The document includes photographs, links and summaries of talks. Well worth a look! Ben says, 'My tweet-notes (as I like to call them) have been quite valuable both as a personal reference guide, and also as a networking tool with others in the same field both who attended, and who couldn't attend. It would be great if this sort of thing could be done more in the science field so everyone can be exposed to the learnings from conferences.'

Southern Connection

By Hannah Franklin, Australian Rivers Institute, Griffith University

I was lucky enough to kick off 2016 by attending the VIII Southern Connection Congress in Punta Arenas, Chile, thanks to funding from the New Zealand Ecological Society. The conference ran 18-23 January, hosted at the University of Magallanes. At 53° South on the edge of the Straights of Magellan, Punta Arenas really feels like the bottom world. Southern Connection aims to link natural scientists across the Southern Hemisphere, particularly those studying temperate ecosystems. This was easily achieved at the 2016 Congress, aided by our ever friendly and welcoming Chilean hosts. The remote location, small size of the city and the fact that most people stayed for the whole week, made it easy to get to know the other delegates.

I was initially attracted to Southern Connection as it is an interdisciplinary conference, and it did not disappoint. There were symposia on palaeoecology, invasion biology, biogeography, biocultural conservation and a broad range of themes that connect Gondawanan lands. I was also excited to connect with other researchers from the south, but I didn't fully appreciate how valuable this could be until I got there. I travelled in southern Chile for a few days before the conference and found the mountainous landscapes and flora, of Notofagus and tree ferns, to be eerily similar to New Zealand. Ecologically Chile faces many similar issues to New Zealand, shared environmental pressures include agriculture, tourism and the invasion of pines. Both countries boast birds that are particularly vulnerable to introduced predators and forest restoration projects have problems with seedling recruitment and predation. Questions posed during various symposia bridged knowledge between countries. What lessons could CONAF (Chile's National Forest Corporation) learn from New Zealand's Department of Conservation to manage tourism more sustainably in Torres del Paines National Park? Can we better understand the processes driving ecosystem development by comparing glacial chronosequences in Chile and New Zealand?

I was particularly interested in a symposium cryptically titled "Traditional and contemporary inter-hemispheric perspectives to integrate ecology, ethics and education into biocultural conservation". I had previously seen the term "biocultural restoration" used to describe the incorporation of human values in ecological restoration to enhance long-term restoration success. This can involve drawing on historical cultural knowledge of ecosystems to guide restoration or active community involvement to increase environmental awareness. But what this does this means in practice?

In this symposium there were several presentations on the Omora Ethnobotanical Park, some 300 km south of Punta Arenas on Tierra del Fuego. The park is a 400 hectare mosaic of sub-Antarctic ecosystems administered by the Omora Foundation and the University of Magallanes. Conservation efforts include control of invasive exotic fauna, such as the beaver and mink, and monitoring native bird populations, but in addition, there is a focus on promoting biocultural conservation. The traditional ecological knowledge of the Yahgan, local indigenous people, is taught alongside contemporary conservation science to students and eco-tourists visiting the park. Trails and signage explain the Yahgan and Spanish origins of scientific names and visitors can participate in research by banding and releasing their own bird.

On the other side of the Pacific is a citizen science program monitoring world heritage rainforests in northern New South Wales, Australia, run by the NSW National Parks and Wildlife Service and Macquarie University. This programme stands out in that volunteers are more than just observers or assistants in the scientific work. Over time they become

highly skilled by following set protocols and through direct supervision by scientists. This ensures the volunteers fully engage and learn from the experience and that high quality useable data is collected. The principles of biocultural conservation align well with those of citizen science.

Conclusions of the symposia were that the benefits to both to the community and conservation need to be well documented in order to support the theory of biocultural conservation; and that exchanges like Southern Connection were important to share and learn from the practical experiences of others.

Sporadic internet access quelled my hopes of "live-tweeting" the conference, so I am happy to have the chance fill you in on what was an interesting and fun interdisciplinary congress. If you are working on ecological issues shared across the Southern Hemisphere, it will be well worth establishing links at the next Southern Connection in Southern Brazil, I am sure it will not disappoint!

ECOTONES – A SELECTION OF THE LATEST ECOLOGICAL RESEARCH

Bruce Burns

A selection of recently published research on or relevant to New Zealand ecology (except that published in the New Zealand Journal of Ecology)

1. There's a velvet worm in my backyard!

Species of peripatus or velvet worms (Onycophora) are usually associated with old-growth indigenous forest in New Zealand and not the often highly disturbed ecosystems present in cities. These iconic invertebrates are predatory and mostly associated with rotting wood in humid, forested sites. However, reports accumulated over several decades have established that Dunedin hosts its own species of peripatus, with one report noting an occurrence of thousands of individuals at one site. Barrett et al. (2016) have recently analysed the distribution of this species in Dunedin, concluding that it persists in many habitat fragments including those dominated by exotic vegetation, and including urban gardens and forest plantations. They also found a curious association between the Dunedin peripatus and large *Fuchsia excorticata* - 'peripatus were found between the sheets of flaking bark that are characteristic of this tree species, and which harbour large accumulations of potential invertebrate prey such as small arachnids'. Larger (longer) rotting logs were more likely to contain peripatus also, emphasising the importance of retaining coarse woody debris as habitat in urban settings. This research highlights the potential importance of urban habitats for biodiversity and the danger of assumptions that urban areas do not contain such valued species.

Barrett, D., Recio, M.R., Barratt, B.I.P., Seddon, P.J., van Heezik, Y. 2016. Resource selection by an ancient taxon (Onychophora) in a modern urban landscape: A multi-scale analysis approach to assist in the conservation of an animal phylum. Landscape and Urban Planning, 148, pp. 27-36. DOI: 10.1016/j.landurbplan.2015.11.008

2. When did stoneflies arrive in New Zealand?

The New Zealand landmass broke away from the Gondwanan subcontinent about 82 million years ago, but was subject to the Oligocene drowning ca. 25–22 million years ago. It is still unclear and controversial how much of New Zealand was submerged at this latter time, with some estimates suggesting almost complete loss of land surface. This has important biogeographic implications as to the source and time of colonization of New Zealand's biota. Stoneflies (order Plecoptera) have often been identified as critical to this question, as they are poor dispersers and are intolerant of salt water. The high endemicity observed in this taxa is consistent with their low capability for long distance dispersal. McCulloch et al. (2016) have now reconstructed the phylogenetic relationships amongst southern hemisphere stoneflies and used a molecular clock approach to date diversification. Interestingly, the age of the New Zealand lineages revealed in this analysis is more recent than New Zealand's break from Gondwana, and "could be consistent with the colonization of an emerging New Zealand following the end of marine inundation around 25 Ma". These results suggest that stoneflies are better at dispersing long distances than previously considered (also confirmed by their dispersal to Auckland and Campbell Islands), probably in what has been termed 'aerial plankton'.

McCulloch, G.A., Wallis, G.P., Waters, J.M. 2016. A time-calibrated phylogeny of southern hemisphere stoneflies: testing for Gondwanan origins. Molecular Phylogenetics and Evolution, 96, pp. 150-160. DOI: 10.1016/j.ympev.2015.10.028

3. Lizards as seed dispersers in New Zealand

Fossil evidence suggests lizards were once highly abundant throughout New Zealand ecosystems, and even in modern times, lizards have been estimated to reach 10,000 individuals per hectare in some circumstances. Should we therefore expect co-evolutionary relationships with plants and other ecosystem components in New Zealand? The role of lizards as seed dispersers is the subject of a new paper by Wotton et al. (2016). They synthesise existing, and present new data to show that (1) lizards prefer eating fruits coloured white or blue (a fruit colour often associated with divaricating shrubs), (2) lizards can eat significant quantities of available fruit of at least 23 native plant species, (3)

seeds will germinate successfully after passage through lizard guts, and (4) lizards generally disperse seeds relatively short but ecologically significant distances (probably <20m). This evidence suggests that lizards are important seed dispersers of the New Zealand flora even when lizards are at low densities, and were undoubtedly part of that suite of selective forces that shaped the New Zealand flora. Their roles in New Zealand ecosystems should not be discounted.

Wotton, D.M., Drake, D.R., Powlesland, R.G., Ladley, J.J. 2016. The role of lizards as seed dispersers in New Zealand. Journal of the Royal Society of New Zealand, 46 (1), pp. 40-65. DOI: 10.1080/03036758.2015.1108924

4. Possum browsing selection based on foliar nutrient quality

Since introduction to New Zealand, brushtail possums have caused substantial damage to New Zealand native forests through extensive browsing. However, this browsing is highly variable spatially and temporally, so that some trees are browsed to death while neighbours may be only lightly affected. New research by Windley et al. (2016) has sought to explain this patchy browsing by examining the variation in nutritional quality of plant foliage within forest stands. They included in their measurements the *in vitro* available nitrogen assay or AvailN which takes into account the quantities of protein, tannins and fibre in leaves, integrating both the content and accessibility of nutrients to folivores. In their study in the Tararua Ranges, nutritional quality of foliage varied spatially, seasonally on the same trees, and among species, with a significant positive relationship between extent of possum browsing and AvailN. Therefore, AvailN was a significant predictor of the browsing decisions of possums, and highlights its potential use for explaining browsing patterns of possums in New Zealand.

Windley, H.R., Barron, M.C., Holland, E.P., Starrs, D., Ruscoe, W.A., Foley, W.J. 2016. Foliar nutritional quality explains patchy browsing damage caused by an invasive mammal. PLoS ONE, 11 (5), art. no. e0155216. DOI: 10.1371/journal.pone.0155216

5. Success at translocating dactylanthus

Holoparasites are plant parasites that are fully dependent on their hosts for nutrition, with *Dactylanthus taylorii* (dactylanthus) New Zealand's prime example. Despite a large percentage of this life-form being threatened including dactylanthus, little research has been directed previously towards establishing new populations. In ground-breaking research, Holzapfel et al. (2016) record successful establishment of populations of dactylanthus at a site at Waipapa in the central North Island, at least 6km distant from any known population. Seed was collected from this nearest wild population and sown into plots within habitat judged as similar to dactylanthus habitat elsewhere. Dactylanthus established successfully in almost all plots sown after ten years, with tubers first recorded in two plots four years after sowing. The best establishment success occurred when seed was broadly distributed in areas with sufficient soil moisture and in situations dominated by known host species. Surprisingly, the sex ratio of the new populations were dominated by females, whereas wild populations are characteristically male-dominated.

Holzapfel, S.A., Dodgson, J., Rohan, M. 2016. Successful translocation of the threatened New Zealand root-holoparasite *Dactylanthus taylorii* (Mystropetalaceae). Plant Ecology, 217 (2), pp. 127–138. DOI: 10.1007/s11258-015-0556-7

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Azar, J.F., Bell, B.D. 2016. Acoustic features within a forest bird community of native and introduced species in New Zealand. Emu, 116 (1), pp. 22–31. DOI: 10.1071/MU14095

Barratt, B.I.P., Todd, J.H., Malone, L.A. 2016. Selecting non-target species for arthropod biological control agent host range testing: Evaluation of a novel method. Biological Control, 93, pp. 84–92. DOI: 10.1016/j.biocontrol.2015.11.012

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Boschen, R.E., Rowden, A.A., Clark, M.R., Pallentin, A., Gardner, J.P.A. 2016. Seafloor massive sulfide deposits support unique megafaunal assemblages: Implications for seabed mining and conservation. Marine Environmental Research, 115, pp. 78–88. DOI: 10.1016/j.marenvres.2016.02.005

Brock, J.M.R., Perry, G.L.W., Lee, W.G., Burns, B.R. 2016. Tree fern ecology in New Zealand: A model for southern temperate rainforests. Forest Ecology and Management, 375, pp. 112–126. DOI: 10.1016/j.foreco.2016.05.030

Brockerhoff, E.G., Dick, M., Ganley, R., Roques, A., Storer, A.J. 2016. Role of insect vectors in epidemiology and invasion risk of *Fusarium circinatum*, and risk assessment of biological control of invasive *Pinus contorta*. Biological Invasions, 18 (4), pp. 1177–1190. DOI: 10.1007/s10530-016-1059-8

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Cockrem, J.F., Candy, E.J., Potter, M.A., Machovsky-Capuska, G.E. 2016. Corticosterone responses to capture and restraint in Australasian Gannets, *Morus serrator*, at Cape Kidnappers, New Zealand. Emu, 116 (1), pp. 86–90. DOI: 10.1071/MU15012

Craw, D., Upton, P., Burridge, C.P., Wallis, G.P., Waters, J.M. 2016. Rapid biological speciation driven by tectonic evolution in New Zealand. Nature Geoscience, 9 (2), pp. 140–144. DOI: 10.1038/ngeo2618

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Etherington, T.R., Perry, G.L.W. 2016. Visualising continuous intra-landscape isolation with uncertainty using least-cost modelling based catchment areas: common brushtail possums in the Auckland isthmus. International Journal of Geographical Information Science, 30 (1), pp. 36–50. DOI: 10.1080/13658816.2014.926365

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NEWS FROM COUNCIL

Nominations for 2016 annual awards close on 8 July 2016 http://newzealandecology.org/awards-grants There are five awards on offer so get your nominations submitted soon!

NZES CONFERENCE 2016

Abstracts and registration are now open on the conference website. Please keep checking the website: http://era2016.com/ for updates as information is being added regularly.

We are pleased to announce that the first of our special symposia for the joint NZES & SERA Ecology & Restoration 2016 conference has been approved for Tuesday November 22nd:

Ecological Halos—A New Future for New Zealand's Biodiversity

Emerging, landscape-scale initiatives are laying the foundation for the return of indigenous biodiversity across mainland New Zealand. This symposium explores these initiatives, which often arise from community-based programmes supported by local and national governments. As fenced sanctuaries have created small but safe nurseries for previously extinct or declining species on the mainland, 'halos' of native bird populations have spread beyond the fences into areas surrounding the sanctuaries. A national vision for a predator-free New Zealand, barely imagined even a decade ago, is rapidly developing. The symposium takes stock of the present situation and considers challenges in the path to a predator free New Zealand and the return of abundant indigenous biodiversity to all New Zealand. The symposium organisers are David Butler and Charles Daugherty and the keynote speaker will be Sir Rob Fenwick CNZM, KSTJ. His working title is: A Predator-Free Future for New Zealand?

Bruce Clarkson Conference Chair.

ACROSS THE TASMAN

News from the Ecological Society of Australia (ESA)

The annual ESA conference will be held in Fremantle Perth on 28 November to 2 December 2016. Registrations are now open. Abstracts close Friday 15 July. Further details are available at the conference website http://www.esa2016.org.au/

Further news from the ESA can be found in their April Bulletin http://www.ecolsoc.org.au/publications/bulletin/esa-bulletin-april-2016

Science in Australia Gender Equity (SAGE)
Sage is an initiative of the Australian Academy of Sciences to address gender equity. The programme aims to enhance gender equity and wider diversity in Science, Technology, Engineering, Mathematics and Medicine (STEMM). The SAGE Pilot has adapted the UK-based Athena SWAN initiative that provides training on gender equity and accreditation on gender equity for universities and other research organisations. More information on SAGE can be found on their website http://www.sciencegenderequity.org.au/ or by following them in twitter https://twitter.com/scigenderequity

STUDENT AND RESEARCHER PROFILES

Joanne Aley

Photo: Joanne on Great Barrier Island during a research trip for her thesis.

Joanne is a MSc student (Biosecurity and Conservation) at University of Auckland supervised by James Russell, with funding from The Department of Conservation and a study award from the New Zealand Biosecurity Institute of New Zealand to investigate the environmental and pest management attitudes of Hauraki Gulf island communities.

Islands are important for conservation, due to both high levels of endemism and the vulnerability of those endemic species to introduced species. Considerable conservation measures have been focused on uninhabited islands, such as pest eradication followed by ongoing biosecurity monitoring. Due to successes on uninhabited islands the progression of mammal eradication to inhabited islands is increasingly being considered, serving to both increase the scale of biodiversity gains and enhance protection of reinvasion pathways among nearby islands. With progression to inhabited islands comes the need for better social engagement approaches. Evidence has suggested unplanned and unstructured social approaches towards mammal eradications on inhabited islands may increase barriers to achieving community buy-in, and often lengthy community dialogue and unclear resolution pathways. Focusing on four inhabited islands in the Hauraki Gulf, Rakino, Kawau, Great Barrier and Waiheke, my research involves three aspects: to survey the four islands' community's attitudes towards the environment and pest management; to develop and psychometrically test an attitudes assessment scale designed to measure broad contexts of attitudes towards pest management; and to develop and test a social profile framework of social aspects associated with pest eradication on inhabited islands, from which baseline information can inform planners. Through developing methods to consider social aspects of pest eradication programmes it is hoped this will enable more considered social approaches in the future. After submitting my thesis in July 2016, I would like to continue working in the area of the science-society interface for the benefit of both wildlife and people.

Dr Anna Paula Rodrigues

I moved to New Zealand in December 2011 to start a PhD in Forestry at the University of Canterbury in February of the following year. Supervised by Prof. David Norton and Prof. Matthew Turnbull, I developed a research in ecological restoration that involved a set of trials to test the effects of exotic grass removal, supplemental water, protection from herbivores, and shade on the establishment and growth of native dryland woody tree species in the Canterbury and Mackenzie Basin regions. I finished the PhD in December-2015, and I was hired by two researchers from Lincoln University in January-2016 to work as their research assistant. I am currently working on a few different projects, but mostly helping them set up some permanent plots in beech forest communities on the border of the South Island's Canterbury and West Coast regions. I am enjoying every aspect of this job. I have the opportunity to use the skills and knowledge that I have gathered over the years, and to learn more skills every day. This project is also giving the chance to work in a completely different environment from what I was used to since my undergraduate years in Brazil and my PhD. For both my bachelor's and master's degrees, I carried out studies in the Brazilian Cerrado, which is a savannah-type of vegetation that predominantly covers central Brazil. Working in montane temperate forests in New Zealand is offering me a range of challenges, especially physically—I was used to much warmer and drier climates, and flatter

slopes! I feel extremely lucky to be part of an innovative research and to be working with supportive people. Working as a research assistant is, to me, probably the most exciting part of a life-time of studies. I wish to pursue a career in research here in New Zealand; one that can give me the opportunity of combining theoretical ecology and hands-on ecological restoration and conservation for the benefit of all parts of New Zealand society.

THE NOTICEBOARD

DONATE NOW!
KAURI FUND FOR ECOLOGICAL SCIENCE

We invite you to help grow the science of ecology in New Zealand by contributing to the NZES Kauri Fund. This fund was established in 2001 to provide resources for initiatives that assist the development of ecology and ecologists in New Zealand. As the Fund grows, it will play an increasingly critical role in advancing the Society's goals and fund exciting new initiatives for New Zealand ecology.

Please consider a donation to the Kauri Fund, whether $10, $20 or $50, now or when you renew your subscription. You can contribute in two ways:

Send a cheque made out to: "NZES Kauri Fund" to the New Zealand Ecological Society, PO Box 5075, Papanui, Christchurch 8542.

Internet banking: credit to New Zealand Ecological Society, account 06 0729 0465881 00, identify the payment as "Kauri Fund".

UPCOMING MEETINGS

The 12th International Congress of Ecology (INTECOL 2017 Beijing)

Beijing, China

21–25 August, 2017.

As the host of the congress, the Ecological Society of China(ESC) warmly welcomes ecologists, environmental policy makers and practitioners to join this Congress from all over the globe.

The theme of the congress is "Ecology and Civilization in a changing World," which will focus on harmonious and sustainable development among people, nature, and society in the context of global change.

Thematic topics of the congress:

- Ecosystem services and management
- Global climate change and ecosystem adaptation
- Urbanization and regional environmental change
- Biogeochemical cycling and ecosystem health
- Ecological degradation and ecosystem restoration
- Environmental stress and biodiversity conservation
- Industrial ecology and green economy
- Molecular ecology and evolution
- Landscape pattern, process and sustainability
- Ecohydrology and watershed management
- Paleoecology, ecological dynamics and environmental assessment
- Agroecology, sustainable agriculture and rural development

Call for symposia

To promote collaboration and interdisciplinary dialogue, we invite you to propose symposia with specific topics. Proposals are encouraged to address the congress theme, if appropriate, but doing so is not necessary. Any timely and coherent subject of broad ecological interests will be considered. We also welcome proposals that explore interdisciplinary connections with areas of social and natural science outside of ecology.

Each symposium should have 8 to 10 speakers (15 min. presentations plus 5 min. discussions). The content of symposium should follow the form given in the attachment.

The deadline for symposium submission is 1 August 2016. Please submit your proposals to intecol2017@rcees.ac.cn and liding@rcees.ac.cn. The Congress Scientific Committee (CSC) will evaluate the symposium proposals and participants will be required to submit abstracts afterwards.

For more information about the 12th INTECOL International Congress of Ecology, please visit the website: www.intecol2017.org.

Society for Conservation Biology 4th Oceania Congress
Brisbane, Australia
6–8 July, 2016
The Society for Conservation Biology (SCB) Oceania will be hosted by University of Queensland Centre for Biodiversity and Conservation Science (CBCS). More details are available on the website: http://brisbane2016.scboceania.org/

Island Biology 2016
An international conference on island evolution, ecology and conservation.
University of Azores, Terceira, Azores
18–22 July 2016
http://www.islandbiology2016.uac.pt

Wild Places
The Environmental Defence Society's 2016 conference will explore New Zealand's Wild Places.
Viaduct Events Centre, Auckland
10–11 August 2016
http://www.edsconference.com/

Combined Australian Entomological Society 47th AGM and Entomological Society of New Zealand Conference
Rydges on Swaston, Melbourne, Victoria,
27–30 November 2016.
More details http://www.aesconferences.com.au/

Ecological Society of Australia Annual Conference
Esplanade Hotel, Fremantle, Western Australia
28 November – 3 December 2016
http://www.esa2016.org.au/

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(Effective from November 2015)

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SUBMISSIONS TO THE NEW ZEALAND ECOLOGICAL SOCIETY NEWSLETTER

Contributions from NZES members are sought in the form of:

- **Feature articles** on topics of interest to NZES members
- **Event announcements**, for listing on the *Noticeboard*
- **Conference reports**, on conferences of ecological relevance
- **Images**, for *Illustrate Ecology* on the newsletter cover
- **Ecology news from overseas**
- **Book reviews**
- **Post graduate profiles**

Feature articles can be up to 1,000 words accompanied by up to four images.

Conference reports should be around 600–800 words with up to three images.

***Illustrate Ecology* images** should be accompanied by a short title and a caption explaining the ecological concept illustrated.

Book reviews of up to 1,000 words are now published in the newsletter. If you would like to review a book of interest to NZES members, please contact the newsletter editor.

Postgraduate profiles of current or recent PhD, MSc, or Honours students should be no more than 200–300 words and include a 2-sentence blurb about yourself, a summary of your thesis written for a general scientific audience, and a photo and caption related to your research.

Please do not use complex formatting—capital letters, italics, bold, and hard returns only, no spacing between paragraphs. All photos should be emailed as high resolution (300 dpi) jpg files. All contributions and enquiries can be emailed to Cate Macinnis-Ng, the Newsletter Editor: newsletter@newzealandecology.org

Content for the September 2016 issue of the NZES Newsletter is due by Friday 9 September 2016.

JOIN THE NEW ZEALAND ECOLOGICAL SOCIETY

For information on joining the society and renewing a membership, please click the 'join' button in the top toolbar of the society website, newzealandecology.org.