NEW ZEALAND ECOLOGICAL SOCIETY

Newsletter

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Inside

From the Editor

Kia ora koutou,
Welcome to the last newsletter before the EcoTAS conference in Australia. For those attending I hope you have a fabulous time learning and sharing ideas. With 17 different symposia there is bound to be something for everyone! Those missing the conference can look forward to live updates from the conference, joining in with the AGM, or interesting reports in the next newsletter issues.

I recently enjoyed helping with an EcoBlitz at St Peters School in Cambridge. There were 20 ecologists assisting 40 students to learn about the biodiversity in their school. At the event we tried out the recently upgraded NatureWatchNZ app which has a new feature that can automatically identify your observations from a photograph! (See naturewatch.org.nz/computer_vision_demo) This is the second Ecoblitz at St Peters College and it was great to see that there were improvements since 2015, particularly in the wetlands. There is a superb video of the event made by the school here (youtu.be/FDvr5yIDAFs). It's very

inspiring to participate in these types of events because we can gain so much knowledge in a short amount of time by working together.

I'm looking forward to helping with the Whatipu bioblitz at the end of this month. Hope to see you there!

In this issue of the newsletter, there is a large update from the council including how you can participate in the AGM and an early summary of results from the membership survey. Shona Myers has contributed a neat report from the INTECOL congress in China. There is also a postgraduate profile of Lincoln University student Azhar, who is studying plant flammability. For a visual reminder of why we should love New Zealand check out the article from artist Tess Sherin. Thanks for all the excellent contributions to this newsletter. Hope you enjoy the read.

Ngā mihi
Angela Simpson

Illustrate Ecology

Photo: Julia Schmack

This photo shows Julia and Jacqueline Beggs during a field trip to one of the offshore islands in the Hauraki Gulf last summer. For her PhD, Julia is studying the factors influencing *Vespula* wasps on offshore islands in New Zealand.

Ecotones – New 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 or 'in press'). The list of other publications on New Zealand ecology can be found towards the end of the newsletter.

1. Evidence of spill over effects from a fenced reserve

Fenced (and other intensively managed reserves) are part of a suite of strategies for restoring sensitive biodiversity to landscapes. Most assessment of the effectiveness of fenced reserves has been directed appropriately to how fences influence biota within the reserve. Tanentzap and Lloyd (2017), however, have recently studied how such fenced areas affect biodiversity in the surrounding landscape; i.e. whether there is a recognizable 'spill over' which would extend the influence of such initiatives. They measured both vegetation and bird communities within the Orokonui Ecosanctuary near Dunedin, and in the landscape surrounding it. They found that mammal-sensitive, bird dispersed tree species had increased in abundance in the reserve and in the landscape relatively close to the reserve since fence establishment. This increase in mammal sensitive saplings was also correlated with greater numbers of frugivores close to the reserve that were presumably 'spilling over' and dispersing seed. The fenced reserve was therefore acting as a source of conservation benefits beyond its boundaries, and this study provides rare evidence of such effects in New Zealand. Such evidence will contribute to active debates on the value of different conservation approaches for solving the current biodiversity crisis.

Tanentzap AJ, Lloyd KM 2017. Fencing in nature? Predator exclusion restores habitat for native fauna and leads biodiversity to spill over into the wider landscape. Biological Conservation 214: 119-126.

2. It's noisy down there! Measuring soundscapes in the Hauraki Gulf

The undersea environment receives sound from a variety of sources including abiotic (e.g. waves), biotic (e.g. marine mammals), and increasingly anthropogenic (e.g. boats). The combination of these sounds at a site provides its soundscape. Sound is important to the biology of a range of marine organisms including crustaceans, urchins, fish, and marine mammals, so changes to the soundscape have ecological consequences. Putland *et al.* (2017) recently measured the soundscape of the Hauraki Gulf at six different listening stations over approximately 18 months to examine spatial and temporal trends. Over the course of these recordings, nine different biological sounds could be attributed to specific species. As well, increases in sound for some species occurred at dawn and dusk, indicating that the dawn and dusk chorus are not just terrestrial phenomena. The most common anthropogenic noise detected was passing vessels occurring in 1.9-35.2% of recordings depending on site monitored. This vehicle noise often overlapped in frequency and thereby masked biotic noise. The study demonstrated a complex soundscape for the Hauraki Gulf with distinct temporal and spatial patterns, and raises the possibility of monitoring marine ecosystems such as this using sound. It also indicated the current prevalence of anthropogenically-derived sound, and the risk of ecological interference of such noise if current trends to increase continue.

Putland RL, Constantine R, Radford CA 2017. Exploring spatial and temporal trends in the soundscape of an ecologically significant embayment. Scientific Reports 7 (1): art. no. 5713.

3. Muttonbirding diaries provide proxy records of southern ocean climate

Seabirds are predators in ocean ecosystems, and the availability of prey resources they hunt will change with physical ocean conditions. This variation in prey abundance will have flow-on effects to the reproductive success of these seabirds each year. Seabirds also forage patchily over large distances, so seabird productivity may be useful as integrators of widespread ocean conditions. Long-term data on seabird productivity may therefore relate strongly to oceanic climate. Humphries and Moller (2017) have used a dataset of muttonbirding (sooty shearwater) diaries kept by Māori families living in southern New Zealand which record harvest success over decades, to explore this seabird-ocean climate relationship. Surprisingly, their analysis showed that harvest success and chick size were strongly correlated with occurrence of ENSO effects in the subsequent year. La Niña events tended to occur after those harvest seasons with relatively high success and chick size, whereas El Niño events tended to occur after harvest seasons with relatively low success and chick size. Such unprecedented relationships suggest that these seabirds are responding to important but yet unknown oceanic changes which are also precursors to ENSO events, thus providing predictive power. Further research may discover what those precursors are, but in the meantime, monitoring seabirds may be a useful way of forewarning key climate events.

Humphries GRW, Möller H 2017. Fortune telling seabirds: sooty shearwaters (*Puffinus griseus*) predict shifts in Pacific climate. Marine Biology 164 (6): art. no. 150.

4. Birds and airports don't mix, but can we convince birds to dine elsewhere?

Airports generally have large flat, mown meadow areas adjacent to runways which attract avian granivores and insectivores. These flocks are a major issue for airports because of bird strikes by aircraft during take-offs and landings which cause aircraft damage and other losses estimated at *c.*US$1.2 billion dollars per year globally (and then there are all those dead birds!). Can we deter birds from visiting airports? Pennell *et al* (2017) suggest we now can. They present a technique based on a grass infected with an endophyte that produces anti-herbivore compounds that will deter birds. They planted this grass in large patches alongside runways at Christchurch and Hamilton airports and recorded (*i*) reductions in bird abundance on these areas compared to areas with the original vegetation nearby, and (*ii*) reductions in the incidence of bird-strike at these airports after the conversion to this new vegetation occurred. Such fascinating habitat modifications may be useful for such areas of high human-wildlife conflict to encourage bird populations to move to safer environments.

Pennell CGL, Rolston MP, Van Koten C, Hume DE, Card SD 2017. Reducing bird numbers at New Zealand airports using a unique endophyte product. New Zealand Plant Protection 70: 224-234.

5. Hope for fewer wasp stings this summer

Often one of the most difficult steps in the scientific process is taking positive results from scientific trials and extrapolating/upscaling these to a practical application. Fortunately, this has been achieved recently for Vespex®, a toxic bait for *Vespula* wasp species in New Zealand (Edwards *et al*. 2017). Invasive *Vespula* wasps cause significant ecological and economic impacts within New Zealand, and achieve very high summer densities in many areas particularly those with honeydew resources. Experimental trials have previously established that the use of fresh protein bait containing 1g/kg fipronil in bait stations over 48 hours will reduce wasp activity in the vicinity by >90%. Edwards *et al*. (2017) report on a programme that upscaled these trials at five different sites (with honeydew) ranging in area from 217 to 2477 ha. After application of fipronil on a 50X300m grid over 2 days in summer at each of these sites, wasp activity declined by >93% and honeydew resources available on tree trunks increased, compared to non-treatment sites. As well as demonstrating the feasibility of

applying such baits over larger areas, the operations were widely supported by a range of partner organisations and the public, suggesting such operations in the future will also be acceptable to the community. Hopefully this marks an important point in the war to regain our honeydew forests from wasps.

Edwards,E, Toft R, Joice N, Westbrooke I 2017. The efficacy of Vespex® wasp bait to control *Vespula* species (Hymenoptera: Vespidae) in New Zealand. International Journal of Pest Management 63: 266-272.

News from NZES council

Complied by council members

Date for the AGM

The 2017 annual general meeting will be held on Tuesday 28th November from 6.15 to 6.45 PM NSW time (that will be 8.15 to 8.45 NZ time) at the EcoTAS2017 conference venue in the Hunter Valley, NSW. People who want to participate remotely should get in touch with Cate Macinnis-Ng and we can arrange a Skype link. The conference programme is now available on the website http://ecotas2017.org.au/.

Council vacancies

We have some vacancies available on council for the coming year. All positions will become vacant at the AGM. Some councillors and other office bearers will be standing to be re-elected, but there will also be some current council members stepping down or finishing their terms. We are interested in finding a secretary, a postgraduate student council member, and at least one council member. We also need a webmaster so it would be great to find someone who is IT savvy. If you are interested in getting involved with council, please contact a current council member for further information. Our meetings are several times per year and we are a friendly bunch, always interested in fresh contributions.

2017 marks the end of our current five-year strategy so in 2018 we will be refreshing our focus through reflection on ongoing activities and future aspirations for the Society.

EcoTAS 2017 conference update

Our combined annual conference with the Ecological Society of Australia is coming up very shortly. There is a great scientific programme and some fun social events planned. The conference programme is now available on the website http://ecotas2017.org.au/. We are looking forward to an enriching experience in the Hunter Valley.

New Zealand Journal of Ecology

The NZJE continues to flourish and our H-index recently increased to 1.704. We publish two issues per year and the journal is available at http://newzealandecology.org/nzje. Currently, the journal is fully open-access. We publish research relevant to New Zealand and the South Pacific.

Member survey

We conducted a member survey to better understand the needs of our members and to determine ways we can better serve those involved in ecological sciences. We invited responses from members and non-members of the NZES. We had a great response from across all sectors. There were 197 participants. About 30% of our members responded. There was an immense amount of positive feedback on the quality of the conferences and the high standard of the journal. There was also a call for more support for early career/emerging ecologists, which the society will look at ways of providing.

Equity and Diversity statement

We have recently prepared an equity and diversity statement with specific action points to enhance opportunities for women, Māori, Pacifica, and other under-represented minorities. The statement will be available on the NZES website once it has been shared with members.

Barlow Scholarship awarded

The Barlow Scholarship for 2017 has been awarded to Julia Schmack at the University of Auckland for her PhD research on managing *Vespula* wasp invasion in New Zealand. The Barlow Scholarship was established from a generous bequest from Nigel Barlow, who developed pioneering mathematical models underpinning pest management and wasp invasion in New Zealand. Fittingly, Julia's PhD research will build on Nigel Barlow's population model on the ecology of invasive *Vespula* wasps. Julia aims to identify genetic, environmental and pest management factors influencing the abundance of wasps on New Zealand offshore islands.

Climate Consensus Coalition Aotearoa

Following an invitation from Alan Mark (Chair of Wise Response Societyy Inc. and Life Member (2004) of the NZ Ecological Society), the NZES has officially registered their support for the Climate Consensus Coalition Aoteraroa (CCCA) Statement and Action plan.

The CCCA Statement and Action plan has been developed over the past 18 months, in consultation with some 20 other organisations, and the wider public, specifically to recommend to central Government for their urgent action to address climate change. In late August the CCCA had the formal support of approximately 60 NGOs and approaching 160,000 of their members, established through the website: (www.climateconsensus.nz). Recommendations in the CCCA statement align closely with those of the Parliamentary Commissioner for the Environment on climate action.

Newsletter archive

Bruce Burns has kindly provided a large number of scanned NZES newsletters to the council. These are now available online (http://newzealandecology.org/node/34). The archive now includes newsletters dating from November 1984 to the current issue.

Submissions

The New Zealand Ecological Society recently made a comprehensive submission on the Department of Conservation's Draft Threatened Species Strategy. You can read our submission here. Thanks to all those members who provided comments and helped to prepare the submission at short notice.

NZES conference 2018

An early announcement that the NZES conference for 2018 will be held in Wellington during November 2018. More details will be released in the newsletter and on our website as plans develop.

News from across the ditch

The Ecological Society of Australia July bulletin included articles about the cycle of ecological gains and setbacks, mental health, ecological literacy and how flying-foxes (fruitbats) cope with heat stress. Each of these topics overlap with topics in ecology in New Zealand and provide an example of the opportunities for fruitful discussion at the upcoming joint conference in the Hunter Valley. You can read more online here: www.ecolsoc.org.au/files/bulletins/esa_bulletin_july2017-web.pdf

We have been informed that the ESA Photo Competition is back and New Zealand applicants are certainly welcome. The three categories are Ecologists in Action, Adaptive Biodiversity, Australian Landscapes, and Remote Camera Images. More information can be found here www.ecolsoc.org.au/media-and-events/esa-photo-competition

Report from the INTECOL Congress, 2017

Shona Myers

Outgoing President, INTECOL

The 12th INTECOL (International Association for Ecology) Congress was held in August 2017 in Beijing. The Congress was hosted by the Ecological Society of China. INTECOL was founded in 1967 in The Hague, in response to ecologists seeking greater international links, and to provide a forum to address major ecological problems. This global meeting of ecologists was INTECOL's 50th birthday celebration.

The central theme of the Congress was 'Eco-Civilization', recognising the importance of the integration amongst environment and people. Ensuring the link between people and the environment is vitally important for addressing the world's problems. In her key note speech Professor Sandra Luque echoed this in providing her holistic vision for biodiversity and conservation, incorporating ecological processes and integrating people. There are enormous challenges facing our planet and the science of ecology is essential for our survival. We learnt that understanding the complexity of ecosystems is important for maintaining biodiversity. We also have a lot to learn from indigenous cultures who have lived in the environment for generations. The need for evidence based scientific information to base decisions on, and the value of dialogue with economists, policy makers, and decision makers is also critical.

As President of INTECOL my role included opening the Congress, running the General Assembly, jointly hosting the Congress banquet, and hosting a lunch for presidents and representatives from ecological societies around the world. It was a pleasure to work with members of the Ecological Society of China in organising this successful Congress. I also represented INTECOL at several symposiums including a forum on Eco-civilization and one on Dryland Ecosystems. I was part of a panel of experts discussing audience questions and debating the way forward for a greener more sustainable world.

The Congress provided us all with an amazing 5 days of international collaboration in ecological research, ideas, and conservation management solutions. We had a great line up of plenary speakers, and an excellent variety of symposia, workshops, and forums. A significant part of the success of the Congress was due to the large numbers of students and emerging ecologists attending. There were over 2400 participants from over 73 countries/regions

attending, and over 1000 students. The International Network of Next Generation Ecologists (INNGE) organised workshops and sessions specifically for early career ecologists.

At the Congress a declaration was developed which will be circulated through the INTECOL websites and will be sent to world decision makers. A summary of the Beijing declaration is:

"*Earth is the only planet habitable for human life and it requires efficient, effective and wide ranging international cooperation and exchange to safeguard its ecological security and ensure sustainable development. We as ecologists, must work and engage across society to protect this planet and its ecological integrity. INTECOL as the world's network of ecological science, will strive to facilitate enhanced research collaboration and synergy along with its members, and all national ecological societies at large.*"

The 13th INTECOL Congress will be held in four years' time in Geneva.

Presidents and representatives of world national and regional ecological societies at Presidents lunch, Beijing 2017.

Sun-Kee Hong and Shona Myers at the symposium on Eco-cultural solutions.

INTECOL Congress representatives at The Great Wall, China.

INTECOL Congress, opening ceremony, with video link to Prince Charles, Congress patron.

Inaugural Critic and Conscience Award to Mike Joy

Provided by Universities NZ – Te Pōkai Tara (universitiesnz.ac.nz)

Massey University academic Dr Mike Joy has been presented with the inaugural Critic and Conscience of Society Award for his work in drawing attention to the issue of water quality in New Zealand's rivers, lakes and drinking water. Mike Joy is an NZES member and was the recipient of the Ecology in Action Award in 2009.


Photo credit: Massey University

The Critic and Conscience of Society Award, sponsored by the Gama Foundation, acknowledges academic staff who provide independent, expert commentary on issues that affect the New Zealand community and its future generations. The prize of $50,000 is earmarked to support his further research.

The independent judging panel said that, Dr Mike Joy, had made a substantial contribution over the past two years to raise public awareness of an important issue facing the country.

Dr Joy is a Senior Lecturer in Ecology and Environmental Science at Massey University. He researches and teaches freshwater ecology and has studied the declining health of New Zealand rivers for decades. In particular, he focuses on freshwater fish ecology and distribution, ecological modelling and environmental science, producing reports for Councils and organisations around New Zealand.

He is also a well-known science communicator, media commentator and author on issues including the recent Havelock North drinking water contamination, the

state of New Zealand's waterways and its impact on biodiversity. Last year he published a book, `Polluted Inheritance` on freshwater and the impacts of irrigation and intensive farming.

Steve Weaver, a member of the judging panel and a former Deputy Vice-Chancellor Research at the University of Canterbury, said, "Mike's work has successfully placed a complex and difficult environmental issue on the public agenda. He's single-handedly raised awareness of an issue that's at the heart of our country's primary economy and environment. While some of his messages are unpalatable to some, Mike has been a fearless crusader to ensure this issue remains a top of the agenda for central and local government, as well as for the agricultural industry."

In receiving the award, Dr Joy said, "I'm extremely honoured to win the Award. I'm grateful for the support I have received from Massey University and especially hope that the existence of this award will motivate other academics to take up the unique but threatened privilege of being the critic and conscience of our society."

Under the Education legislation, New Zealand's universities have a responsibility to act as the critic and conscience of society, which underpins the important role of the public academic, and their freedom to provide independent expertise and comment on issues.

The Award is administered by Universities New Zealand which manages around 40 undergraduate and postgraduate scholarships.

Postgraduate profile: Md Azharul Alam

PhD Candidate, Lincoln University, New Zealand

I have just successfully finished the first year of my PhD research that focuses on understanding which functional traits affect the flammability of plants. This work is supervised by Dr Tim Curran, Dr Jon Sullivan (LU), A/Professor Hannah Buckley (Auckland University of Technology), Professor George Perry (University of Auckland) and Dr Sarah Wyse (Royal Botanic Gardens, Kew). The project is funded by Lincoln University.

Fire is a common disturbance agent in many ecosystems across the world and plays a significant role in changing landscapes, species composition, and carbon and nutrient cycles. While the fire regime is a vital component of many ecosystems, it can also have a devastating impact on human lives and infrastructure. Wildfires are also one of the key contributors to increased greenhouse gas emissions, and are expected to increase in frequency and intensity in many areas due to climate change. Hence, to reduce the damage to human lives and property, and to better manage fire-prone ecosystems, it is very important to understand the extent and behaviour of wildfires. Among the different factors that affect wildfires, plant species composition is important because different plants vary in their flammability and some species will promote wildfires within an area, whereas others can reduce fire spread. Therefore, an

understanding of variation in flammability across plant species will aid understanding of the behaviour of wildfires and how to inhibit their spread.

To better understand the flammability of plants, it is essential to study the functional traits that influence the ability of plants to burn. This will allow us to understand why some plants burn better than others, and will inform land managers about how they can modify vegetation across the landscape by altering the plant species composition of vegetation to mitigate fire spread. In this project, I am going to burn plant shoots using a specialized instrument called the "Plant BBQ" to determine plant flammability and collect a wide range of plant physical and chemical traits. I will measure traits such as moisture content, amount of dry matter, leaf morphology, plant architecture, and the presence of certain plant-produced chemicals, and use these to understand trait-flammability relationships. Overall, the findings will help us to select appropriate plant species to use when establishing green fire-breaks in strategic locations.

Azhar assessing the flammability of plants using the "Plant BBQ".

New Zealand's worth loving

Tess Sheerin

Artist Tess Sheerin is embarking upon a nationwide pollution awareness mural tour dubbed 'New Zealand's Worth Loving'. This NZWL tour aims to highlight issues of water pollution and its damaging effects on marine life, with mural locations in Queenstown, Dunedin, Christchurch, Wellington, and Auckland. Tess brings a unique style to each mural, making a striking connection between anthropogenic pollution and the effects on our wildlife in New Zealand, which is also a very relevant message on a global scale. The murals show everyday plastic items and pollution that we all have undoubtedly contributed to at some point. When you stand in front of one of these murals, you cannot help but leave with the image in mind and a thought of societies' contribution to the growing problem that is not going 'away', and certainly a problem that cannot be ignored for much longer.

'Unsealed' 307 Durham Street North, Christchurch 8013 - #3 of the New Zealand's Worth Loving Mural Tour

A recent study published in Science showed that an estimated 4.8 to 12.7 million metric tons of plastic entered the oceans in 2010 from people living within 50 kilometres of the coast in 192 countries[1]. In this study, Jambeck *et al.* combined available data on solid waste with a model that used population density and economic status to estimate the amount of land-based plastic waste entering the ocean. It is a startling reminder that plastic pollution is a growing problem and that unless waste management practices are improved, the flux of plastics to the oceans could increase by an order of magnitude within the next decade.

Everyday trash makes its way into the natural environment either intentionally or unintentionally; choking our waterways, damaging marine ecosystems, or becoming part of the marine food chain. All the plastics that end up in our waterways eventually break up into smaller and smaller pieces, micro plastics. Some of it floats, some of it sinks, but none of it ever disappears. This plastic continues to accumulate and circulate in our environment where marine animals can mistake it for food, which can cause starvation, dehydration, internal damage and even death. Recent research is now showing that plastics and other waste materials are being found in the food chain, and as more research is done, the true extent of this problem will come to light.

A recent study published in Nature reports some of the first findings of plastic debris in fish directly sold for human consumption raising concerns regarding human health[2]. Fish caught off the coasts of California and Indonesia and sold

[1] http://science.sciencemag.org/content/347/6223/768
[2] https://www.nature.com/articles/srep14340

in local markets have been found to have plastics and textile fibres in their guts, raising concerns over food safety. All of the anthropogenic debris recovered from fish in Indonesia was plastic, whereas anthropogenic debris recovered from fish in the USA was primarily fibres. The authors believed that variations in debris types likely reflect different sources and waste management strategies between countries.

'**Doubtful Dolphin' at 237 Willis St, Te Aro, Wellington**

Recent evidence suggests that the chemical signature of plastic debris may explain why certain species are predisposed to mistaking plastic for food. In other words, fish eat bits of plastic because they think they smell good. A study published in Proceedings of the Royal Society B by Savoca *et al.* found that anchovies reacted to marine 'fouled' plastic beads as if they were their crustacean prey[3].

Closer to home, ongoing (and currently unpublished) research from the Auckland University Institute of Marine Science has shown that of eight seafood species common in New Zealand, seven species were shown to eat plastic on a regular basis, potentially a health risk to seafood lovers in New Zealand[4].

Given the increasing numbers of scientific research reinforcing views that the growing impacts of plastic pollution is having a negative impact on our environment, what can we do about it?

As individuals and businesses, we can all make easy lifestyle choices to refuse single-use plastic, reduce our plastic footprint where possible, reuse plastic

[3] http://rspb.royalsocietypublishing.org/content/284/1860/20171000
[4] https://www.stuff.co.nz/business/farming/aquaculture/94814758/plastic-being-regularly-ingested-by-fish-consumed-in-new-zealand

where possible, and in cases where refusing, reducing, and reusing cannot be done; recycle plastic.

Action also needs to come from policy makers to put more emphasis on the development of policies and programmes that reduce the irresponsible use of plastic. One such example in New Zealand is the Soft Plastic Recycling Program[5], a recycling service funded by a grant from the Government's Waste Minimisation Fund matched by industry contributions, so now it is easier to enable soft plastics and soft packaging such as shopping bags, bread bags, frozen food bags and food wrap to be recycled, and reducing the environmental impact of plastic by diverting soft plastics from landfill.

While these recycling initiatives are positive move towards addressing the issues of plastic pollution, New Zealand can also be taking the lead from other countries' action to ban the sale of single-use bags and other disposable plastic items, or to impose consistent charges on customers who choose to use them.

Education and public awareness campaigns such as the NZWL mural tour, and many other grassroots projects emerging in New Zealand in recent times are another prong in the fight against the plastic problem. Having personally seen the 'Poorly Penguin' mural take shape in Dunedin, on a prominent wall near a supermarket carpark, the impact and value of this mural tour became very apparent. A permanent reminder for everyone entering and exiting this supermarket about the dangers of continuing with our addiction to disposable plastics, and to consider changing our behaviour for the health of the world that we leave for future generations.

'Poorly Penguin' 560 Andersons Bay Rd, South Dunedin, Dunedin 9012 - #2 of the New Zealand's Worth Loving Mural Tour

[5] http://www.recycling.kiwi.nz/solutions/soft-plastics

Other recent publications on New Zealand ecology

Bruce Burns

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.

Bosley KM, Copeman LA, Dumbauld BR, Bosley KL 2017. Identification of burrowing shrimp food sources along an estuarine gradient using fatty acid analysis and stable isotope ratios. Estuaries and Coasts 40: 1113-1130.

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Burge OR, Kelly D, Wilmshurst JM 2017. Interspecies interference and monitoring duration affect detection rates in chew cards. Austral Ecology 42: 522-532.

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Collins CJ, Chilvers BL, Osborne A, Taylor M, Robertson BC 2017. Unique and isolated: population structure has implications for management of the endangered New Zealand sea lion. Conservation Genetics 18: 1177-1189.

Dash JP, Watt MS, Pearse GD, Heaphy M, Dungey HS 2017. Assessing very high resolution UAV imagery for monitoring forest health during a simulated disease outbreak. ISPRS Journal of Photogrammetry and Remote Sensing 131: 1-14.

Dymond JR, Davies-Colley RJ, Hughes AO, Matthaei CD 2017. Predicting improved optical water quality in rivers resulting from soil conservation actions on land. Science of the Total Environment 603-604: 584-592.

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Fox CA, Reo NJ, Turner DA, Cook JA, Dituri F, Fessell B, Jenkins J, Johnson A, Rakena TM, Riley C, Turner A, Williams J, Wilson M 2017. "The river is us; the river is in our veins": re-defining river restoration in three indigenous communities. Sustainability Science 12: 521-533.

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Gillespie R, Bennett J 2017. Costs and benefits of rodent eradication on Lord Howe Island, Australia. Ecological Economics 140: 215-224.

Grange ZL, Biggs PJ, Rose SP, Gartrell BD, Nelson NJ, French NP 2017. Genomic epidemiology and management of *Salmonella* in island ecosystems used for takahe conservation. Microbial Ecology 74: 735-744.

Griffith JC, Lee WG, Orlovich DA, Summerfield T. 2017. Contrasting bacterial communities in two indigenous *Chionochloa* (Poaceae) grassland soils in New Zealand. PLoS ONE 12 (6): art. no. e0179652.
Gutiérrez-Ginés MJ, Robinson BH, Esperschuetz J, Madejón E, Horswell J, McLenaghen R 2017. Potential use of biosolids to reforest degraded areas with New Zealand native vegetation. Journal of Environmental Quality 46: 906-914.
Harker TD, Harker NF, Harker FR, Peace J, Barry M, Ludbrook MR, Ji W 2017. Analysis of footprints provides additional insights during monitoring of Duvaucel's geckos (*Hoplodactylus duvaucelii*). New Zealand Journal of Zoology 44: 305-318.
Hawke DJ, Cranney OR, Horton TW, Bury SJ, Brown JCS, Holdaway RN 2017. Foliar and soil N and δ15N as restoration metrics at Pūtaringamotu Riccarton Bush, Christchurch city. Journal of the Royal Society of New Zealand 47: 319-335.
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Noticeboard and upcoming conferences

The 6th joint conference of the New Zealand and Australian Ecological Societies is coming up! This will be held in the Hunter Valley, New South Wales from 26 November – 1 December 2017. The theme of the conference is 'Putting ecology to work' so there will be a strong applied ecology focus but there is also a wide range of sessions planned. More details on the website http://ecotas2017.org.au/

EcoTAS 2017

The joint conference of the Ecological Society of Australia and the New Zealand Ecological Society

ECOLOGICAL SOCIETY OF AUSTRALIA

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The Botanical Art Society of New Zealand (BASNZ) is delighted to announce that New Zealand will be taking part in the 'Botanical Art Worldwide' exhibition organised by the American Society of Botanical Artists and supported by the 'Friends of Auckland Botanic Gardens'.

This inaugural worldwide event, which will take place in many countries simultaneously, will bring together artists, institutions, and the public to highlight the role contemporary botanical artists play in bringing attention to the need of safe-guarding our planet's botanical diversity.

Our exhibition - 'Ngāi Tipu Taketake – Indigenous Flora' will take place from March 30th - 1st July 2018 at the Auckland Botanic Gardens, with the possibility of it travelling to other main NZ cities.

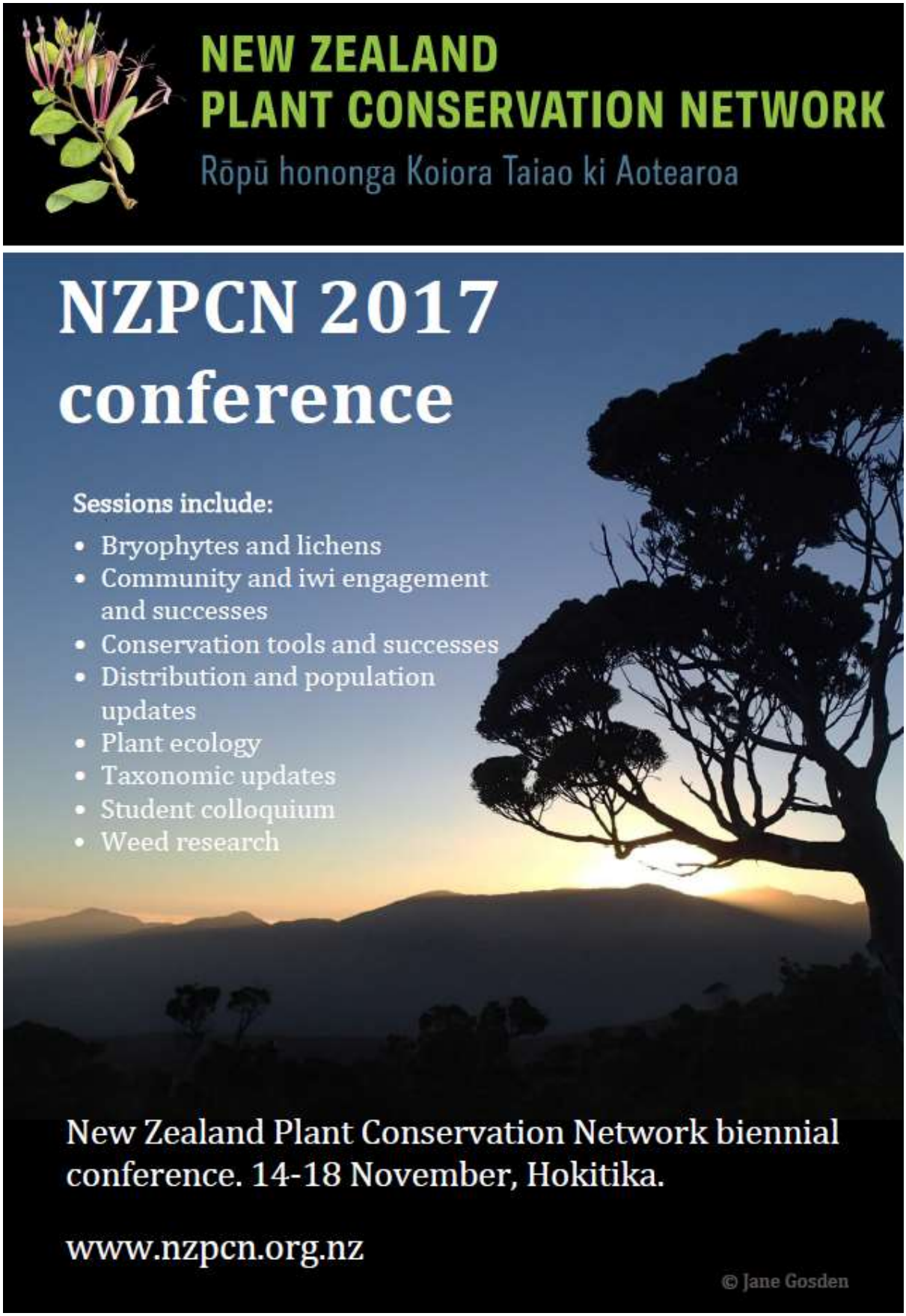
The Botanical Art Society of New Zealand is pleased to call for submissions for this exhibition. Artists interested in submitting paintings are invited to complete the submission form and provide details of their work.

New Zealand Plant Conservation Network Conference (14-18 November) & John Child Bryophyte and Lichen Workshop (19-20 November) 2017 - Hokitika

Registration is OPEN.

The conference consists of talks, workshops, & fieldtrips covering all things botanical from plant ecology & conservation, community restoration projects through to taxonomic updates. This year we will also be running a botanical art exhibition. Please visit our website for all the finer details. We are looking forward to seeing you all in Hokitika. Student travel scholarships are available.

http://www.nzpcn.org.nz/page.aspx?nzpcn_events_conference_2017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(Effective from November 2016)

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