



Newsletter

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From the Editor

Kia ora koutou

Welcome to the January 2020 newsletter. This the largest newsletter issue I have been involved with during my two years as editor. It is a fantastic reflection of the vibrant conference in Lincoln late last year. This issue includes announcements of the 2019 award winners, AGM minutes, and details on how to

get involved in the upcoming conference in Northland this year! This will be my last newsletter. I am passing on the newsletter editor role to Rowan Sprague. Thank you for the wide range of contributions, and friendly email exchanges over the past two years. It has been very enjoyable to put the newsletters together and help share ecological news across the country.

Ngā mihi Angela Simpson

Illustrate Ecology



Reflecting on golden reflections

By John Flux

The Slender burnished brass moth (*Thysanoplusia orichalcea*) is an agricultural pest. Originating in Indonesia, it now occurs from UK to Japan, Africa, and Australia (since 1975). It arrived at Pukekohe in 1983 and spread south, reaching Upper Hutt last year; and I found my first one in Lower Hutt on 22 October 2019. Like many Plusiinae, it rests head down, and I was surprised to see that the golden mirrors on the wings reflect the exact colour of whatever plant it is resting on, when viewed from above, over a fairly wide angle. This gives a predator the impression of looking through a hole in a dead leaf. In side-view (right picture) it shines "a shimmering gold foil colour".

Ecotones – New ecological research

Bruce Burns, University of Auckland

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

1. How did the once-abundant upokororo/grayling go extinct? Unravelling the dramatic effects of source-sink dynamics.

One of the biological tragedies and mysteries of New Zealand's eco-history was the rapid extinction of the New Zealand grayling in the first half of the 20th century. This freshwater fish was once highly abundant throughout most of New Zealand and was thought to have become extinct due to overfishing and competition with trout. These factors, however, don't explain the rapidity of the extinction or why it also became extinct in remote rivers without these threats present. Lee & Perry (2019) have now reviewed historic grayling observations to provide a fascinating new perspective. Their results give a very low probability that the grayling is not extinct, but the data couldn't narrowly pinpoint extinction date (estimated between 1924 and 1972). As grayling were amphidromous (spending part of their juvenile life at sea), they also explored source-sink dynamics as a potential contributor to extinction. In this model, rivers that were heavily fished and/or had trout competition were sinks, whereas rivers lacking these threats were sources. Essentially only source rivers produced juveniles that travelled to the ocean, that then had to restock both source and sink rivers. Lee and Perry found, using models, that even a low proportion of sink rivers was enough to dilute the number of returning juveniles in all rivers in each generation leading to population decline and eventual extinction. Although sad for the grayling, this new perspective on how source-sink dynamics can affect metapopulation viability may help mould new conservation strategies for other threatened amphidromous fish species.

Lee F, Perry GLW 2019. Assessing the role of off-take and source–sink dynamics in the extinction of the amphidromous New Zealand grayling (*Prototroctes oxyrhynchus*). Freshwater Biology 64 (10): 1747-1754.



Image: public domain, sourced from <u>https://www.newsroom.co.nz/2019/07/29/700359/closure-for-a-fishy-</u> cold-case

2. Tracking the invasion of exotic conifers: more species, greater spread.

A new assessment of the number and broad distribution of exotic conifers in New Zealand has shown continued increases in the richness of taxa gone wild and their ranges (Howell 2019). Exotic conifers are a group well represented as invasive species in New Zealand, and their spread as wilding conifers has been staggering (e.g.,

https://www.doc.govt.nz/nature/pests-and-threats/weeds/common-weeds/wildingconifers/). In this context, the ongoing introduction and naturalisation of new conifers is concerning. Howell (2019) counted 57 exotic conifer species now wild in New Zealand, an increase of 15 since the last assessment in 2008. As well, he identified that 371 conifer taxa are now grown in cultivation, about 63% of all conifers known globally, so the opportunity for further naturalisation is high. The highest regional richnesses of wild exotic conifers occurred around Nelson, Auckland, and the Volcanic Plateau; areas of high exotic forestry activity or human population density. Howell (2019) also looked for increases in distribution of exotic conifers and showed significant range expansion for at least 12 species since 2008. Moreover, the wide environmental tolerances of most conifers suggest further range expansions are likely. Howell's analysis clearly shows that more effective policies and procedures are required to reduce (1) the rate of new naturalisations, (2) the spread of exotic conifers, and (3) associated biosecurity costs.

Howell CJ 2019. Naturalised status of exotic conifers in New Zealand. New Zealand Journal of Botany 57 (4): 227-237.



Naturalised *Pinus strobus* in manuka at Makahu Saddle, Kaweka Forest Park. Image: Clayson Howell

3. Targeting success for rifleman translocations

Reintroductions of locally-extinct species through translocations are often reported in the media, but the subsequent relatively high failure rate of such translocations is not widely advertised. How can such failures be avoided? Key factors determining translocation success for animal species are transfer-related mortality and stresses occurring immediately post-release. Withers et al. (2019) have recently reported the results of a series of translocations of rifleman (*Acanthisitta chloris*) from the Boundary Stream Mainland Island to the Cape Kidnappers and Ocean Beach Wildlife Preserve, Hawkes Bay, carried out

between 2008 and 2010. In these translocations, the participants tried to reduce stresses associated with the capture and movement of birds by avoiding long holding and transfer times, feeding the captives well, and keeping unrelated individuals separate to avoid aggression related to territory defence. These measures substantially improved survival of individuals during transfer compared to earlier rifleman translocations. Post-release mortality or dispersal was still high, however, and population models still predicted that extinction of the population within ten years was probable without further management, e.g. reinforcement through further translocations. This study is important for two reasons: (1) it is a broad demonstration of the Humpty Dumpty principle (Lavigne 2005) that it is surprisingly difficult to put ecosystems back together again; and (2) that translocation practitioners can nevertheless make progress in improving translocation practice and success rates.

Lavigne P 2005. Restoration policy and recent books and articles on the topic: Humpty Dumpty and restoration policy. Natural Resources Journal 45(2): 495-506. Withers S, Armstrong D, Ward-Smith T, Parsons S, Hauber ME 2019. Improved methods

for reducing translocation mortality and obtaining reliable population projections for reintroduction of the New Zealand rifleman *Acanthisitta chloris*. Bird Conservation International 29 (4): 542-557.



Image source: Marleen Baling

4. Mapping fish communities across New Zealand's continental shelf

Quantifying spatial patterns of biodiversity is extremely useful for managing anthropogenic impacts and for conservation. Summarising patterns using complex multi-species distributions, however, is often challenging, and there is a vibrant research field actively seeking better and better methods of identifying and representing biotic variation across environmental gradients. In this context, Stephenson et al. (2018, 2020) have been working on classifying and visualising biotic patterns for the demersal fish of New Zealand's Extended Continental Shelf using the recently developed Gradient Forest technique. They used a long-term dataset of c. 27,000 research trawls with information on 253 fish species. The resultant classification is a highly effective view of how fish communities are distributed around New Zealand (Stephenson et al, 2018). At broad scales, fish communities are differentiated along gradients of depth and temperature; at finer scales, biotic differences match changes in productivity, sea-surface temperatures and tidal currents. Orange roughy characterize communities of deep, cold waters; javelinfish, ling and hoki waters of intermediate depth; red gurnard, tarakihi, carpet shark, John Dory, barracouda and spiny dogfish northern shallow waters; spiny dogfish, barracouda, hāpuku, tarakihi and red cod southern shallow waters; and red gurnard, snapper, and John Dory very shallow waters around New Zealand. This new classification will be particularly useful for management and conservation applications but also provides a basis for new hypotheses on fish community assembly and species-environment relationships within the marine environment.

- Stephenson F, Leathwick JR, Francis MP, Lundquist CJ 2020. A New Zealand demersal fish classification using Gradient Forest models. New Zealand Journal of Marine and Freshwater Research 54 (1): 60-85.
- Stephenson F, Leathwick JR, Geange SW, Bulmer RH, Hewitt JE, Anderson OF, Rowden AA, Lundquist CJ. 2018. Using Gradient Forests to summarize patterns in species turnover across large spatial scales and inform conservation planning. Diversity and Distributions. 24:1641–1656.



Image source: Stephenson et al. 2020 New Zealand Journal of Marine and Freshwater Research

5. What moves in the shadows? Managing domestic cats as predators within urban reserves.

For initiatives seeking to increase urban biodiversity, reducing the risk posed to wildlife by domestic cats is particularly challenging (van Heezik 2019). Wildlife in cities exist in a sea of cats, with densities in NZ urban areas reaching 220-250 km⁻², well above natural carrying capacity because of food supplementation and care by humans. Potential control of domestic cats is a polarising issue, however, with measures seeking to reduce wildlife predation by free-roaming cats often ignored by cat owners or challenged by cat advocacy groups who oppose any restrictions on cat ownership or activity. Woolley & Hartley (2019) have now contributed new information to the debate on cats and urban biodiversity. Studying cat presence and distribution in an urban reserve next to Zealandia Sanctuary in Wellington, they found that cats were present at all times of the day and night, although they were found more often near the edge than in the interior. They also conducted a survey of adjacent landowner attitudes and found that the reserve was highly valued by the community in general for provision of wildlife. There were significant differences, however, between the attitudes of cat owners and those without cats, with cat owners less likely to believe cats were a problem for wildlife and less likely to support suggested solutions. Woolley & Hartley (2019) conclude that advocacy and education may alter the behaviour of some cat owners but not all. They also highlighted the need for more research on prey choice by cats, specifically whether cats suppress rodents more than native wildlife, or not.

- van Heezik Y 2019. Cats and biodiversity (in NZ). <u>https://newzealandecology.org/cats-and-biodiversity-nz</u> (accessed 1/01/2020)
- Woolley CK, Hartley S 2019. Activity of free-roaming domestic cats in an urban reserve and public perception of pet-related threats to wildlife in New Zealand. Urban Ecosystems 22 (6): 1123-1137.

News from NZES council

Kia ora koutou. A happy new year, if you celebrate at this time of year! I hope everyone has been enjoying some sun this summer. Many of us will also be reflecting on the devastating fires across the ditch. The massive size and intensity of these fires seems unbelievable, yet the extreme conditions and the resulting catastrophic fires were clearly predicted by researchers some decades ago. Kia kaha!

This will be my last 'news from council' as I have finished my two-year term as President and move into the Immediate Past President role. We have a great mix of new and experienced council members on board for 2020. Congratulations to my good friend and long-time collaborator Tim Curran, as the new President. Our other council members are Kiri Wallace (Vice President), Kate McAlpine (Secretary), Chris Bycroft (Treasurer), Sarah Wyse (Councillor and Webmaster), Simon Moore (Councillor), James Russell (Councillor), George Perry (Journal Editor), Olivia Burge (Memberships Officer) and Rowan Sprague (Newsletter Editor). My very warm thanks to outgoing councillors Bruce Burns, Rachel Nepia, and Newsletter Editor, Angela Simpson. For some reflections on NZES Council achievements for 2019, please see my President's Report from the AGM. We will soon be calling for nominations for a Māori representative on Council as this is an important part of our equity and diversity statement and action plan. Please get in touch if you would like to know more about the role.

Our annual conference in Lincoln was a huge success. Thanks so much to the organising committee for providing opportunities to share our science and build our networks. It was great to familiar faces and lots of new people too - thanks to everyone who joined us. A real highlight for me was the launch of the special issue of the New Zealand Journal of Ecology on Mātauranga Māori. The editorial team did a fantastic job of bringing together some inspirational research - check out the papers on our website. Some of the keynote talks from the conference are available on our Facebook page. You will find a link to our Facebook page on our homepage - scroll down to find videos of Angela Moles, David Bowman, George Perry and Susan Walker giving their presentations.

Congratulations to all our award winners for 2019. Reading nominations for awards has been one of my favourite things about being on Council. We have so many truly inspirational ecologists working throughout the country. Thanks to all who take the time to nominate colleagues, mentors, mentees and role models. The award dates for 2020 will be pushed forward this year because our conference will be in July. Please look out for notifications on this and we encourage everyone to consider diversity when thinking about who to nominate.

Planning for our **annual conference** in Kerikeri in July is well underway. The conference website is live with all the details at: <u>https://confer.eventsair.com/nzes-2020-conference/</u> Symposium submissions are currently open. Key dates are -

19th Feb - Symposium submissions due Late Feb - Call for abstracts opens 17th Apr - Abstract submissions due 5th - 8th July – Conference (**Note:** the main conference starts on **Sunday** 5 July 2020).

Registration details will be available soon. As the conference will be running during school holidays, we are planning on having activities for school-aged children. The activities offered will depend the ages and numbers of children so please keep an eye out for that so we can cater for everyone. We'll also be beginning the main part of the conference on Sunday. The organising committee wants to make the day available to the broader public as an opportunity for ecological knowledge exchange.

Because of the earlier conference, we intend to have the AGM in July this year, rather than the usual late November or early December of recent years. Having the AGM at the same time as the conference maximises the opportunity for attendance. There will be a few complexities around having an earlier AGM but we believe it will be achievable at this stage. As always, there are opportunities for proxies and we are continuing work with video conferencing options so if you would like to join the AGM remotely, please get in touch. The mentoring scheme was hugely popular with participants last year. We've learnt a few things about how to make it more effective and we plan to open applications for 2020 soon. Look out for the call!

I'd like to finish by say thanks to all of you for your encouragement and support during my time as President. It has been a real pleasure getting to know many of you better. We have a wonderful community spirit in ecology in Aotearoa. We really need to draw on that if we are going to address the grand challenges of the biodiversity crisis and climate change. I'm excited to see what 2020 brings for NZES!

E noho rā, Cate Macinnis-Ng

2020 New Zealand Ecological Society Conference

5-8 July 2020, Kerikeri

Website: https://confer.eventsair.com/nzes-2020-conference/



19 Feb 2020 - Call for Symposia closes 17 April 2020 - Call for Abstracts closes 15 May 2020 - Early bird registration closes

Join us for the 2020 New Zealand Ecological Society conference to be held at the Turner Centre at Kerikeri in the beautiful Bay of Islands from **5-9 July 2020**. The conference rarely comes to the Far North so we encourage delegates to make the most of this opportunity. As well as sharing the latest ideas in ecology and conservation, delegates will have the opportunity to observe some of Northland's iconic biodiversity in one of New Zealand's most important cultural centres.

We have committed to an **opening conference day of Sunday 5 July** with the three-day conference running until Tuesday 7 July. Field trips will take place on Wednesday 8 July. This is so we can encourage community and local practitioners to join us in Sunday sessions.

There are a couple of reasons for doing this. Firstly, there is a lot of good adaptive management being done up here and around the place by community groups, NGOs and Trusts. It would be good to hear about it and also their problems. Secondly, we really noticed that there was a need for scientists to engage more with community. Often we heard from presenters that they 'don't get out of the office as much as they like'. We want to give both the scientists and community an opportunity to hear from each other and make better connections.

See you there!

2020 Organising Committee:

Olivier Ball North	Тес
Dai Morgan	NorthTec
Dion Pou	The University of Auckland
Lisa Forester	Northland Regional Council
Katrina Hansen	Northland Regional Council
Ilse Corkery	Department of Conservation
Lisa Denmead	Toi Ohomai Institute of Technology
Helen Ough Dealy	Department of Conservation
Manue Martinez	NorthTec
Cate Macinnis-Ng	The University of Auckland

With special thanks to Graham Hickling for assistance with the programme.

NZES 2019 AGM Minutes



NEW ZEALAND Ecological Society

66th Annual General Meeting

Lincoln University

3 December 2019, 12.30pm

Minutes

Attending: James Russell, Kate McAlpine, Susan Timmins, James McCarthy, Bruce Burns, Yanbin Deng, Frances Schmechel, Cynthia Roberts, Laura Molles, Judith Roper-Lindsay, Mick Clout, Deb Wilson, Elise Arnst, Rowan Sprague, Sarah Wyse, Olivia Burge, Lisa Denmead, Olly Ball, Jacqueline Beggs, James Brock, Elizabeth Elliot Noe, Monique Hall, Erana Walker, Sandra Anderson, Thomas Etherington, Esther Dale, Nicola Day, Ruth Bollongino, Alastair Robertson, Angus McIntosh, Clayson Howell, Simon Moore, Shona Myers, Peter Bellingham, Fleur Maseyk, Colin Meurk, Carol West, Robyn Simcock, Paul Dutton, Michael Fake, Boonyanuj (TK) Yukate, Angela Simpson, Sarah Busbridge, Dave Kelly, Tim Curran, Chris Bycroft, Cate Macinnis-Ng, Kiri Joy Wallace (39 members, which met quorum of 30, and 9 non-members)

Apologies: Mel Galbraith, John McCallum, Karen Palmer, John Parkes, George Perry, Fred Overmars, Janet Wilmshurst, Susan Walker

Minutes

1. Welcome and apologies – Cate Macinnis-Ng

2. Approval of 2018 AGM minutes – Kiri Joy Wallace

a. Motioned by Cate Macinnis-Ng, seconded by Tim Curran.

3. President's report – Cate Macinnis-Ng

- a. See appended report, including special thanks to the 2019 conference organisers.
- b. Cate Macinnis-Ng moved that the President's report be accepted, James Russell seconded.

4. Election of office bearers – Cate Macinnis-Ng

- a. **President** Sarah Wyse moved Tim Curran be nominated, seconded by Cate Macinnis-Ng.
- b. **Vice President** Tim Curran moved Kiri Wallace be nominated, seconded by Cate MacInnis-Ng.
- c. **Treasurer** Tim Curran moved Chris Bycroft be nominated, seconded by Carol West.
- d. **Secretary** James Russell moved Kate McAlpine be nominated, seconded by Susan Timmons.
- e. General Council Roles (4 available):
 - i. Tim Curran moved Nicola Day be nominated, seconded by Susan Timmons
 - ii. Cate Macinnis-Ng moved Sarah Wyse be nominated, seconded by Bruce Burns.
 - iii. Clayson Howell moved Simon Moore be nominated, seconded by Shona Myers.
 - iv. Bruce Burns moved James Russell be nominated, seconded by Cate Macinnis-Ng.

Cate Macinnis-Ng also mentioned Angela Simpson is stepping down from newsletter editor role, but as the position is appointed by council, that will be sorted by new council in early 2020.

5. Treasurer's report – Chris Bycroft

- a. See appended treasurer's report and performance report.
- b. Chris Bycroft moved the treasurer's report be accepted, Olivia Burge seconded.
- c. Chris Bycroft moved the performance report be accepted, seconded by Olivia Burge.
- d. Chris Bycroft motioned that NZES employ the same auditors to be used again for our performance reporting next year, seconded by James Russell.

- e. For authorisations on NZES bank accounts Tim Curran will come on board as President and be added to bank accounts (Clayson Howell removed as Immediate Past President). Motioned by Chris Bycroft, seconded by James Russell.
- f. A discussion ensued about the poor ethical/sustainability standing of the banks that the NZES uses (ANZ and Westpac for everyday expenses, as opposed to Simplicity where NZES invests extra funds). General suggestion to move to a new bank(s) with better ethical standing. Dave Kelly (NZES Kauri trustee) and Chris Bycroft responded that the NZES council had already been discussing this matter and would like to eventually make a switch. A suggestion was made that when this switch of bank accounts does happen, that the current NZES President sends a letter to the bank telling them WHY NZES is removing patronage. Alternative banks suggested: TSB or Kiwibank. Chris Bycroft and Dave Kelly both suggested the switch be a gradual process over 2020 as it's quite complex to undertake. Generally decided this wouldn't be an official motion in the AGM but something to work on administratively and actively by the treasurer and council.

6. Membership report – Olivia Burge

- a. See appended report by Olivia.
- b. Cate Macinnis-Ng motioned the membership report be accepted, Kiri Joy Wallace seconded.
- c. Carol West had a question during conference registration there is no uwaged + full member option, so is there a way to assist retired/unwaged society members? Olivia mentioned there has been discussion about this already by council and they want to do something about this. Olivia explained the intricacies of how to handle this and still meet the conference budget without making a loss or reducing the numbers of subsidized student registrations available. Olivia may try to look at attendance data from the 2019 conference to see about the best way to do this without taking funds away from supporting students and then try to accommodate for 2020 conference. Carol recognizes the difficulty in this situation. Cate asked how many people might be affected by an unwaged registration option (5 people raised their hands). Cynthia Roberts (and others attending) also added that she knows of fellow unwaged ecologists who weren't attending 2019 conference due to cost (despite being local), and that retirees still contribute a great deal to the society and would like to stay involved.
- d. Judith Roper-Lindsay asked about the current composition of the membership. E.g. Would have been helpful to know for the workshops who is in what field of expertise/role? Olivia explained how the sign-up process works and how there is a lot of free text in the current version but lacks useful form of demographics to identify this, but sign-up will be modified to make a more streamlined process to give NZES a better

idea of its demographics. Judith suggested that this demographic info might be helpful in the members-only section for networking of the members.

7. Journal report – Cate Macinnis-Ng on George Perry's behalf

- a. See appended report.
- b. Cate Macinnis-Ng motioned to accept the journal report, seconded by Dave Kelly.
- c. Dave Kelly commented: for 20 years at NZES AGM there has been discussion of death of society-run journals and should NZJE therefore sell to a publishing house? He feels now there is a swing in the other direction in the world of journals and available info, as there is an ever-increasing cost in publishing house journal page charges and journal subscription costs. Now open access is increasing in meaningfulness and value. NZJE has survived this period and now coming out on other side where being an open access journal is very important and valued (twice the citation rate!). Sitting tight like NZES has done and keeping journal production in-house seems to have been the right course of action!
 - James Russell: Society journals are not for profit but still open access.
 - Tom Etherington: NZJE is not technically open access because NZES retains copyright. NZJE is a "freely available" journal though. Perhaps eventually NZJE could drop this copyright and then therefore generate a larger income?
 - Chris Bycroft: NZES currently gets ~\$4K a year from JSTOR to buy our copyright.
 - Tim Curran added that cover art is being retained and so if we went true open access would that art be able to be used by others?
 - Tom Etherington: doesn't think this would be the case because it's not technically in an article, it's on the virtual "cover" online.
 - Carol West added: perhaps NZES should check legislative framework for NZ around copyright to understand this aspect better. What would advantage be to moving to true open access?
 - Tom Etherington: it would encourage people to disseminate our material (use in lectures, websites etc.). Also for publishing, some funding agencies (e.g. MBIE) may eventually require "true" open access and NZJE wouldn't currently qualify. Caution from meeting attendees not to make this move until MBIE implemented such a rule.
 - Cate Macinnis-Ng commented: it's great we are having this discussion as a society.

8. Newsletter report – Angela Simpson

a. 3 newsletters were produced in 2019.

- b. Angela is passing on role after 2 years, which she very much enjoyed.
- c. She encourages everyone to continue to send in contributions and maintain the diversity of newsletter, including the Ecotones section.
- d. Cate Macinnis-Ng extends a warm thank you to Angela for her service as newsletter editor.

9. Society Awards – Cate Macinnis-Ng

- a. Best publication and Barlow awards to be announced in early 2020 due to large number of nominations and processing time.
- b. Honorary life membership: to people who have made outstanding contribution to society. Cate Macinnis-Ng nominates Clayson Howell for this status due to his exceptional service to the society: Clayson was NZES Treasurer for 8 years, President for 2 years, and Immediate Past President for 2 years. Nomination was seconded by James Brock and followed a unanimous vote from all present that Clayson Howell receive honorary life membership to NZES.

10. Draft Sustainability Plan – Kiri Joy Wallace

- a. Kiri briefly outlined the plan in its current rough draft and strongly encouraged and welcomes feedback from the members on how to improve it before putting it into a final form and implementing in 2020. Please email her at <u>kwallace@waikato.ac.nz</u>.
- b. Kiri also thanks Fred Overmars and Sir Alan Mark for working together with her to form the current rough draft.

11. Any other business - chaired by Cate Macinnis-Ng

- a. Shona Myers gave a brief summary of INTECOL:
 - INTECOL is undergoing a nomination process to roll half of current board over and hence increase diversity and equity. If you are interested in this role as NZ representative, look at the INTECOL website for nomination process or talk to Shona Myers. FYI 2020 International Wetlands Conference (an INTECOL meeting) is coming up. And the next INTECOL Congress is 2021 in Geneva. They are welcoming new members to INTECOL as well so have a think about signing up. Online meetings are a norm, so for carbon footprint this is do-able and may be a model NZES looks to follow in future to be more sustainable.
- b. Tim Curran officially thanked Bruce Burns for his dedication to council as he is currently stepping down. Tim was joined in this by Cate Macinnis-Ng and others present.
- c. Colin Meurk: wanted to propose a few motions to the council to consider in the coming year about advocacy etc.:
 - i. Given the multiple emergencies facing the planet
 - ii. Given that all of these emergencies are ecological in nature and in solution

- iii. Given the 30 years of QBL (quadruple bottom line) rhetoric in government, corporate, business and community arenas, and yet failure of this to be implemented in Governance structures
- iv. Given the growing attacks on evidence-based science as an arbiter for action and consequent danger to life as we know it
- The NZES shall hereafter advocate strongly for there to be at least one <u>experienced ecologist on all governance structures</u> in the country (not as mere advisers at a tier below governance but of equal status to the roles of business, community, and cultural advocates that are almost universally on boards and executives these days.

AND

- v. Given the current proposal to ensure all school children receive a thorough grounding in NZ history
- The NZES advocate strongly (and contribute to curriculum) for incorporation of Natural History as part of that minimal education for school students, immigrants and visitors to this country.
- Note: understanding of our unique biogeography and ecological dynamics is vital to our identity, the role of biodiversity in placemaking (and therefore well-being), and necessary management/behavioural activities to maintain our biodiversity (we alone have that responsibility and the kaitiaki role).
- This might be called the development of ecological literacy as a vital part of our education about our total history and the cultural-environmental synergy and imperatives that follow.
- d. Comments to Colin's points: James Russell: says would be important to translate into a tangible model to deliver to authorities something they can easily digest and implement. Cate Macinnis-Ng added council is certainly on board with these sentiments, but because council is so time limited, need contributions from members to enact these ideas.
- e. Cate Macinnis-Ng said she is now becoming Immediate Past President and welcomed Kate McAlpine as the new NZES Secretary and Nicola Day and James Russell as brand new council members.
- f. Cynthia Roberts and the rest of the members acknowledged Cate's amazing work as NZES President.

Meeting closed at 13:52, 3 December 2019.

Reports from 2019 AGM:

President's Report (by Cate Macinnis-Ng)

Tēnā koutou katoa. I am delighted to present my second report, in Lincoln this year. I would like to thank the organising committee: Tim Curran, Adrian Paterson, Sarah Wyse, Lauren Waller, Jon Sullivan, Warwick Allen, Elise Arnst, James McCarthy, and Tom Etherington, and student day organisers TK Yukate and Max Clark. We have excellent support from Kerry South and her team from Conferences and Events. This is the third year Kerry has supported us (2015, 2018, 2019) in our conference preparation and running and this makes organising the conference a much more enjoyable experience for the organising committee. It's been a great conference so far and on behalf of council, I would like to acknowledge all the work and effort everyone has put into making the event successful.

We're trying something a bit different for the conference next year in moving it to July. Olly Ball and his team in Northland have plans underway and I hope many of you will be able to join us in Kerikeri in 2020.

We've had another productive year on council, including producing a baby – congratulations to Rachel Nepia! Other highlights include the production of the special issue of the New Zealand Journal of Ecology on Mātauranga Māori and the establishment of mentoring scheme.

The Mātauranga Māori issue was a huge team effort. A massive thank you to the guest editorial team – Cilla Wehi, Tara McAllister, Jacqueline Beggs, Amanda Black and Shaun Ogilve with support from Melanie Mark-Shadbolt. Thanks too, to all the authors who are doing the hard mahi and chose to contribute papers to the issue. I am very grateful to our sponsors – Biological Heritage NSC, the Centre for Biodiversity and Biosecurity, Te Pūnaha Matatini and Manaaki Whenua Landcare Research. The cash contributions each organisation provided allowed us to maintain our open ecology policy. George Perry as scientific editor has been supportive of this initiative. Sarah Wyse provided webmaster wizardry to set up the appropriate layout for the website and finally, James Brock provided expert technical editing to maintain the high quality of presentation that we all like to see in the New Zealand Journal of Ecology. We hope this initiative will enhance ongoing activity and engagement in this space.

The mentoring scheme was well-subscribed with 15 pairs of mentors and mentees. We had really great uptake on this and most of the feedback was very positive. Thanks to all who took part in this and we hope to do it again next year so look out for details about that.

At the beginning of the year, I contributed to a debate about 1080 use on the website Newsroom. In previous articles on the site, people using 1080 were painted as heartless and careless but I wanted to highlight the fact that 1080 is the best option we have in many remote areas while new methods and technologies are developed. While this isn't my specific area of expertise, I thought it was important I show support for our many members who work in conservation.

<u>https://www.newsroom.co.nz/@ideasroom/2019/01/17/401787/1080-debate-time-to-face-reality</u>. In addition to this popular communication, we have made submissions on Faulden Maar (thanks to Chris Lusk), the Zero Carbon Bill and the Biodiversity Strategy.

With the ongoing push to make active use of our strategic plan, the implementation of our report card has helped us focus our attention and efforts. Thanks to Simon Moore for establishing this approach. You all received a copy of this card via email recently so you can see for yourselves what work we have been doing. In particular, I want to highlight the work Olivia Burge and Sarah Wyse have been doing in developing a members only area of the website and Olivia has also been working on collecting better data on our members so we can work out exactly who we represent and if our equity and diversity plans are effective.

Our social media presence has grown again this year with over 4,200 followers on Facebook and almost 1,900 followers on Twitter. Both of these platforms allow us to reach a much larger audience than our membership base. Please connect and share messages and posts so we can continue to grow our followings. This is a cheap and simple way for us to engage.

We farewell two members from council this year. Councillor Rachel Nepia is leaving us to concentrate on parenting and Angela Simpson is leaving the newsletter role after two years. Rachel made significant contributions to the strategic plan and Angela has produced some brilliant newsletters by sourcing good quality content. We thank both and wish them the best in the future.

I would like to finish by thanking all council members for another fun and productive year. We are fortunate to have excellent financial management and planning from Chris, great organisation from Kiri, and humourous support from Tim and Clayson. It has been a joy to work with you all.

Tēnā koutou, tēnā koutou, tēnā tātou katoa. Cate Macinnis-Ng

Treasurers report (by Chris Bycroft) & Auditor's Performance Report

For AGM of the New Zealand Ecological Society Inc. on 3 December 2019

Account balances

2//11/2019	
NZES Cheque	21,933.68
NZES Savings	34,730.56
Barlow Fund	41,433.46
Kauri Fund	47,005.26
Westpac *	1352.48
Barlow (Growth Fund -Simplicity):	: 44,277.00
Kauri (Growth Fund -Simplicity):	45,738.00

Grand Total

236,470.96

Account balances 24/11/2018

24/11/2010	
NZES Cheque	22,384.94
NZES Savings	33,856.26
Barlow Fund	36,713.92
Kauri Fund	27,506.39
Westpac	4053.63
Barlow Term Deposits	28,000 (12 months 3.45%)
Kauri Term Deposits	18,000 (12 months 3.45%)
Barlow (Growth Fund -Simplicity):	: 14,538
Kauri (Growth Fund -Simplicity):	38,868

Grand Total

223,921.14

Date	16-Nov-16	13-Nov-17	24-Nov-18	27 Nov 19
Cheque	8,808.65	4,445.11	22,384.94	21,933
Savings	32,053.55	32,866.13	33,856.26	34,730
Westpac Cheque	1,661.73	4,278.22	4,053.63	1,352.58
Total cheque + savings	42,523.93	41,589.46	60,294.83	58,016.72
Barlow savings	5,253.74	18,971.67	36,713.92	41,433.46
Barlow term deposits	70,136.03	59,567.48	28,000.00	0
Barlow growth fund				44,277.00
(Simplicity)	0	0	14,538.00	
Barlow Total	75,389.77	78,539.15	79,251.92	85,710.46

Kauri Savings	10,583.20	20,488.99	27,506.39	47,005.26
Kauri term deposits	66,258.26	56,570.48	18,000.00	0
Kauri growth fund		0	38,868.00	45,738.00
Kauri Total	76,841.46	77,059.47	84,374.39	92,743.26
Grand Total	194,755.16	197,188.08	223,921.14	226,470.44

Date	ANZ cheque, savings and Westpac cheque	Barlow Fund	Kauri Fund	Grand Total
Dec 2014	1,400	74,079	94,225	169,704
Dec 2015	16,161	74,502	75,615	166,278
Dec 2016	45,548	73,552	74,080	193,180
Dec 2017	44,813	78,539	77,151	200,503
Nov 2018	48,407.42	79,514.92	85,111.39	213,033.70
Feb 2019	61,587.13	79,743.42	85,220.72	226,551.27
Jul 2019	57,623.92	82,842.84	90,130.02	230,596.80
Nov 2019	58,062.03	85,708.46	92,793.26	236,563.75

PBE SFR-A (NFP) Public Benefit Entity Simple Format Reporting – Accrual (Not-For-Profit) on the basis it does not have public accountability and has total annual expenses of equal to or less than \$2,000,000

How it was funded -	what did it cost?
---------------------	-------------------

	2018	2017	2016	2015
Revenue				
Donations	13,741			
Fees subscriptions and other revenue from members	28,644	23,972	31,537	43,819
Revenue from providing goods and services	93,572	13,690	62,658	18,924*
Interest, dividends and other investment revenue	4,491	5,982	5726	5,072

Other revenue	3,931	3,430	3498	Not worked
Total Revenue	144,378	47,074	103,419	77,706
Expenses				
Volunteer and employee related costs	14,971	12,609	8,136	11,598
Costs related to providing goods or service	104,601	36,195	42,930	Not worked
Other expenses	7,025	8,069	7,397	Not worked
Total expenses including depreciation	126,597	56,874	58,463	Not worked
Surplus/(deficit for year)	17,781	(9,799)	44,956	(12,250)

New Zealand Ecological Society (Inc.) Statement of Financial Performance for the Year ended 31 December 2018

'What the Entity owns?' and What the Entity owes'

Assets				
	2018	2017	2016	2015
Current assets				
Bank accounts and cash	124,186	81,962	58686	Not worked
Debtors and prepayments	1,955	5545	15,440	Not worked
Other current assets	46,000	66,138	136,394	Not worked
Total current assets	172,141	153,645	210,520	Not worked
Total current assets Non-current assets	172,141	153,645	210,520	Not worked
Total current assets Non-current assets Property, Plant and Equipment	172,141 3013	153,645 4,865	210,520 7,934	Not worked Not worked
Total current assets Non-current assets Property, Plant and Equipment Investments	172,141 3013 52,417	153,645 4,865 50,000	210,520 7,934 0	Not worked Not worked Not worked
Total current assetsNon-current assetsProperty, Plant and EquipmentInvestmentsTotal non-current assets	172,141 3013 52,417 55,430	153,645 4,865 50,000 54,865	210,520 7,934 0 7,934	Not worked Not worked Not worked Not worked

Liabilities

	2018	2017	2016	2015
Current Liabilities				
Creditors and accrued expenses	8,176	6,896	6,800	Not worked
Employee costs payable		-	242	Not worked
Total current liabilities	8,176	6,896	7042	Not worked

Total Assets less Total Liabilities (Net Assets)	219,395	201,614	211,413	166,457

Accumulated Funds

Accumulated surpluses or (deficits)	53,880	48,327	63,782	Not worked
Reserves	165,515	153,286	147,631	Not worked
Total Accumulated Funds	219,395	201,614	211,413	Not worked

Cash flows from operating activities

	2018	2017
Donations, fundraising and other similar receipts	13,741	
Fees, subscriptions and other revenue from members	28,644	23,972
Receipts from providing goods and services	18,283	22,621
Interest, dividends and other investment receipts	7,455	6,416
Cash receipts from other operating activities	3,931	3,430
GST	1,839	1,337
Payments to suppliers and employees	(46,817)	(54,756)
Total Cash flows from Operating Activities	27,086	3,020

Cash flows from Investing and Financing Activities

	2018	2017
Receipts from sale of investments	116,138	151,394
Payment to purchase investments	(101,000)	(131,138)
Total Cash flows from Investing and Financing Activities	15,138	20,256

Cash Balances

Cash and cash equivalents at beginning of period	81,962	58,686
Cash and cash equivalents at end of period	124,186	81,962
Net change in cash for period	42,224	23,276

Other items

Revenue from providing goods and services

	2018	2017
Conference	78,191	
Copyright Licencing Fee	3,814	340
Journal subscriptions	613	4,603
Page charges	10,954	8,747
Total revenue for providing Goods and Services	93,572	13,960

Interest, dividends and other investment revenue

	2018	2017
Interest received	751	640
Interest – Nigel Barlow	2028	2693
Journal subscriptions	613	4603
Page charges	10,954	8,747
Total revenue for providing Goods and Services	93,572	13,960

Other revenue

JSTOR 3,931 3,430

Analysis of expenses

Volunteer and employee related costs

	2018	2017
Illustrations	735	650
Secretariat	1,080	1,479

Technical Editing	13,156	10,480
Total Volunteer and employee related costs	14,971	12,609

Costs related to providing Goods and services

Accounting	2,500	3,116
Awards	4,011	6,150
Bank charges	61	213
Conference expenses	74,405	
General Expenses	2,546	
Journal promotions	15,697	19,158
Subscriptions	2,642	1,959
Travel Local	976	1,943
Website	1,744	1,655
Total Costs related to providing goods or services	104,601	36,195

Other expenses

	2018	2017
Audit Fees	2,615	5,000
Depreciation	1,852	3,069
Investment impairment	2,558	10,480
Total Other Expenses	7,025	8,069

Membership Report (by Olivia Burge)

Membership trends

It appears membership losses have plateaued after steady losses 2017 and 2018 cf 2019. With new initiatives such as the members-only section, membership benefits (currently being scoped), it is hoped memberships remain steady or increase. Slightly fewer 'new' members than last year (64 last year, 46 this year; see below for this year's new member breakdown).

Year	Total
2016	595
2017	553
2018	507
2019	509

Membership initiatives

- This year we scoped a members-only section of the website, which will allow members to check and update their details and renew their memberships.
- This means we will be able to easily check conference attendees against members has currently been an 'honesty box' system.
- We are also amending the sign up form to reduce duplicate memberships, and capture information on metrics relating to diversity (gender and ethnicity)
- Exciting members-only discount in progress (next year for confirmation).

Current members

I have (as of this morning) emailed members who are "grace" as a reminder they are currently out of membership. "Grace" members are those whose membership expired in the last 12 months. We usually include "grace" memberships in emails and occasionally expired as well, so far as I understand it.

Status	Members
Current	326
Grace	137
New	46
Total	509

Table 2: Number of members by category

New members

These members joined since 3 December 2018.

				-		
Year	Month	Full	Unwaged	Overseas	Overseas Unwaged	Tasman linkage membership
2018	Dec	1	0	0	0	0
2019	Jan	3	0	0	0	0
2019	Feb	9	1	0	0	0
2019	Mar	3	1	0	0	0
2019	Apr	4	1	0	0	0
2019	May	2	2	0	0	0
2019	Jun	3	0	0	0	0
2019	Jul	1	7	0	0	1
2019	Aug	5	9	0	0	0
2019	Sep	5	8	0	1	0
2019	Oct	12	11	0	1	0
2019	Nov	6	1	1	0	0

Table 3: New members joining by month and membership type.



Figure 1: Start date of new memberships over the past 12 months

Journal Editor's Report 2019 (by George Perry)

I am pleased to report on the activities of the New Zealand Journal of Ecology in 2019. The journal continues to receive many high-quality and diverse submissions (around 50 per year). This year there has been a discernible increase in the number of papers addressing issues at the interface of ecological and the social sciences, reflecting the currency of these issues and a flow of research from the National Science Challenges. In 2019 two standard issues will be published, alongside a special issue on mātauranga Māori in NZ ecology accompanied by a virtual issue. The journal's 2018 impact factor increased to

1.447; by comparison, the NZ Journal of Zoology, the NZ Journal of Botany and Austral Ecology have IFs of 0.673, 1.118 and 1.403, respectively.

In 2019 the NZ Journal of Ecology moved to being online only and we started using the Scholastica platform. The journal's transition to being online-only has been smooth and has reduced the cost of the journal's production. After we resolved some initial teething problems, using Scholastica has made editorial management of the journal easier. Supported by the Kauri Fund, in 2019 the journal began publishing Hot Topics, modelled on the successful initiative developed by the Ecological Society of Australia. Two hot topics are online discussing 'Threats to New Zealand's dryland ecosystems' and 'Cats and biodiversity (in NZ)'; social media responses suggest the hot topics have been well-received, with more in the pipeline. Finally, we continue to emphasise reproducible science, with authors encouraged to make data and source-code available in public repositories.

The journal's success is the result of the superb support I receive from the editorial board and the referees. Sarah Wyse (Lincoln University) joined the board in 2019, and Al Glenn and Dean Anderson stepped down; my thanks to Dean and Al for their service to the journal. During 2019 Katherine Russell resigned as technical editor. I thank Katherine for the superb work she did for the journal. James Brock has replaced Katherine as technical editor and has done a great job in working on the special issue alongside our 'normal' issues. The standard of the editorial and review process is rigorous but supportive. I am extremely grateful to the editorial board, the reviewers, the authors and the Society for their continued support.

George Perry Scientific Editor, NZJE November 2019

Te Tohu Taiao Award for Ecological Excellence, 2019-Sarah Richardson

This award is presented annually to recognise individuals who have made an outstanding contribution to the study and application of ecological science. The award is made to the person(s) who have published the best original research regarding the ecology of New Zealand or its dependencies, or to the person(s) who have made a sustained and outstanding contribution to applied ecology, particularly conservation and management.

We are delighted to present the 2019 Te Tohu Taiao award to Sarah Richardson.

Sarah Richardson (Manaaki Whenua - Landcare Research) was nominated by Jason M. Tylianakis (University of Canterbury), Mike Clearwater (Waikato University), Sue Hartley (University of York), Daniel Laughlin (University of Wyoming), Mark Westoby (Macquarie University) and David Whitehead (Manaaki Whenua Landcare Research).

From David Whitehead's supporting letter:

It is my pleasure to support the nomination of Dr Sarah Richardson for the Te Taiao Award for science excellence by NZES. I have known Sarah since she first arrived as a Post-Doctoral Scientist at Manaaki Whenua – Landcare Research and, with many common research interests, I have followed Sarah's progress closely. Sarah's major contribution is a focus on the development of a framework to explain ecological function based on plant traits, both above- and below-ground. Sarah has contributed by highlighting functional relationships between traits and ecological structure in New Zealand ecosystems and she has contributed to global meta-analyses with other highly respected ecologists. Sarah is now revealing insights by incorporating new approaches including below-ground microbial ecology and the use of molecular techniques. Development of new theoretical ideas is always followed up with demanding field observations and data analysis using sophisticated and rigorous quantitative approaches.

He goes on to explain Sarah has demonstrated, phosphorus is critically important in regulating processes in New Zealand forest ecosystems.

Sarah has a high intellectual capacity and a very impressive publication record. Her papers demonstrate both her capacity to address ecological issues in depth and her success in developing collaboration and engaging in diverse research projects. Sarah has published 80 papers and many of these are in high quality international journals with citations increasing each year during the last 10 years and 10 papers cited more than 100 times. In addition to high achievement and science excellence, Sarah has strong leadership skills. Sarah has demonstrated her abilities to develop research ideas, design observational and experimental approaches and lead large field teams in data collection and analysis. Sarah is a true 'hands on field ecologist' and encourages emerging scientists to develop strong observational skills. Sarah has worked successfully to engage well with stakeholders to ensure the relevance of her research and she collaborates closely with both government agencies and Māori stakeholders.

From Jason's nomination:

Although her entire career since PhD has been based in New Zealand, her work is firmly positioned on the world stage through publications of large-scale datasets in elite journals. These include multiple papers in Nature and top ecological journals such as Trends in Ecology and Evolution, and Ecology Letters as well as nearly annual contributions to the top plant ecological journal Journal of Ecology. In addition to this evidence of her research quality, her quantity of outputs is also exceptional and accelerating; she publishes approximately 8 papers per year! This enviable publication record has not been achieved by hiding in an office and continually writing. Rather, Sarah carries out an enormous amount of primary data collection in the field, and still finds time to produce both high quantity and quality of scientific outputs. Throughout her career, Sarah has also made it a priority to work closely with management and policy agencies who apply her research, notably the Department of Conservation and Ministry for the Environment. For over a decade, she has worked closely with the Tūhoe Tuawhenua Trust on management and restoration of their forests (including integration of their mātauranga alongside ecological research), and currently she is also working with Ngāti Hineuru.

Finally, it is important to mention some of the characteristics that make Sarah an excellent ambassador for our discipline. Despite her highly successful career, she doesn't have any hint of the ego that might accompany such a strong track record. Moreover, she hasn't achieved success by pushing to the front of the queue and claiming credit for herself. Rather, she is a humble and generous contributor, whose focus is on producing the best possible research and outcomes for science and the environment, not for her own advancement. She would never apply for an award such as this, and that is part of what makes her so deserving of it. I believe that the Te Tohu Taiao award would be an appropriate, and well-deserved, accolade for an exceptionally talented ecologist who has contributed significantly to both our ecological community and our international reputation for outstanding ecological research.

Ecology in Action Award, 2019 - Laura Young

The Ecology in Action award reflects one of the primary aims of the society: the promotion of the study of ecology and the application of ecological knowledge in all its aspects. This award was established to recognise individuals who have made outstanding contributions to the application of ecological knowledge, including communication, education and transfer of ecological science at the grass roots in NZ or the Pacific. The Society would like to recognise such individuals' achievements in promoting ecology and education, with landowners, community groups, politicians, councils and others. The society recognises the important role of the transfer of ecological knowledge in changing behaviours and achieving practical protection and restoration of biodiversity.

The 2019 Ecology in Action Award winner is Dr Laura Young.

Laura was nominated by Dave Kelly and Ximena Nelson at University of Canterbury, with supporting letters from the chair of the Kea conservation Tamsin Orr-Walker and Josh Kemp from the Department of Conservation.

From Dave Kelly and Ximena Nelson's nomination:

We wish to nominate Dr Laura Young for the Ecology in Action award. This award is designed to recognise practical on-the-ground efforts towards the science and application of ecology for conservation in New Zealand/Aotearoa. Laura's contributions fit this award perfectly, as she is knowledgeable, enthusiastic and passionate about conservation. Importantly, Laura, often working unpaid, has made major contributions in several areas, including developing innovative citizen science approaches to conservation and establishing and running the social media accounts (Facebook and Twitter) for the NZES until 2017, enabling the society to reach an audience far greater than its core membership. Laura works well with other individuals and groups to greatly enhance the status and profile of threatened species. Her work with kea is the best example of that, but is only her most recent contribution.

From the nomination letter by Josh Kemp (DOC):

A long list of noteworthy work by Laura has included a significant contribution to our nation's collective endeavour of conserving the kea, a threatened endemic parrot. First, Laura's PhD thesis and associated publication of her work on aspects the foraging ecology of kea are an invaluable contribution to ecology in New Zealand. Second, Laura has devoted substantial unpaid time over several years to radio tracking kea in the Hawdon Valley for the purpose of measuring rates of survival and productivity. Third, she was simultaneously instrumental in setting up the Kea Sightings Project, which has demonstrated the power of the internet for gathering data on kea. The project has inspired the Department to attempt an extension of the project that aims to elucidate long-term trends in kea numbers. Laura now receives some pay from DOC for her work with kea.

Laura is a rare breed in that her scientific prowess is coupled with a gregarious nature and an uncommon ability to relate to people from all walks of life. This makes her an invaluable member of a conservation team; one we look forward to working with in future.

I enthusiastically support her nomination for this award.

Outstanding Publication on New Zealand Ecology Award, 2019

NZES makes an award each year to recognize a recent publication that has made an outstanding contribution to our understanding and/or management of ecosystems (terrestrial, aquatic or marine) in New Zealand or its dependencies (including the Ross Dependency). Publications may take the form of peerreviewed journal articles, book chapters or books.

For the 2019 year, the judging panel has decided to make a joint award to these publications:

McIntosh AR, McHugh PA, Plank MJ, Jellyman PG, Warburton HJ, Greig HS 2018. Capacity to support predators scales with habitat size. Science Advances 4: 7: eaap7523.

Wehi PM, Cox MP, Roa T, Whaanga H 2018. Human perceptions of megafaunal extinction events revealed by linguistic analysis of indigenous oral traditions. Human Ecology 46: 461-470.

The first paper is exceptional as it makes a fundamental contribution to ecological theory using New Zealand data. The second is exceptional as it rigorously uses an incredibly novel and New Zealand-based dataset to forge a window into Maori ecological experience. Congratulations to these authors!

There were nine nominations for this award, providing a stellar field. The judges indicated that many of these publications were of an extremely high quality and would have been entirely suitable winners. They encourage these authors to resubmit in 2020.

Best Publication by a New Researcher, 2019

The 2019 NZES Award for Best Publication in the New Zealand Journal of Ecology by a New Researcher was awarded to Faline Drummond, Massey University for the paper:

Drummond F.M., and Armstrong D.P. 2019. Use of distance sampling to measure long-term changes in bird densities in a fenced wildlife sanctuary. <u>New Zealand Journal of Ecology 43(2): 3371.</u>

Best Student Conference Paper, 2019

Best student presentation: Aaron Bertoia, Unversity of Otago. *Monitoring lizard emergence behaviour in a remote alpine environment.*

Honourable mention: Erana Walker, University of Waikato. *Kaitiakitanga in the urban space.*

Honourable mention: Levi Collier-Robinson, University of Canterbury. Embedding kaupapa Māori principles in genomic research of taonga species: a conservation genomics case study.

Honourable mention: Olivia Rooke-Devoy, University of Auckland. *Outgrowing our Mowing: Encouraging lowcost, biodiverse lawns in Auckland.*

Best Student Conference Poster, 2019

Best poster: Isabelle Barrett, University of Canterbury. *Shaped by stress: a trait-based meta-analysis of stream communities across stressor gradients in New Zealand.*

Honourable mention: Nicholas Foster, University of Otago. *Distribution and upper altitudinal limits of invasive small mammals in a mountainous drylands tussock environment.*

2019 Barlow Scholarship - Sahar Firoozkoohli

The Barlow Scholarship was established from a bequest to NZES from Nigel Barlow, an eminent New Zealand quantitative ecologist. The Scholarship is designed to provide support to international students studying ecology in New Zealand.

This year the scholarship has been awarded to Sahar Firoozkoohli of Lincoln University. Sahar is an Iranian student currently studying for her PhD at Lincoln University with Associate Professor Adrian Paterson and Dr Jon Sullivan. Her research is determining how urbanisation can affect the morphology and behaviour of birds. Are urban birds more aggressive and greater risk-takers than their country cousins, and does the differences between urban and rural environments lead to micro-evolution within habitat-specific populations?

Congratulations to Sahar! Further details on the Barlow Fund are provided here: <u>https://newzealandecology.org/barlow-scholarship</u>

NZES Draft Sustainability Plan

The NZES council has formed a Sustainability Plan to guide the society and would like to invite feedback on it from NZES members. It is presented below. Please send us your comments to improve it! Please email your feedback to the NZES vice president, Kiri Joy Wallace: kwallace@waikato.ac.nz by 1 March 2020. When doing so, please refer to specific numbered lines of text.

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The New Zealand Ecological Society's Sustainability Statement

28 The New Zealand Ecological Society (NZES) views sustainability as an issue of 29 paramount importance. We strive to operate as a sustainable entity, respecting 30 both planetary and social boundaries. We acknowledge that the current dominant 31 economic model of growth without limits and measurement of success using GDP is 32 not adequate for humans and nature to prosper long-term. 33 34 We acknowledge the Intergovernmental Panel on Climate Change (IPCC) 2018 Special Report on the impacts of global warming of 1.5°C above pre-industrial 35 36 levels, and its call for large, immediate and unprecedented global efforts to avoid 37 and reduce greenhouse gas emissions to achieve net-zero-emissions by mid-38 century. We also acknowledge the key messages of the Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 39 40 including: 'Nature can be conserved, restored and used sustainably while other global societal goals are simultaneously met through urgent and concerted efforts 41 42 fostering transformative change'. 43 44 We feel it is our duty to reach beyond the current legal and regulatory 45 requirements to be leaders in sustainable practice. We are committed to 46 supporting NZES members and New Zealand society more broadly in making 47 sustainable decisions in environmental (i.e. ecological), economic, and social 48 contexts. We recognise these three systems are intertwined. 49 50 51 52 We define sustainability as The ability to sustain a full range of systems: environmental, economic and 53 54 social, indefinitely. 55 Web links in coloured font below define in greater detail. 56 57 Environmental sustainability is the ability to maintain rates of renewable resource harvest, pollution creation, and non-renewable resource depletion 58 59 that can be continued indefinitely. 60 61 • Economic sustainability is the ability to support a defined level of economic production indefinitely. 62 63 64 • Social sustainability is the ability of a social system, at any level, such as a community or a country, to function at a defined level of social wellbeing 65 indefinitely. 66



We will focus on four key steps towards being sustainable:

- i. Reduce the carbon footprint of our activities to net zero carbon, and encourage our members to do likewise
- ii. Advocate for ecologically/environmentally sustainable practices
- iii. Encourage the social engagement and wellbeing of our members
 - iv. Be good stewards of our finances
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To achieve these four steps we will:

79 i. Reduce our carbon footprint to net zero carbon: Aim to avoid generating greenhouse gas emissions, and offset unavoidable 80 emissions. Ways to accomplish this in the context of the NZES include: 81 82 83 a. Minimise air and car travel and instead use remote meeting methods whenever possible, including for council and the annual conference. 84 85 b. Eliminate meat from catered food consumption and instead support 86 alternatives, particularly vegetarian/vegan. 87 c. Minimise use of paper by going digital and otherwise using 88 recycled/recyclable eco-friendly office supplies. d. Follow best practice for carbon off-setting, e.g. use electric vehicles 89 90 and pay to offset unavoidable flights when booking, or via 91 accredited certification schemes¹. e. Maintain a Conference Sustainability Guide available for conference 92 93 organisers. 94 f. Encourage our members to become net carbon zero by providing 95 tools and guidelines to reach this goal. 96 97 98 ii. Advocate for ecologically/environmentally sustainable practices: 99 100 a. When opportunities arise, we will make public submissions on policy or support our members to do so, including in collaboration with our 101 overseas ecological society counterparts. These will align with 102 103 sustainability as defined in our sustainability statement. 104 b. We will use our voice on social media and our website to share 105 information on sustainable practices with the public and our 106 members.

¹ For example: <u>https://ekos.org.nz/; https://calculators.enviro-</u> mark.com/public?calculator=travel.

107 108 109 110 111 112		c. We encourage members who are not also members of the Royal Society of New Zealand and/or the Environment Institute of Australia and New Zealand to abide by the sustainability provisions of the codes of ethics and professional standards of those two organisations ² .
113 114	iii.	Encourage the social engagement and wellbeing of our members
115 116 117 118		a. We will create opportunities for our members to adopt and encourage others to adopt sustainable practices and feel empowered to promote the earth's sustainable future.
119 120	iv.	Be good stewards of our finances:
121 122 123 124 125 126		a. Ensure investment of NZES funds is ethical, excluding fossil fuel exploration, exploitation or activities that promote the use of fossil fuels and any other activities promoting environmental or social degradation.
	127 1	Monitoring, Reporting and Adaptation
120		
130 131 132 133 134	•	We will monitor our activities and outcomes via a genuine progress indicator to see that we are achieving what we aimed for. This process will be embedded into the annual review of the NZES Strategic Plan. We will review the above four steps to sustainability to ensure our progress in fulfilling them and adapting as necessary.
130 131 132 133 134 135 136 137 138 139	•	We will monitor our activities and outcomes via a genuine progress indicator to see that we are achieving what we aimed for. This process will be embedded into the annual review of the NZES Strategic Plan. We will review the above four steps to sustainability to ensure our progress in fulfilling them and adapting as necessary. We will communicate our progress to our members through appropriate channels (our newsletter, social media and emails) and use their feedback to inform and adapt the sustainability plan.

² <u>https://royalsociety.org.nz/assets/Uploads/Code-of-Prof-Stds-and-Ethics-1-Jan-2019-web.pdf;</u> <u>https://www.eianz.org/document/item/2672</u>

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147	Acknowledgements
148 149 150 151	The NZES council thanks the working group who drafted this plan: Dr. Kiri Joy Wallace, Sir Alan Mark, and Fred Overmars. We also thank the British Ecological Society, who shared documentation regarding similar environmental and sustainability initiatives, and those who have provided the website resources we have linked to within this document.

Urgent Actions for NZES

Colin Meurk

The following resolutions were put to the NZES AGM at Lincoln University on 3rd December 2019. I undertook at the time to submit these and the supporting arguments to the NZES Newsletter, so members have a chance to consider and comment. Note that when I raised these with the Minister of Conservation (Hon Eugenie Sage) following her opening address she said 'good ideas'; and Rau Kirikiri, who facilitated the launch of the Maori edition of NZJEcology, offered his support. Several members of the Society personally endorsed the proposals; and no dissenting voice was expressed at the AGM other than to note the need to develop a more refined proposition before taking to a wider audience including Government. So, at this stage they are general aspirations requiring elaboration of detailed intent and pathways to achieving those outcomes, which I'm personally willing to help develop.

These propositions come about through my personal experience of continual, voluntary, often futile, ecological submissions, within very constrained time limits, over many years, to governance bodies with little or no comprehension of deep ecology or strong sustainability. Too often ecological knowledge (risks and opportunities) is 'second-guessed'. Importantly, these propositions are in line with the NZES policies and mission.

The resolutions with rationale are:

First

- Given the multiple emergencies facing the planet;
- Given that all these emergencies are ecological in nature and in solution;
- Given the 30 years of QBL (quadruple bottom line) rhetoric in government, corporate, business and community arenas and yet failure of this to be implemented in Governance structures;
- Given the growing attacks on evidence-based science as an arbiter for action, and the consequent danger to life as we know it;
- The NZES shall hereafter strongly advocate for there to be at least one <u>experienced ecologist* on all governance structures</u> in the country (not as mere advisers at a tier below governance but of equal status to the roles of business, community, and cultural advocates that are almost universally on boards and executives these days).

Second

- Given current proposals to ensure all school children receive a thorough grounding in NZ history (and also now climate);
- The NZES shall hereafter strongly advocate (and contribute to curriculum) for incorporation of <u>Natural History</u> as part of that minimal education requirement for school students, immigrants and visitors to this country.
- Note: understanding of our unique biogeography and ecological dynamics is vital to our identity, the role of biodiversity in place-making (and therefore well-being), and necessary awareness/ attitudes/ management/

behaviour towards maintaining our biodiversity (we alone have that responsibility and that stewardship or kaitiaki role).

- This might be called the development of <u>ecological literacy</u> as a vital part of our education about our <u>total history</u> and the cultural-environmental synergy and imperatives that follow.
- I am presuming NZES already tacitly supports the initiative for full history teaching in schools, so this proposal merely elaborates an essential part of that comprehensive education that understands connectivity between history, nature, culture, whenua, and landscape.

*Definition of an 'experienced ecologist' may need some work – but it is apparent that there at least 2 streams of ecological wisdom – reductionist, big data modellers; and holistic natural historians. Many of the issues that governing bodies get wrong relate to not understanding or knowing the interrelatedness of factors and consequences of actions, but also the minutiae (beyond the charismatic vertebrates) which are nevertheless critical to whole ecosystem biodiversity and function, and ultimately to legible, connected landscapes, and place-making. This will raise the issue of professional registration of ecologists and the criteria for that – as for RMA commissioners.

NZES Hot Topics

The third NZES Hot Topic was published online in January 2020:

One Billion Trees: an opportunity for (re)building resilient and multifunctional agricultural landscapes

Synthesis by: Dr Bradley Case, Auckland University of Technology (bradley.case @ aut.ac.nz)

This Hot Topic is available on the NZ Ecological Society website at <u>https://newzealandecology.org/one-billion-trees-opportunity-rebuilding-resilient-and-multi-functional-agricultural-landscapes</u>

NZES aims to improve communication of science from the conservation and ecological community within Aotearoa New Zealand to the people of NZ. NZES Hot Topics was established in 2018 as an initiative of the Kauri Fund. The Hot Topic reports aim to provide a robust source of ecological and conservation science to counter misinformation and evidence complacency. NZES Hot Topics is governed by an editorial team consisting of New Zealand-based ecologists George Perry and James Brock. More information about Hot Topics, and the previous two Hot Topics can be found here https://newzealandecology.org/nzes-hot-topics

Reasons to be cheerful

This is a version of a talk given by Dave Kelly at the NZES conference dinner at Lincoln on 4 December 2019. It looks at psychology and recent science to try and find some positive angles on the apparently depressing state of the world.

I was asked last week if I could speak at this dinner and spent some time wondering what you would like to hear about. I went through several ideas, but

as I've sat through various talks at this conference it seems to me there are a whole lot of vaguely depressing things, so I decided to try and perhaps cheer everyone up a bit, or at least help us to understand what's going on even where we can't fix it. The talks have been very good but they have covered basically depressing stuff, like Susan Walker's excellent summary of biodiversity loss in the Mackenzie Basin and how the Resource Management Act (RMA) is failing to protect biodiversity precisely because it was written to look good but ultimately not obstruct development. Similarly, Paul Dutton showed that in the southern Waikato, their district plan on paper appears to protect native habitats, but in fact it's not enforced and losses continue. We had David Bowman from Tasmania describe the situation with wildfires in Australia, Chile, California, and the situation looks apocalyptic. And more generally, climate change has been looming over this whole conference, it's a factor in so many of the problems we face. The UK Guardian newspaper has a story about how scientists deal with "environmental grief" watching nature being destroyed. So how do we deal with all this and not get too depressed?

What I want to cover is some information and books that I found helpful, so I don't worry quite as much about these things as I used to.

First, I want to talk about **some successes**. We have these, but we tend to focus more on bad news than good news, it's a hard-wired human tendency. An example is Colin O'Donnell who said to a journalist that pest control in the Landsborough Valley was going really well, and the otherwise-rare monua is the most common forest bird there. The journalist said "well, not much of a story there", so it didn't get the publicity that negative stories do. It's easy to forget about all the things we can do now that would have seemed magical 40 years ago: GPS, DNA technology, R free stats software, radio tracking, the list goes on. There was a recent paper (Bell et al. 2016) about the legacy of the Big South Cape invasion of ship rats in 1963, which led to the extinction of Steads Bush Wren and the greater short-tailed bat and nearly the South Island saddleback. The paper says Big South Cape was a tragedy that shaped a generation of ecologists, it certainly had a big effect on me. But the key point is, if that happened today dealing with it would be trivial. We would get in there and knock the rats off again in no time and we would not lose species, as we did then. That's the advancement of technology.

So, we should remind ourselves about what we have got better at, things we are doing well on. Which leads me to a comment about a series of papers out of Hugh Possingham's group about prioritising species for conservation action, such as Joseph et al (2009) which talks about New Zealand species. The punchline of that paper is that if you take a long-term view, we should spend money not on the most threatened species, but on the species that are cheapest to fix. The premise is that more species are moving to higher threat levels all the time and we can't keep up, so you save most species for a given expenditure if you concentrate on the most cost-effective cases. In other words, give up on kākāpō, they cost too much. But buried in the fine print is an underlying assumption that we are not getting systematically better at doing conservation work, which in the paper is worded as the chance of spontaneous recovery being low. Remember they are talking about 30 to 50-year timescales here, so to me that assumption that we are not going to get better at saving species more cheaply just seems ridiculous. I would say spend the money on the most

threatened species, and keep them all alive for the next 10 years by which time we will have better tools to save them, and the other species. So, I don't understand how these Possingham papers can be so widespread when they are ignoring the role of advances in technology, which fundamentally alters the conclusion, I think.

My second point I'm calling the "Attack of the killer accountants", this is what Susan Walker called rational self-interest. Where for example dairy farmers put in irrigation, and it causes problems for terrestrial biodiversity and streams and so forth, which is bad for the community but good for the profitability of the farm. The problem is that we have got too good at focusing on money, to the exclusion of everything else. In Christchurch, the Edmonds Factory, which had the "Sure To Rise" sign on the roof famous from thousands of cookbooks, built a very pretty community garden next door which they created for the wellbeing of their workers and the community. Nowadays if a company tried to do that, the shareholders could sue the directors for spending money on something other than shareholder profits. We now focus on money above wider community benefits. The only control really on this is what is called "social licence", where social pressure can stop businesses doing things that are legal but unpopular. Fonterra recognises this and is making some moves to clean up environmental impacts. Social licence is a weak lever to achieve change but it's there, and of course we could also push to change the RMA to make biodiversity a higher priority than it currently ends up being. It's easy to forget that there has been a general tend towards wider progress, well documented by Steven Pinker in his 2018 book Enlightenment Now. He shows we are making progress very generally: less violence, more tolerance, better protection of the environment, and so on. Again, we take this big-picture positive story for granted and focus on the short-term negatives. It used to be acceptable to throw your sewage (bedpan) out into the street but we don't do that anymore. With luck, in the near future it won't be acceptable, or legal, to ruin a nearby stream or clear threatened vegetation.

My third point is about distrust of authority, or fake news, or **misinformation**. Opposition to 1080 is one example, anti-vaccination is another. What's going on? I trace it back to what Putnam (2000) calls social capital. This is basically the sum of positive interactions among the people in an area. Do you trust your neighbours, do you spend time volunteering, all that sort of thing. Social capital is what makes life in a community worth living. Putnam looks at how social capital changed in the USA from the 1920s on, and he found it increased until about 1960, then has declined ever since. The only factor he could find which was associated with this decline was watching television. The more that people's view of the world comes through television rather than direct face to face contact, the more they see negative stories from wider afield, and the less they trust people. Because the TV is a profit-driven intermediary and recognises the greater interest in negative stories. So TV shows you the worst stories from anywhere on the planet, but not the acts of kindness in your own town. Social capital is also declining in NZ, as evidenced by high fences around houses, tinted glass on SUVs, road rage and so on. Remember Putnam was writing before Facebook and so on but that has only made things worse. Facebook is a bit of a monster, because like TV it's profit driven and hence focused on negatives to exploit fear, but it is also unethical and it knows a lot about you, and uses that to play on your particular fears, and to offer you stories – true or not – which

pander to your prior inclinations. Facebook is a problem and I note that at the AGM the NZES sounded pleased to have more people using our Facebook page. I think that's an important job to do, reaching members and non-members electronically, but I wish there was some other company we could use to do it because I think Facebook is a uniquely unpleasant and dangerous way of doing what we do there.

We also need to bear in mind that reaching people through electronic media like Facebook is different from reaching them in person. In-person communication is much stronger and more positive. There was a marvellous talk in the conference by Hayley Alena from Auckland University about Herald Island, a suburb of Auckland, on why people join the community pest control group. It turned out the most important motivation for people volunteering for this was not to improve conservation (although they supported conservation) but primarily to make social connections. They wanted to know their neighbours and feel connected to the community. It's about building social capital. As we look to promote and support NZES and ecology generally, we must bear in mind that these things are done far better through human contact than electronic means. And I suggest that a lot of the problems with distrust of authority, and fake news, come from people who get most of their information from impersonal sources which have a commercial bias in showing them scary things, and in the case of Facebook also things that they already agree with (true or not).

My **final point is on climate change**, which has been hanging over this whole conference, it's hanging over the whole of western civilization at present. This is depressing. I'm looking for some messages of hope here, which is hard, but here are some of my thoughts.

Firstly, I think on climate change, humans are going to suffer more than other species, which may be some sort of good news to those other species. That was exactly what happened with the Christchurch earthquakes, we broke countless buildings and underground pipes but nature carried on. The godwits moved to another place with the right water depth, some trees were hit by rocks, but nature takes these things in its stride. I think the major impacts to other species will be indirect ones, for example where humans have to clear more land for agriculture because previous areas are suffering drought. The Australian fires at present seem to be a counter-example with lots of burnt koalas suffering, but my point is that species are surprisingly well dispersed and have coped with lots of environmental change in the past. They don't need us as their nursemaids, but we could at least stop harming them directly.

Secondly, humans often do the right thing, but only at the last minute, and – as Winston Churchill said about the Americans: "only after exhausting all other options". So maybe we will start a crash course in reducing emissions, after decades of delay. I remain hopeful, we can't say it's too late yet. I was cheered up by reading Future Babble by Dan Gardner (2011), this is a book about human psychology. It shows humans desperately want predictions and like to think they are accurate. Even after the event when predictions are proved to have been wrong, as they often are, we twist things and remain convinced we did know beforehand what was going to happen. These are psychological biases, the book is very interesting about that. The book has a couple of ecological examples, one is Paul Erlich's 1968 book "The Population Bomb", which said that

the human population was increasing out of control and the 1970s would see inevitable huge human famines. None of that happened. Another example is oil prices, which many people, including me, thought were going to skyrocket when we reached "peak oil" about 2010. That hasn't happened either, because of fracking and other things we didn't forsee. Reading this book made me more optimistic. Predictions need to be considered seriously, but they are not inescapable fates, so I am more open to the idea that disaster could well be averted.

This leads to the next book, #NoFly by Shaun Hendy (2019), a physicist at Auckland University.



In 2017 he was worrying about climate change and wondering why society was not taking more action about it. Of course it's not true to say people have done nothing about climate change, since 1990 we have actually got much worse – we fly more, drive bigger cars, emissions are higher than ever. So Hendy wanted to make positive changes. He also realised that scientists have a worse carbon footprint than the average person because we fly so much for work. He calculated he had flown 88,000 kilometres in 2017. So he decided to do something about it and not fly at all in 2018. The book is about why he did that, and how he did it. It's a surprisingly interesting book and only \$15, I recommend it.

One of the key things about climate change is people feel helpless, because change needs to be at the country or global level, what can one person do? But I think the remedy to feeling helpless is to take power back by doing something. We can't save the world alone, but we can make positive changes individually which is useful for three reasons. Firstly it is very empowering, you stop feeling helpless. Secondly, it's contagious. Hendy's NoFly plan inspired a colleague at Auckland to also have a NoFly 2018, and the more people talk about this, the wider those ideas for action spread. Remember, face to face discussions are the most persuasive thing for people, we are social animals. Thirdly, those decisions collectively will start to affect the options we have. Hendy decided he was not going to fly from Auckland to Christchurch for meetings, and he wasn't going to drive because one person in a car has a similar carbon footprint as flying (in a typical NZ car which is quite fuel-inefficient). So Hendy was often on the uncomfortable overnight bus, because there's no overnight train, because there's not enough demand. If we all look for ways of getting there overland instead of flying, there will be more train and bus options and that will make it easier to not fly.

So what should you do? Treat it like a science experiment. Estimate your current carbon footprint, that's not easy, but *https://www.toitu.co.nz/calculators* is a local carbon calculator and one of the better ones. That should give you some information about what would give you the biggest easy reductions, which are most likely things around changing diets, driving less, and flying less. Next, understand that you cannot get to carbon zero right away, that's impossible. Just aim to reduce next year's carbon footprint by say 20%. Gradually decrease

it, make changes one at a time. It's achievable and almost fun. Don't feel discouraged for not being perfect, just be better.

So what kind of things can we do? Diet counts, as meat and dairy are big global warming contributors. This 2019 conference is the first nearly totally vegetarian NZES conference, which is great – especially since I'm vegetarian! But that doesn't let me off the hook for climate change as I eat dairy products. If you can reduce your meat intake a bit, and your dairy intake a bit, that helps climate change. A new paper by Drew et al (2020) gives NZ-specific numbers for the carbon impact of various foods.

What about cars? This is where I start offending people. If you have a private car, do you know your actual fuel economy? Not the car's rating, but what you get? If not, you should. And if it's more than 5.5 litres/100 km, you could have a better car. One of the odd things about ecologists is we care about the planet, but we also love four-wheel drives. I have lots of friends who have 4WDs, even though they only drive on sealed roads and good gravel roads which a normal car would cope with, using 20-50% less petrol. A 4WD is only essential for driving through deep mud off-road, which none of my friends do. If you use it for skiing, take a 2WD and put on chains, which takes 10 mins longer per ski trip but saves fuel all year. Other friends have big wagons because they love being able to throw lots of stuff in the back without having to pack it carefully. I think what this tells us is that fuel economy is about the second or third most important thing when we choose vehicles. I think it's about time it became the most important thing.

Of course even better than getting a very fuel efficient petrol car is getting an electric vehicle (EV). I've had an EV now for four years and EV owners can get boring as they become so enthusiastic about it. But I can say that people wondering about getting an EV have a bunch of questions and you know, none of them actually matter. All you need to know is that EVs work. The batteries give no trouble, in fact the cars generally give no trouble, there's almost nothing to go wrong. Two years ago the Nissan Leaf was the most reliable car in New Zealand. EVs cost very little to run, ours is 3 cents/kilometre for electricity. And you get a huge sense of smugness when driving it, smugness descends on you like a halo.

Interestingly people worry about range all the time, how far can the EV go on a charge, but it really doesn't matter. Our first EV was the cheapest, smallest, shortest range one you could buy, a \$12K Mitsubishi iMiev which had a range of about 100 km. For 18 months it never left Christchurch but we did 14,000 km of town driving, and it never gave any trouble. EVs are great in town, and town driving turns out to be a big fraction of most people's driving. We were so pleased that we replaced the iMiev with a new Renault Zoe with 250 km range for four times the price, and yes we can drive to Dunedin if we want to, but it was not economically rational. The smartest way is to have a cheap EV for town use, and just keep your petrol car for out of town (or swap the EV with a friend's petrol car for the weekend). That's very simple and cheap and has each car doing what it does really easily.

If you do want to go out of town in an EV, it's an adventure, you are a pioneer. Nothing is standardised, there are different types of chargers, different types of plugs, some are free and some you have to have signed up for. To drive the Zoe to Hokitika and back we had to take four different types of cable. So before leaving town, do your homework. There's a great app, Plugshare, which makes that easy. Driving EVs between cities is going to get easier as more charging stations are built, but you don't need to ever take an EV out of town to get most of the benefits from it.

People say electric cars are expensive, and it's true, but you know the weird thing, all cars are expensive. I did this graph (Fig. 1) in 2009 before EVs came out, showing fuel economy versus price (log scale!) for all cars sold new in NZ at the time. Note that the more money you spend on a car, the more fuel it uses. So for generations, people have been happy to spend a lot more money to get a car that was faster, or bigger, and cost more to run. Why is that regarded as normal, but spending more money to get a car that costs less to run (and saves the planet) is strange? The debate about the cost of EVs is very, very peculiar in that respect, because we never see similar debates about how soon the extra cost of a bigger engine would pay for itself (answer: it costs you more to run, not less). In just the same way, people worry about whether fitting a solar water heater or photovoltaics on their house will pay for itself fast enough, but nobody ever asks that about a renovated bathroom, because it never pays for itself at all.



Figure 1: Fuel economy (official rating) and NZ new price (thousand \$, log scale) for all new cars on sale in New Zealand in August 2009. The regression line (shown) is highly significant.

The bottom line, though, is that EVs work. Over the last four years, my partner Katrina and I have reduced our car-generated CO2 emissions from 4.1 tonnes to 0.73 tonnes/year (an 82% reduction), even while we take more holidays by car instead of flying. Initially we had a 4WD and a small car; now we have a small car and an EV (which does half our total kms). So if you own two cars, sell the bigger one and buy a cheap Nissan Leaf; it will be the easiest and happiest 2 tonnes/year of CO2 savings you'll ever make.

Air travel is the last thing, and this is hard. George Monbiot's book Heat (2006) looked at whether it was possible to make the UK carbon neutral, and air travel was the only thing he couldn't make work. But remember, you aren't trying to

go carbon neutral overnight, only to reduce your carbon footprint. How often do you fly, and how far? The longest flights are the worst. I have friends now who fly around the world all the time, friends who fly around New Zealand every week for work. So look at that and try to reduce your own flying. Some people buy offsets for their flights, but I can't escape the feeling that the offsets are a con. They don't make flying somehow OK. We might be supporting forests that were growing anyway, we might be planting trees that take 80 years to pull the carbon out again and meantime it has been warming the planet. My feeling is that we cannot just buy offsets and keep on flying, we need to fly less.

Of course scientists do need to travel, such as to overseas conferences, especially before they have good contacts overseas. Perhaps we need Kelly's law, which I just made up: the interval between overseas conferences should be your age divided by 10. So 30 year olds go every three years, 60 year olds only every six years. Something like that. We should go back to the 1980s, when it was a "Big Thing" to go to the northern hemisphere, not a trivial trip.

Which leads me to how that affects NZES conferences. What is their future in a carbon-constrained world? I've come to these conferences almost every year since 1983, and I love them. What I love most, there's good science, but most important is the social interactions. NZES is a kind of family, I find it very inclusive, and there are friends I only catch up with at conferences. I get to know new people every time. I don't know how other people find it, but I hope they also find these meetings inclusive and welcoming. There's a new movement called Kindness in Science but NZES has been doing that for years already. Tonight I was touched when Sarah Richardson, on getting the Te Tohu Taiao award, said the best thing was getting it from the NZES which has so many ecologists she knows and respects. It's a family. So how does the conference reduce its carbon footprint? Does it become a live stream event that everyone watches on their computer screens at work? Some talks can come that way, like George Perry's talk from Germany at this conference. But I hope the conference remains mainly something you come to in person, because remember my first point, that human interactions are key. We don't need to go to zero carbon, just reduce it, so I think the way to do that is to firstly drop the overseas conferences before you drop NZES Conferences. Then, make this conference more of an event, don't come for one day, come for the whole thing, come overland with friends by train or EV, and tack on some other jobs on the way. It takes longer, but you know, we rush so much these days, and it's not always a good idea. Just because we can get from Auckland to Christchurch in an hour and 20 minutes (plus the time getting to and from airports, etc) doesn't mean it is a good idea to do it. With too much rushing, we lose the time to contemplate and figure out new theories and think about what really matters including saving the earth's climate, of course.

In closing, one other thing I wanted to say, was some advice from an old hand to the new researchers here for the first time. Don't be afraid to be wrong, it's the way we make progress. I've been wrong before, and will be again. We all learn from mistakes. The only way to never make a mistake is never to do anything. So don't worry about that. And if you're a new lecturer, don't worry (as I used to) about students in a lecture asking you something you don't know. Just say "I don't know, I'll look into that and tell you in the next lecture". Nobody knows everything. I felt very relieved when I realised that was OK to say.

So thank you all for coming to the NZES conference and thank you for all the interesting talks. Long may NZES go on having these great conferences.

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New Book: Invasive Predators in NZ: Disaster on Four Small Paws

Carolyn King's latest book, relevant to anyone interested in Predator-Free NZ 2050, is *Invasive Predators in NZ: Disaster on Four Small Paws* (2019), and is now available at Springerlink: <u>https://doi.org/10.1007/978-3-030-32138-3</u>.

From the cover:

"Carolyn King has written a book that is as much social and environmental history as it is excellent ecology. She describes in fascinating detail how colonists in 19th Century New Zealand created an ecological disaster that the present Predator Free initiative, at a cost of billions over multiple decades, will attempt to address. Professor King warns that the same law of unintended ecological consequences that plagued our ancestors may confront our present eradication efforts. This landmark book deserves to be read with other classics of New Zealand environmental history - Elton's The Ecology of Invasions, Guthrie-Smith's Tutira, and Caughley's The Deer Wars."

-Professor Emeritus Charles Daugherty

"This excellent book is a unique combination of history and ecology, presenting comprehensive information on the context and effects of the many introductions

of small mammals to New Zealand. It contains fascinating stories and exhaustive data on this very significant series of events, and the current and future consequences for conservation of native biodiversity. It is a highly significant and very readable book and I strongly recommend it to anyone with interests in ecology, history and the impacts of invasive mammals. —Mick Clout

Publications in the current issue of NZ Journal of Ecology (Volume 43, Issue 3) Special Issue: Mātauranga Māori

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Levi Collier-Robinson, Aisling Rayne, Makarini Rupene, Channell Thoms, Tammy Steeves

The reconnection between mana whenua and urban freshwaters to restore the mouri / life force of the Kaiwharawhara : 3390

Pascale Michel, Aaria Dobson-Waitere, Holden Hohaia, Amber McEwan, Danielle F. Shanahan

<u>Me pēhea te whakarauora i ngā repo o Ngāti Maniapoto? How do we go about</u> <u>restoring the wetlands of Ngāti Maniapoto?</u> : 3391 Kelly Ratana, Ngahuia Herangi, Tramaine Murray

<u>'Get together, work together, write together': a novel framework for</u> <u>conservation of New Zealand frogs</u>: 3392 Javiera Cisternas, Priscilla M Wehi, Nora Haupokia, Frances Hughes, Moera Hughes, Jennifer M Germano, Nancy Longnecker, Phillip J Bishop

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 <u>b.burns@auckland.ac.nz</u> so I can include it in the next Ecotones.

- Abourachid A, Castro I, Provini P 2019. How to walk carrying a huge egg? Trade-offs between locomotion and reproduction explain the special pelvis and leg anatomy in kiwi (Aves; *Apteryx* spp.). Journal of Anatomy 235 (6): 1045-1056.
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Noticeboard and upcoming conferences

New Zealand Ecological Society Conference 5-8 July 2020, Kerikeri



Website: https://confer.eventsair.com/nzes-2020-conference/

The 69th Entomological Society of New Zealand Conference

Dates: 15th – 17th April, 2020

Location: Otago Museum, Dunedin

EntoSoc 2020 brings together international researchers from universities, industry and government with common interests in insects to help solve all sorts of ecological problems, and, well, just for the fun of it. This year, EntSoc will focus on the growing evidence of global and regional insect decline, as well as conservation efforts that are being developed to mitigate this trend.

Website: https://ento.org.nz/conferences/



International Society for Behavioral Ecology Congress 2020

27 September – 2 October 2020 MELBOURNE AUSTRALIA

https://www.isbe2020.com/program/call-for-abstracts/

11th INTECOL International Wetlands Conference, Christchurch, 2020

The INTECOL Wetland Working Group (WWG) will hold the 11th INTECOL International Wetlands Conference in Christchurch, New Zealand, on 18-23 October 2020. The Chair of the organizing committee is Philippe Gerbeaux, and the Co-Chairs are Deirdre Hart, Clive Howard-Williams, Di Lucas, Aroha Mead and Shona Myers. The tentative conference theme is: Traditional knowledge and innovative science in wetland research and management. A strong Maori and Oceania cultural presence is guaranteed within and around the conference.

Stay tuned for more information! <u>http://intecol.org/node/37</u>

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(Effective from December 2019)

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