

Maintaining the Gains Puretia te Aronga



NETS2024

24-26 July, Invercargill

CONFERENCE HANDBOOK

Major Sponsors

Boffa Miskell



Biosecurity New Zealand

Ministry for Primary Industries
Manatū Ahu Matua



Otago
Regional
Council

Trade Displays



Thank you to all our NETS2024 sponsors

Major Sponsors



Biosecurity New Zealand

Ministry for Primary Industries
Manatū Ahu Matua

Boffa Miskell



**Otago
Regional
Council**

Trade Displays



Maintaining the Gains - Puritia te Aronga

Haere mai welcome to NETS2024!

It is my pleasure to welcome you to the 73rd NZBI National Education and Training Seminar (NETS) held in Invercargill Waihōpai. This three-day conference provides a multi-sectoral and multi-agency forum for discussion and debate on how we can collectively minimise the risk of biosecurity threats to New Zealand. NETS provides a fantastic opportunity to share, learn, connect, and get energised.

The theme for this year's NETS is Maintaining the Gains - Puritia te Aronga. This theme recognises the importance of tenacity in biosecurity. It connects to why we do the work we do over the long-term – keeping at it to protect our native flora and fauna, our landscapes, our people and our culture.

NETS would not be possible without a dedicated and committed Organising Committee. I would like to thank the NETS2024 team for all their work pulling this conference together – Raoul Thomas Rose Hanley- Nickolls, Sarah Irvine, Sophie Gibson-Pinn, Rachel Jones, Brent Rohloff, Richard Bowman, Jolie Hazley, Walter Field, Pat Hoffman, Sharon Trainor, Kaitlin McKenzie, and many others who have helped make NETS2024 happen.

I would also like to thank this year's major sponsors for their generous support: Biosecurity New Zealand, Otago Regional Council, Environment Southland, Boffa Miskell, and NZ Aluminium Smelters. I'd like to thank our trade display sponsors too: Rapid Spray, NZ AutoTraps, Unitec, Key Industries Ltd, and NIWA.

NETS is as much about learning as it is about networking, and I encourage you all to take advantage of this! Even if you've been to many NETS before, make sure you talk to someone new and learn about the work they do.

Help us shape the various ways we all protect Aotearoa.

Rowan Sprague
NZBI Acting President

Day 1 Wednesday 24 July 2024

- 8.00 Registration at Ascot Park Hotel
- 9.00 Mihi whakatau and NZBI Welcome
- 9.30 Tangata whenua leaders in island biosecurity and conservation. *Tane Davis, Member and Chair Rakiura Tītī Islands Administering Body, Member and Chair Whenua Hou Komiti, Ngāi Tahu Rep Kākāpō Recovery Group, Ngāi Tahu Rep New Zealand Conservation Authority, Registered member Ōraka Aparima Rūnaka.*
- 10.00 The interrelationships between conservation management, illegal pet trade, biosecurity, research, and technology. *Carey Knox, Southern Scales & University of Otago.*
- 10.30 Taupata (*Coprosma repens*) An invasive indigenous species – Impacts on the Rakiura Tītī Islands, and mahinga kai. *Corey Bragg, Kate Orwin (Manaaki Whenua; Rakiura Tītī Island Administering Body)*

11.00 Morning Tea

	MARINE	CAPABILITY	VERTEBRATES
11.40	Protecting the Top of the South from marine invaders <i>M. Seek, Tasman District Council</i>	Citizen Science: facilitating and harnessing for biosecurity <i>A. Evans, University of Canterbury</i>	Managing game animals in Aotearoa: proactive management or deja vu? <i>P. Caldwell, Boffa Miskell</i>
12.00	Combatting the vessels transporting marine pests. <i>A. Wills, Bay of Plenty Regional Council</i>	Biosecurity scientists of the future. <i>J. Hoggard, House of Science NZ</i>	Te Tari Pūreke Firearms Safety Authority <i>K. Hill, Te Tari Pūreke Firearms Safety Authority</i>
12.20	Protecting the pristine waters of the south <i>K. McLachlan, Environment Southland & J. Geange, Ministry for Primary Industries</i>	Opportunities to lift capability in biosecurity <i>R. Sprague, Manaaki Whenua Landcare Research & S. Hona, Te Puni Kōkiri</i>	Tools from the future: Using AI technology to outsmart predators <i>B. Simpson, Boffa Miskell</i>
12.40	Boosting marine biosecurity across Aotearoa – a new national campaign and a new team <i>J. Bedford, Biosecurity New Zealand</i>	Looking to the next generation - future proofing the regional biosecurity sector <i>H. Palmer, Place Group Ltd</i>	Searching for improved bait delivery systems for control of dama and Bennett's wallabies <i>G. Hickling, Manaaki Whenua Landcare Research</i>

1.00 Lunch

	ISLANDS	WEEDS	PATHWAYS
2.00	Eradicating an invader: Broad-Tailed Gecko on Rangitoto Island <i>S. Wales, Ministry for Primary Industries</i>	Velvetleaf: taming the giant or falling asleep at the wheel? <i>S. Linton, Sustainable Options</i>	Big Heads Online and the Mail Order Pest Infestation <i>M. Fea, Department of Conservation</i>
2.20	Ulva Island 2023 eradication - The challenge of maintaining its pest-free status <i>K. Ward-Allen, Department of Conservation</i>	Mid Dome: maintaining the wilding tree control gains and beyond <i>R. Bowman, Mid Dome Wilding Trees Charitable Trust</i>	Investigating the role of wildlife in emerging infectious diseases: highlighting the need for local collaboration <i>C. Niebuhr, Manaaki Whenua Landcare Research</i>
2.40	Kia mau te tītī mō ake tonu atu – Keep the Tītī Forever <i>S. King, paws4conservation</i>	Chilean flame creeper biocontrol leaps forward <i>R. Groenteman, Manaaki Whenua - Landcare Research</i>	Biosecurity And pest control In the New Zealand Defence Force <i>A. Polkanov, New Zealand Defence Force</i>
3.00	Keeping pests off Hauraki Gulf Islands <i>K. Thode, Auckland Council</i>	Untangling the vexatious vine - waging war on wild kiwifruit <i>A. McConnell, Kiwifruit Vine Health</i>	Regulating the sale and breeding of pest pets in the Auckland Regional Pest Management Plan <i>A. Hart, Auckland Council</i>

3.20 Afternoon tea

	TOOLS & MODELLING	PROJECT MANAGEMENT
3.50	Modelling the generation, viability and potential movement of lagarosiphon fragments in Lake Wanaka <i>B. Woodward, NIWA</i>	Preserving progress: prioritising weed management with limited resources <i>B. Williamson, Boffa Miskell</i>
4.10	Developing a Smart Weed Alert Tool to detect new weed incursions early <i>K. McAlpine, Department of Conservation</i>	Assessing the efficacy of Bennett's wallaby as a Judas animal <i>G. Udy, Otago Regional Council</i>
4.30	Progressing or regressing? Modelling the required inputs for a weed control programme <i>B. Rohloff, Boffa Miskell</i>	Data collection in biosecurity response: connecting all the pieces <i>N. Parmar, Ministry for Primary Industries</i>

5.00 New Zealand Biosecurity Institute Annual General Meeting

6.00 Mix 'n' Mingle

Day 2 Thursday 25 July 2024

FIELDTRIPS - please be at the venue early enough to collect your lunch packs.

Western Southland Around the Mountain - bus leaves 8.30am

An amazing trip around the sacred Takitimu Mountains. The Takitimu waka was capsized by three large waves in Te Waewae Bay. The Takitimu waka metamorphosed into the stunning Takitimu mountains of Western Southland. This field trip takes you across Southern Central Southland, past the Longwood ranges to Western Southland and the eastern fringes of Ata Whenua/Fiordland.

Stopping at the Wairaki oxbow, you will see one of the latest projects completed by the Waiau Fisheries and wildlife habitat Enhancement trust (Waiau Trust). The Waiau trust has been operating in Southland since 1996, and is a self-funding organization dedicated to creating enhanced habitat in the Waiau River catchment.

Next you will travel to Te Koawa Turoa o Takitimu to learn about Mahinga kai values, and a people's journey of reconnection to the land. Learn about the cultural significance of the Takitimu ranges and the biosecurity challenges facing the area. Then we travel around to the amazing Rakatu wetland, first restored/created in the late 1970s by the then acclimatization society, and then further enhanced by the Waiau trust from 2000 onwards. Learn about the Waiau trust and partnership – the trust that keeps on giving quietly in the background. From there, we are off around the mountain to the Burwood Takahe Centre, site of 75 years of Takahe conservation, to find out about the status of Takahe - where they have come from, and where they will be into the future. Enjoy a 'show and tell' featuring the Takahe rearing pens and the original puppet rooms for chick rearing, as well as a unique, locally designed and built enclosure fence, around an area with plenty of biosecurity in action. And finally, out to Mossburn and a view of the West and Mid Domes and commentary on the ongoing wilding tree programmes of these sites.

Otatara - bus leaves 9.30am

This field trip will take us to a variety of interesting sites in Otatara, a short distance from Invercargill. First, we'll visit Bushy Point, where the Otatara Landcare Group will show us their long-term restoration project. Next, we'll visit the unique Oreti Totara Dune Forest and our hosts will take us on a guided walk through the reserve to learn about how the land was acquired, achievements to date, and challenges. During lunch, we'll meet a group of enthusiastic young environmentalists from Otatara School.

In the afternoon, we'll head to Sandy Point Domain and hear from Invercargill City Council representatives about this highly valued site, its past and present, and their future vision for the area. We'll also hear from a local historian about the origins of some of Southland's pesky exotic species.

Koreti/New River Estuary and Kew Bush - bus leaves 10am

This trip heads off to explore the New River Estuary with freshwater ecologist Dr Jane Kitson, and 2017 Dave Galloway Innovation award winner John Taylor (weed biosecurity dogs). The Koreti/New River Estuary is a large tidal lagoon type estuary. It receives freshwater from a large predominately agricultural catchment which includes the Oreti and Waihopai rivers. The estuary has a wide range of habitats including extensive mudflats, seagrass and salt marsh areas. Historically, the estuary was a major food source for resident Māori and in recent times the focus of the very successful Spartina eradication program run by DOC with the help of some amazing dogs. The estuary has been significantly affected by urban and rural development over the past 150 years.

Then it's off to Kew Bush to explore a remnant stand of the original indigenous podocarp forest that once covered Invercargill, and is now being lovingly cared for by the local community. Explore urban pest control using hi-tech thermal optics, and next level air rifle technology. Finally, back to the Ascot for a biosecurity dog demonstration courtesy of the outstanding Wink.

DOC Quarantine and Bluff - bus leaves 9.30am

Visit the DOC Quarantine store for a special tour of this vital resource for biosecurity of our predator free southern islands. Experience a guided tour throughout the quarantine area, including talks and demonstrations from Sandy King and Karen Andrews, with their rodent dogs. Get an understanding about the vast southern and Sub-Antarctic area and its amazing taonga. Then we're off to Te Rau Aroha Marae at Bluff, greeted with a Pōwhiri before a light Kai. Experience the impressive carvings with kōrero about whakapapa and connection to the whenua. Learn about Motupōhue and the biosecurity/biodiversity work being undertaken. Can Titi survive on the mainland? Then enjoy a unique kōrero from the DOC Kākāpō Team. Hear about the great work at Ōmāui maintaining the gains with John Collins.

After that we travel to the top of Motupōhue/Bluff hill to walk about the lookout area where we can view Rakiura and Waituna wetland, and hear a talk from our marine experts about the southern undaria project.

6.00 Happy Hour

7.00 Conference Dinner

Day 3 Friday 26 July 2024

LANDSCAPE

FRESHWATER

COMMUNITY COLLABORATION

9.00	Aerial predator control- defending for 20 years <i>S. Morgan, West Coast Regional Council</i>	Aquatic surveillance and the value of early detection <i>A. Masand, MPI Biosecurity NZ</i>	Biosecurity education - increasing our eyes and ears on the ground <i>B. Cook, Tasman District Council</i>
9.20	Community-led landscape-scale pest management being delivered through the Northland Regional Council's 'High Value Areas' Programme <i>D. Morgan, Northland Regional Council</i>	Do fish like discos? Testing the Bio-Acoustic Fish Fence (BAFF) as a control tool for koi/amur carp. <i>C. Baker, National Institute of Water and Atmospheric Research</i>	Discovering and protecting Tautukua's treasures: challenges and successes seven years on <i>F. Cunninghame, Forest and Bird Protection Society - Tautuku Restoration Project Manager</i>
9.40	From locals to landscapes - our Predator Free challenge <i>J. Clark, FTP Solutions</i>	Development of an automated detection tool for incursions of invasive submerged weeds <i>D. Clements, National Institute of Water & Atmospheric Research (NIWA)</i>	More bang for our buck - The Waikato Regional Council's collaborative model with the Department of Conservation for pest animal control. <i>C. Monk, Waikato Regional Council</i>
10.00	The challenges of maintaining momentum - case studies from Crown land <i>S. Thomason, Land Information New Zealand</i>	Comparative Efficacy of Treatments for Juvenile <i>Corbicula fluminea</i> Eradication: A Laboratory Study <i>K. Thompson, NIWA</i>	Site-Led: a Partnership for biodiversity gains <i>S. Gibson-Pinn, Otago Regional Council</i>

10.20 Morning tea

WRAP UP

- 10.40 GEMS - Short Presentations
- 11.20 How is Predator Free Dunedin contributing to the national PF2050 strategy? *Rhys Millar, Predator Free Dunedin.*
- 11.40 DOC's Conservation Dogs Programme; the canine mahi supporting conservation and biodiversity efforts, now and for the future.
Angela Newport, Department of Conservation.
- 12.00 Islands: maintaining the gains. *Stephen Horn, Department of Conservation.*
- 12.20 Incorporation of mātauranga Māori in biosecurity responses of taonga species. *Jane Kitson Kitson Consulting Ltd.*
- 12.40 Call to NETS2025 and President's Closing

12.45 Lunch

WEDNESDAY 24 JULY 2024

PLENARY SESSION

Tangata whenua leaders in island biosecurity and conservation

Tāne Davis, NZOM

Tāne is a Member and Chair Rakiura Tītī Islands Administering Body, Member and Chair Whenua Hou Komiti, Ngāi Tahu Rep Kākāpō Recovery Group, Ngāi Tahu Rep New Zealand Conservation Authority, Registered member Ōraka Aparima Rūnaka.

Ko Hananui me Takitimu nga Mauka.
Ko Aparima te Awa.
Ko Ōraka Aparima te wahi kainga.
Ko Takutai o Te Titi te Marae.
Ko Takitimu te Waka.
Ko Te Moana a Kiwa te Moana.
Ko Whenua Hou te motu u o matou tipuna.
Ko Atawhuia te Hapu.
Ko Wharetutu te tipuna.
Ko Waitaha, Katimamoe, me Kai Tahu te Iwi.
Ko Tāne Davis toku ingoa.

Through the Ngāi Tahu Deed of Settlement Act.

Tāne Represents Ngāi Tahu.

2019. The NZCA. New Zealand Conservation Authority.

2006. The Kākāpō Recovery Group. Kākāpō are a taonga to Ngāi Tahu. Enhancing the mauri connection Ngāi Tahu have to Kākāpō. Tikanga, Matauranga, Kaitiakitanga, Rangatiratanga values.

1998. Ōraka Aparima Rūnaka member and Chair of the Whenua Hou Committee. Ngāi Tahu whanui to be involved with the governance, and management of Whenua Hou. Overseeing whanui visits to Whenua Hou. Assisted to create the operational, and biosecurity plan for Whenua Hou.

1998. Tāne has a lifetime connection to the Titi Islands, particularly the Titi Island known as Putauhinu. Tāne endorses this connection being a member and Chair of the Rakiura Titi Islands Administering Body. Administering a group of 18 Titi Islands returned from the Crown to Rakiura Maori within the Ngāi Tahu Settlement Act. Now known as the Rakiura Titi Islands.

2017. It is this group of islands Tāne represents the Rakiura Titi Islands Administering Body being on the Predator Free Rakiura Engagement Group. The concept of removing pests from Rakiura will be a huge asset to the Titi Islands adjacent to Rakiura. At present those islands experience Rat incursions from Rakiura, endangering the flora and fauna. The vision for a Pest free Rakiura not only will bring

back the mauri of the island of Rakiura, but will also improve as an economic asset. The effects of Pests on Rakiura is certainly taking its toll on Taonga species, and the social life.

2017. Works programme co-ordinator. It is this mahi Tāne is strongly connected to, involving Rakiura Maori with concentrating on the conservation values of their islands. Participating with Pest controls, Taonga species Recovery Programs. Enhancing the Biosecurity and Biodiversity of the islands back to their natural state. Maintaining tikanga, whakapapa, whanaungatanga, matauranga, rangatiratanga, values within the Titi whanau community. Encouraging sustainable practises with the cultural harvest of Titi.

2019. Formed the Mauri Ora Kākāpō Trust. Member of the Trust. Purpose to administer public donations made to Kākāpō Recovery.

2019. Made a Member of the New Zealand Order of Merit. Services to conservation.

Tāne is a registered and a supportive member of the Ōraka Aparima Runaka.

Tāne is currently contracted to Te Runanga O Ngai Tahu as a Works Programmes Coordinator for the Rakiura Titi Islands.

The interrelationships between conservation management, the illegal pet trade, biosecurity, research, and technology.

Carey Knox, Southern Scales & University of Otago
southernscales@outlook.co.nz

Carey is an independent ecological consultant, researcher, and wildlife photographer specialising in Herpetology (skinks and geckos) and Lepidoptera (moths and butterflies) with a focus on conservation, advocacy, educational, or research-focused mahi. Carey operates all around New Zealand working on a wide range of projects. He has 15 years of contracting experience on lizards and three years of contracting experience on Lepidoptera. He has assisted law enforcement with the identification of illegally collected New Zealand geckos. Carey has recently returned to Otago University on a part-time basis to undertake a PhD on using drone technology to locate lizards in inaccessible habitats throughout Aotearoa.

This plenary talk will cover the interrelationships between conservation management, the illegal pet trade, biosecurity, research, and technology. Firstly, I will describe how I was introduced to the beautiful jewelled geckos on Otago Peninsula, leading to a fascination with this species and an MSc in Ecology at Otago University. From this I will outline how professional wildlife smugglers illegally removed geckos from one of my study sites, and my role in identifying and repatriating these geckos. This will lead onto how I have assisted the police, Department of Conservation, various Wildlife Enforcement agencies (both nationally and internationally), and courts with identification of individual jewelled geckos, assisting with prosecutions and repatriation of geckos on multiple occasions.

I will also discuss the major threats to New Zealand lizards, and a key focus of my career on improving knowledge of rare, threatened, and 'data deficient' lizards across the South Island. This work has led to many discoveries, including new species such as hura te ao gecko and Matura skink.

I will then outline my current work focus and future plans, including my part-time PhD project on the utilisation of drone technology to detect, survey, and monitor lizards in remote, inaccessible terrain. I will provide an update on this research with photos and video, outlining progress to date and future applications of the technology.

Taupata (*Coprosma repens*): An invasive indigenous species and impacts on the Rakiura Tītī Islands

Corey Bragg, Rakiura Tītī Islands Administering Body

Co-author: Kate Orwin, Ecologist, Manaaki Whenua – Landcare Research

Corey (Kāi Tahu, Ngāti Kahungunu) is a Member of the Rakiura Tītī Islands Administering Body, Project Manager with Te Rūnaka o Awarua, and past member of the of the Kia Mau Te Tītī Mō Ake Tonu Atu – Keep the Tītī Forever research project, University of Otago.

In 2023, the Rakiura Tītī Islands Administering Body and Manaaki Whenua held a one-off research wānanga for Rakiura Māori (Kāi Tahu; Kāti Māmoe) to come together to share mātauranga (traditional ecological knowledge), and first-hand experiences of taupata (*Coprosma repens*), an invasive indigenous plant present on the tītī islands surrounding Stewart Island. General consensus and feedback from whānau is that this plant is invading new islands, outcompeting native flora, and impacting the ‘manu’, breeding ground of the tītī (muttonbird, sooty shearwater, *Ardenna grisea*). One whānau member has described the taupata situation as an ‘ecological disaster’. As kaitiaki, taupata is presenting a new challenge for Rakiura Māori - threatening the ecology of the islands, and potentially, the future sustainability of one of the most iconic and culturally significant mahinga kai practices across Aotearoa. *Te Weu o te Kaitiaki* researchers will provide an overview of the current situation, share preliminary research results, and possible options for future management.

MARINE SESSION

Protecting the Top of the South from marine invaders

Mitch Seek, Tasman District Council
Mitch.seek@tasman.govt.nz

Mitch is a Biosecurity Officer with the Tasman District Council. He specialises in contract management, pest plant surveillance, and marine biosecurity. Mitch has spent his life in and around the ocean, and is passionate about protecting the marine environment from invasive threats.

The Top of the South Marine Biosecurity Partnership is a collaboration between local councils, iwi, MPI, DOC, port companies, and the aquaculture industry. The partnership enables effective marine biosecurity across the whole of the Top of the South (TOS) through marina dive surveys, summer vessel dive surveys, and educating marine users. Some key outcomes include eradication of sabella/Mediterranean fanworm from Port Tarakohe and detection and rapid containment of vessels harbouring Mediterranean fanworm.

Combating the vessels transporting marine pests

Andy Wills, Bay of Plenty Regional Council
andy.wills@boprc.govt.nz

Andy is a Biosecurity Officer at the Bay of Plenty Regional Council and part of the council dive team. He completed a Diploma of Marine studies at Toi Ohomai and a Bachelor of Applied Science at Auckland University of Technology. Andy has always had a real passion for the Marine environment and has spent his life working around it including dive instructing in Australia, crewing on superyachts around the world, and for DOC and the Waikato Regional Council on the Coromandel. In his current role, Andy loves that he gets to carry out regular dive surveillance to protect our precious marine environment.

The Bay of Plenty Regional Council dive team use a number of techniques to combat the vessels transporting invasive marine organisms. We work with the marinas and mooring officers to track the movements of domestic vessels. When a vessel is found with Mediterranean fan-worm on her hull the team now use a containment net to catch any fan-worm which drop while the vessel is being lifted out of the water. After one incident 249 fan-worm were collected from the sea floor after they had ejected themselves from their tubes while the vessel was being lifted. The technique of wrapping and chlorine dosing vessels with Marine Pests which are too large to lift out of the water will be explained.

Clamping down on the practice of vessel scrapping is vital. Examples will be shown of the massive underwater clean-up effort which resulted from a scrapping events. Using a range of techniques we have been able to stop the spread of a number of marine pests in the Bay of Plenty.

Protecting the pristine waters of the south

Kathryn McLachlan, Team Leader Marine, Environment Southland
kathryn.mclachlan@es.govt.nz

Jen Geange, Senior Adviser, Biosecurity New Zealand
Jen.Geange@mpi.govt.nz

Kathryn is the marine team leader in the biosecurity team at Environment Southland. During her two and a half years in this role she has lead the \$2 million Jobs for Nature Fiordland Undaria Control Programme, and has overseen the marine biosecurity, compliance, and diving operations. Prior to that, Kathryn worked in the policy and compliance teams at Environment Southland, and completed a Master's Degree in coastal science at the University of Otago.

Jen is a Senior Adviser in the Marine Pest Management area within Biosecurity New Zealand, and currently the BNZ rep for both the Top of the South and Fiordland Marine Partnership programmes. Jen has extensive knowledge and involvement in the management of Undaria in Fiordland, and has been involved in a vast range of marine projects including the development of the Fiordland Marine Pathway Plan, and suction dredge trial. Jen is very passionate about the marine environment, and a keen free diver.

The coastal waters of Murihiku Southland are home to a rich and diverse range of marine species. From the secluded fiords to the vast, undisturbed waters of Rakiura/Stewart Island, Environment Southland is responsible for protecting globally significant biodiversity, as well as iconic species of

cultural, environmental, recreational and commercial value. Boasting the longest coastline of any region in New Zealand, managing the biosecurity threats to these unique and pristine waters, is complex and comes at a high financial cost. This presentation provides an overview of the marine biosecurity programme in Southland and takes a deep dive into the long battle of managing *Undaria pinnatifida* in the Shadowland, Fiordland.

Marine pests are managed under the Southland Regional Pest Management Plan and the Fiordland Marine Regional Pathway Management Plan. There are a range of complimentary work streams to implement these plans, including compliance, surveillance, vessel inspections, and pest-specific programmes. One of the largest is the progressive containment of *Undaria* in Fiordland. *Undaria* was first discovered in Te Puaataha/Breaksea Sound in 2010, and there has been a joint-agency response between Environment Southland, Biosecurity New Zealand, and the Department of Conservation, ever since. Current control measures are geared towards physical removal by divers at the known incursion sites, with significant progress made between 2021 and 2023, via a \$2 million Jobs for Nature funding injection, and suction dredge trial. Now, more than ever, it is critical that funding and effort is sustained to ensure these significant gains are not lost.

Boosting Marine Biosecurity Across Aotearoa – a new national campaign and a new team

Jackie Bedford, Biosecurity New Zealand
Jackie.Bedford2@mpi.govt.nz

Biosecurity New Zealand is leading the implementation of a new national programme to deliver more effective management of domestic marine pests and pathways. This programme will underpin and strengthen pest-specific responses and management programmes, support the work of regional marine biosecurity partnerships, and grow support for marine biosecurity. It is focussed on two key workstreams: a national behaviour change campaign ‘call to action’ for marine biosecurity; and investing in the development of new tools and capability. Biosecurity New Zealand has brought together a new team to drive this important partnership programme.

CAPABILITY/PLANNING

Citizen Science - facilitating and harnessing for biosecurity

Abigail Evans, University of Canterbury
abigail.evans@canterbury.ac.nz

This presentation is developed in cooperation with Environment Canterbury.

Abigail is the project manager for Find-A-Pest, based at the University of Canterbury.

Biosecurity staff can't be everywhere, looking at everything, but the public is out there, and can present an excellent opportunity for data gathering. How can we utilise this resource to better understand existing pests and emerging threats? Budgets are always stretched, but how can we be

efficient and effective? Collaboration and harnessing citizen science is key to ensuring we have effective pest databases that can be used by everyone in biosecurity.

Abigail will discuss how Find-A-Pest contributes to the collaborative citizen science model for biosecurity, and advances that have been made in the last two years.

Biosecurity scientists of the future.

Jane Hoggard, House of Science NZ
jane.hoggard@houseofscience.nz

Jane has been part of the House of Science management team since 2015, and has created many of the incredible science resources in the charity's growing primary school resource kit library. She has the best job - researching, planning, and trialling all the exciting activities in the popular hands-on kits. Her work at House of Science has recognised internationally, winning the Horizon Prize for Education from the Royal Society of Chemistry (UK) in 2022.

House of Science is on a long-term mission to inspire the next generation of scientists. This charity empowers school teachers to deliver engaging, hands-on science lessons. Some of the bilingual House of Science resource kits include biosecurity messages, from identifying brown marmorated stink bugs, to understanding threats to our native forests. Jane will provide an overview of the kit design process within a biosecurity context and explain the impact these kits have on students in classrooms all over Aotearoa New Zealand. Fostering our children's curiosity now will pay dividends well into the future.

Opportunities to lift capability in biosecurity

Rowan Sprague, Manaaki Whenua - Landcare Research; NIWA
Spraguer@landcareresearch.co.nz
Shane Hona (Te Puni Kōkiri-Ministry for Māori Development) and Rowan Sprague (Manaaki Whenua Landcare Research)

Rowan is a Science Knowledge Broker at Manaaki Whenua - Landcare Research, where she helps translate research to policy makers and end-users. She has a background in science, having done her PhD at Lincoln University on wilding pines. However, she's found that the part she really enjoys about science is helping apply it. She loves working with people and finding ways to facilitate a two-way flow of information and knowledge between scientists and practitioners.

Shane has a varied background in biosecurity and primary industry, including forestry industry and research both in USA and NZ, biocontrol of weeds, contract work for the Environmental Protection Authority, biosecurity at local government level, and a stint managing a safari company in Botswana. He is currently employed by Te Puni Kōkiri / Ministry of Māori Development, with a primary focus on employment.

When we started working in biosecurity 5-10 years ago, we had to learn a lot on the job. While the NZ Biosecurity Institute (NZBI) members are very friendly and supportive, there wasn't a formal system in place for training or mentorship. In this presentation, we will discuss two opportunities to upskill: the cadetship programme through Te Puni Kōkiri, and the NZBI mentoring scheme.

The cadetships programme administered by Te Puni Kōkiri allows us to partner with employers to fund training and development, and pastoral care for Māori staff at any stage of their careers, to help them move into higher-skilled and better paid roles. The environmental field, including biosecurity, is a current priority for this fund, and cadetships enable Māori staff to develop new skills, improve confidence and leadership abilities, and should lead to better employment opportunities.

The NZBI mentoring scheme was launched this year to support early career development, and pass on knowledge from the many years of experience of our members. In this presentation, we'll talk about how the mentorship scheme works, and will seek feedback on ways to improve it.

Both of these opportunities offer a chance to collectively learn and share knowledge from experiences, so we aren't all starting from scratch, and we can ensure that we have the skills as a sector to maintain and improve the gains we've made.

Looking to the next generation - future proofing the regional biosecurity sector

Hannah Palmer, Place Group Ltd
hannah@placegroup.co.nz

Hannah is an environmental consultant for Place Group Ltd who has particular experience in working on multi-agency projects to deliver shared outcomes in the biosecurity, biodiversity, and wider environmental fields. She enjoys finding ways to simplify operating environments, improve effectiveness, and create efficiencies and outputs that make a difference. Hannah has been managing the EPA permissions process for aquatic herbicides on behalf of the Regional Biosecurity Sector since 2013, and was co-author of successful business cases to the Central Government on simplifying the regulation of aerial 1080 operations, and increasing the effectiveness of wallaby management and control in New Zealand. Outside of work, Hannah enjoys tramping, and identifying and photographing bugs.

The Biosecurity Working Group (BSWG) recently identified that across the regional sector there have been challenges in attracting good talent to the biosecurity industry, retaining these people, and ensuring they have a clear pathway for progression throughout their careers. Some regional council staff have also observed that it is becoming more difficult to fill vacant biosecurity related roles, and the breadth of experience and knowledge that applicants bring to a role is declining. Place Group Ltd explored these challenges and provided recommendations for the sector on training and succession planning. Hannah will give an overview of this work, with a view to building the next generation of passionate and capable biosecurity officers.

VERTEBRATE

Managing game animals in Aotearoa - proactive management or deja vu?

Pete Caldwell, Boffa Miskell
pete.caldwell@boffamiskell.co.nz

Pete is a biosecurity consultant at Boffa Miskell, based in Christchurch, and is responsible for managing various landscape-scale biosecurity projects. His expertise and passion for protecting our whenua is based on managing pest plants, pest animals, and valued introduced species to create better environmental outcomes for the taoka and people of Aotearoa.

Game animal abundance was reduced significantly in the mid-1900s across many New Zealand landscapes. Game animal numbers are again on the rise, and there is a risk that without proactive and consistent management, we may again see game animal densities beyond what the environment can sustain. However, managing multiple game animal species across numerous land tenures, and at a landscape-scale, has many challenges. The views of key stakeholders (hunters, conservationists, iwi and those with commercial interests) should be considered to understand what values are present, and how management can best be undertaken to protect those values. Using the upper Rakaia River catchment as a case study, this presentation explores the challenges and opportunities relating to game animal management in Aotearoa.

Te Tari Pūreke | Firearms Safety Authority

Kendra Hill, Te Tari Pūreke | Firearms Safety Authority
kendra.hill@police.govt.nz

Co-author: Ewan Kelsall

Kendra is a Senior Partnerships Advisor at Te Tari Pūreke. Some of the portfolios she covers are farming, pest control, hunting/hunting guides, rural, health and wellbeing. She is responsible for educating, engaging, and partnering with key stakeholders and communities, to facilitate conversation on key issues.

Firearms are legitimately used every day by New Zealanders for hunting, pest control, gathering kai, sport and recreation. There have been several changes to legislation over the last few years that have impacted firearms licence and endorsement holders.

We recognise that the environment we operate in is complex and multi-faceted. There are many groups we work with, and we want to help licence holders stay ahead of legislation and regulation changes.

Below is a summary of information relevant for the NETS conference audience. With a new government in place and potential changes ahead, this content may be added to or amended as appropriate.

Transport and storage

Firearms and ammunition must be concealed from view from outside the vehicle. Firearms must be made inoperable if readily possible by removing the bolt or other vital part or fitted with a trigger

lock or travel in a locked case. Ammunition must be stored separately from any firearms and be in a locked glovebox or similar storage area where practicable.

The vehicle transportation requirements do not apply to a firearms licence holder who is using a vehicle when actively engaged in legally authorised pest control but:

- The requirements need to be met when travelling between pest control locations.
- A permit to carry a loaded firearm in a vehicle on a public road is still required - this can include places like parks and beaches.

Organisational firearms

Licence holders will have until 31 August 2028 to register arms items in their possession. However, there are activating circumstances where they will need to provide information to the Registry within a shorter time frame. When one of these circumstances happen, we'll let them know what they need to do.

Arms items must be registered only once, by a single licence holder. Arms items stored in centralised secure storage that are used by a range of people (for example, an armoury) can all be registered by a single licence holder. Anyone with a firearms licence and relevant endorsement (if applicable), or appropriately supervised person, can access the firearms. If another licence holder has possession of the arms item (meaning they have effective control of it) for more than 30 days, those items will need to be transferred to them in the Registry. For firearms used by endorsement and permit holders, this transfer needs to happen sooner.

Tools from the future: Using AI technology to outsmart predators

Bec Simpson, Boffa Miskell
bec.simpson@boffamiskell.co.nz

Co-author: Helen Blackie, Boffa Miskell.

Bec is a biosecurity consultant at Boffa Miskell. Bec is presenting on behalf of Helen Blackie.

Predator control has been a massive focus for many of us in recent years. To maintain the gains we have made and to continue to push forward, we need to surpass the current limitations of conventional tools. Integrating the latest technological advancements into biosecurity work will help to expand our current predator control toolbox and advance our mission towards a predator-free Aotearoa.

Harnessing the power of machine learning and remote sensing technology has allowed the Critter Solutions team to develop smarter, more efficient surveillance and trapping solutions. These maximise efficacy while minimising costs and labour required to maintain control and monitoring networks. Recent work has included developing novel resetting traps which use 'edge' AI to identify target species (whilst not triggering on natives), as well as cost-effective cameras with real-time notifications and AI capabilities. This tech allows us to work smarter not harder - devices can be triggered remotely, control is target specific and safe, and technology makes decisions for us (even in remote environments).

Smart tech innovations help future-proof projects, providing more effective, self-sufficient, and longer lasting control tools.

Searching for improved bait delivery systems for control of dama and Bennett's wallabies

Graham Hickling, Manaaki Whenua Landcare Research
hicklingg@landcareresearch.co.nz

Co-authors: Tim Day, Day in the Bush, Rotorua; Bruce Warburton, Manaaki Whenua Landcare Research, Lincoln.

Graham is a Senior Researcher in the Wildlife Ecology and Management Team at Manaaki Whenua. His research focus is vertebrate pest control and wildlife behavioural ecology. Graham began his career with the NZ Forest Service, then from 1992 - 2019 taught into wildlife biology and management programmes at Lincoln University, Michigan State University, and the University of Tennessee (where he directed the Center for Wildlife Health).

Expanding populations of introduced Bennett's wallaby and dama wallaby - which damage NZ's agriculture, silviculture and native vegetation - are being targeted by a national eradication programme. Aerial 1080 baiting is effective for wallaby control but cannot be used in all areas. The eradication programme is therefore supporting research to develop improved methods for ground delivery of toxic baits for wallabies.

In a field trial of traditional bait feeder designs, we confirmed earlier reports that wallabies, unlike possums, are very hesitant to use enclosed feeders. In contrast, wallabies readily feed on weather-resistant wax 'strikers' attached to narrow stakes that do not block their vision and hearing. Strikers on stakes are also highly attractive to possums, which are remarkably behaviourally dominant over both wallaby species. Consequently, possums often consume all strikers before wallabies have an opportunity to feed. In a follow-up trial in dama wallaby habitat, we investigated deploying larger volumes of bait (cereal pellets and strikers) in more open feeder designs, with pulses of toxic bait (Pindone® and Feratox®) aimed at suppressing possum interference. Despite numerous possums being killed, additional possums continued to appear at the feeders and the kill of dama wallabies remained low. Meanwhile, in a patch of relatively possum-free Bennett's wallaby habitat, we achieved a higher kill of wallabies using traditional Feratox® strikers on stakes than we did with the new 'open' feeder designs.

Clearly, possum interference greatly reduces the efficacy of current ground-based wallaby baiting in habitats where the two species overlap. Past research has shown that wallabies are susceptible to poisoning with 1080 gel on natural broadleaf foliage baits. Since possums usually avoid feeding on broadleaf, this method could be a way to target wallabies in habitats where possum interference is high. 1080 use on farmland is problematic, however, because of risk to stock, dogs, and other non-target species. We tested whether two cyanide treatments - Feratox® pellets and Cyanara® paste - applied to broadleaf foliage could target Bennett's wallabies in an area with possums. The broadleaf baits were readily eaten by wallabies and not by possums, but leaves with toxic pellets or paste were rejected and only one wallaby was killed. We conclude that broadleaf baiting does have potential as a species-selective method for wallabies, provided a more palatable, perhaps gel-based, poisoning method can be developed.

ISLANDS

Eradicating an Invader: maintaining gains in the fight Against the broad-tailed gecko on Rangitoto Island

**Sid Wales (he/him) | Senior Advisor, Biosecurity Response
Readiness and Response Services - Tāoro Mataara
Biosecurity New Zealand - Tiakitanga Pūtaiao Aotearoa
Ministry for Primary Industries - Manatū Ahu Matua
sidney.wales@mpi.govt.nz**

Sid has worked at Biosecurity NZ for the last three years, currently as a Senior Adviser in the Biosecurity NZ Response team. He has experience across multiple Biosecurity NZ and NZ Food Safety responses in various roles including, most notably, exotic Caulerpa response controller and response manager. He has also worked as Intelligence lead for the Broad-tailed Gecko, Freshwater Gold Clam, and Salmonella enteritidis responses. He is from Wellington, and has a background in clinical psychology before entering the world of biosecurity.

Island ecosystems are especially vulnerable to invasive species. This presentation details the ongoing fight to eradicate the broad-tailed gecko (BTG) from Rangitoto Island, following its discovery in 2020. Aligning with the conference theme 'Maintaining the Gains' we will showcase the successful partnership between Biosecurity NZ, DOC, and Iwi, and the progress we have made towards eradicating this invader population.

BTG mature and breed quickly and can survive in a broad range of environments. This, in combination with the parasitic mites that they carry, make BTG a real threat to several species of indigenous reptiles.

Through a combination of surveillance and capture techniques, we have achieved a decline in BTG detections that indicates a possible knockdown of the population. Our response demonstrates the effectiveness of refined eradication techniques and highlights the importance of tailoring these methods based on ever-changing field data.

This presentation will detail our approach, including:

- Working closely with local iwi to understand the landscape and follow appropriate tikanga.
- The potential impacts of BTG on indigenous species and the response background.
- The targeted use of search and capture techniques to locate and remove BTG.
- The analysis of environmental data to optimize capture efforts.
- Lessons learned that inform future eradication efforts for other islands of Aotearoa.

We look forward to sharing how we are maintaining the gains made in protecting Rangitoto's and other Aotearoa islands' unique biodiversity from this invasive threat.

Ulva Island 2023 Eradication: the challenge of maintaining its pest-free status

Katie Ward-Allen, Department of Conservation
kwardallen@doc.govt.nz

Co-authors: Jennifer Waite, Jenny Long, Stephen Horn, and Finlay Cox, Department of Conservation

Katie is an Eradication Assistant in the National Eradication Team at the Department of Conservation. The National Eradication team forms part of DOC's Predator Free 2050 team and is focused on island eradications both through technical advice and operational delivery. For the past five years Katie has held roles throughout DOC with a particular interest in animal pests. As part of the Ulva Island 2023 eradication Katie managed the outcome monitoring and was part of the aerial baiting team.

Ulva Island (Paterson Inlet, Rakiura/Stewart Island, New Zealand) is a pest-free open island sanctuary and is part of the Rakiura National Park. This island serves as habitat for several endangered species notably the tieke/South Island saddleback and mohua/yellowhead. The accessibility of seeing these species and a pest-free ecosystem means that Ulva Island is an important tourism attraction for the Rakiura community. Unfortunately, its proximity to Rakiura means it is prone to almost annual incursions from rats, threatening its pest-free status. Norway rats were initially eradicated between 1992-1995. Most incursions are successfully removed, however eradication was again necessary in 2011 following a population re-establishment in 2010. Rats reinvaded in 2021, and the incursion response was abandoned in May 2022 as a population had once again established. DOC's National Eradication Team undertook a feasibility assessment for the eradication of rats from Ulva Island for a third time, assessing the benefit against the initial and ongoing costs. Following this assessment, the decision was made to eradicate rats from Ulva Island for a third time, on the dependency of an upgraded biosecurity network. The eradication was undertaken in winter 2023 following aerial best practice, and was deemed successful in January 2024. Decades of island eradications provides confidence in our ability to remove rodents from islands; Ulva Island reinforces the challenges in maintaining the pest free islands and emphasises the need for ongoing commitment.

Kia mau te tītī mō ake tonu atu - Keep the tītī forever

Sandy King, paws4conservation
paws4conservation@gmail.com

Co-author: Lania Davis - Rakiura Tītī Islands Administering Body.

Sandy has been a Conservation Dog Handler for over 25 years and resides on Rakiura. She currently has two rodent detection dogs, and since 2018 has been working with the Rakiura Tītī Islands Administering Body and Rakiura Tītī Committee to encourage the tītī whānau to implement better biosecurity practices when travelling to the Tītī Islands.

Lania is Rakiura Māori who has been involved in the annual tītī harvest for over 30 years. She is an elected member of the Rakiura Tītī Islands Administering Body. For more than 9 years Lania has been leading biosecurity work carried out by her whānau on Rukawahakura (Joss's Island).

Thirty-six Tītī Islands surround Rakiura, 70% of which are rodent free. Some have never had rodents while on others rats have been eradicated by whānau with support from the Rakiura Tītī Islands Administering Body, the Rakiura Tītī Committee, Department of Conservation, and private

contractors. Translocations of taonga species including tīeke/South Island saddleback, toutouwai/Stewart Island robin, mātātā/fernbird, and tutukiwi/Snares Island snipe have taken place to, and between, some islands.

During the annual tītī harvest, the birding whānau travel to the islands between March and May, taking with them large volumes of supplies including provisions for multi-week stays, harvest supplies, and building materials. In 2018 the Rakiura Tītī Islands Administering Body began the Tītī Islands Biosecurity project in recognition of the risk posed by visitation during the harvest season. Rodent detection dogs carry out pre-departure inspections of gear and vessels travelling to the islands, and sometimes assist whānau with on-island surveillance. The project also advises on trap and bait station installation, and helps raise awareness of the biosecurity risks associated with harvest activity and practices such as using clean, sealed containers that can reduce these risks, thus protecting tītī and all of the islands' taonga species forever.

Keeping pests off Hauraki Gulf Islands (winning friends without making enemies) one commercial transport operator at a time!

Karen Thode, Auckland Council
karen.thode@aucklandcouncil.govt.nz

Karen joined Auckland Council in 2023 after 13 years at Key Industries as a Key Account Manager, developing expertise in pest control methods, and tools and technologies, as well as obtaining a Certificate in Pest Operations Urban Pest Control. As a Biosecurity Advisor, Karen is dedicated to understanding the needs of Hauraki Gulf Island stakeholders and their businesses, and working alongside them to provide support and advice to keep the islands pest free.

Auckland Council's Pest Free Warrant scheme uses Regional Pest Management Plan rules to regulate an important industry pathway, requiring proactive biosecurity measures that reduce the risk of pest spread. Since it began in 2009, Auckland's Pest Free Warrant Scheme has focussed on raising the profile of biosecurity amongst commercial vessel operators working across the Hauraki Gulf, to help protect its special islands and their taonga species. Initially a voluntary scheme, on 1 January 2024, after being phased in over several years, it became mandatory under Auckland's Regional Pest Management Plan for all Commercial Transport Operators to hold a warrant. To date, 130 sea, land and air operators are accredited, and zero compliance action has been necessary. Face to face conversations have been key to this, along with understanding an operator's business and tailoring the warrant's requirements to reflect this. Ongoing support and checks that pest control is robust at key departure points is helping to build trust, protect the islands, and reduce the risk of rodent stowaways. This has set a great foundation for basic biosecurity measures as 'business as usual' amongst operators, for the benefit of the Hauraki Gulf islands in the long-term. The Pest Free warrant scheme is gaining international recognition, with RSPB Scotland introducing a Predator Free Certificate scheme for boats operating in Scottish waters inspired by the Auckland-model.

WEEDS

Velvetleaf: taming the giant or falling asleep at the wheel?

Sally Linton, Sustainable Options
Sally.linton.nz@gmail.com

Co-author: Heidi Pene, Plant Pest Officer, Waikato Regional Council

Sally (B.Hort. Sc., LLB(Hons), Dip.Bus.Admin) has been contracted as the North Island Velvetleaf Coordinator for the last five years. From a dairy farming background, she has worked in agricultural policy since 1998 for organisations including Federated Farmers, Dexcel/DairyNZ, Animal Health Board, Waikato Regional Council, and government organisations. Currently, along with the velvetleaf work, Sally is contracted as the Northern North Island facilitator for the Foundation for Arable Research Growers Leading Change programme.

Velvetleaf, a major biosecurity threat since the 2015/16 fodder beet incursion, has seemingly receded from public consciousness. While new property detections in the North Island have dwindled, the perceived 'under-control' poses a hidden danger - complacency. Farmers and growers, lacking fresh information on the threat, may neglect biosecurity practices, setting the stage for resurgence. Even landowners, managing existing incursions well, face the risk of a single lapse triggering widespread dispersal. Our present successes, achieved through active collaboration with affected landowners, contractors, and the wider farming community, hinges on constant vigilance. This presentation argues that 'he tangata, he tangata, he tangata' – 'it is the people, it is the people, it is the people' - remains the cornerstone of maintaining the gains against velvetleaf. Continued education, collaboration, and awareness, are crucial to prevent this 'sleeping giant' from awakening with devastating consequences to the farming sector.

Mid Dome - Maintaining the wilding tree control gains and beyond

Richard Bowman, Mid Dome Wilding Trees Charitable Trust
richard@wildingpinenetwork.org.nz

The Mid Dome Wilding Tree Control Programme is a highly successful community-led, biosecurity/biodiversity partnership that spans over 18 years. Mid Dome is a mountain range in northern Southland where from 1950s-1980s, government agencies planted over 750 ha of *Pinus contorta* (with minor *P. mugo*). This was an attempt to control soil erosion and to protect road and rail links at the foot of the range.

By the 1990s it was apparent that mature *P. contorta* on the higher slopes was spreading rapidly downwind to the south and east. This was affecting an area of over 70,000ha of vulnerable high country grassland. The Department of Conservation began control on land it managed in the mid-1990s. However, it was not 2006 that widespread community concerns led to the formation of the Mid Dome Wilding Trees Charitable Trust. The Trust represents a partnership of affected land holders and stakeholders as well as Government agencies (MPI, DOC, LINZ) and Environment Southland.

Since then, the Trust has worked with its partners to plan and implement a major wilding control programme aimed at removing all mature trees, and eventually returning any residual wilding

management responsibility to the respective land holders and managers. To date, over \$20M has been invested, which has resulted in containing any further spread of infestation. It has also treated the trees within the 20,000ha core programme area at least once.

A review of the Mid Dome wilding tree strategy in 2023 suggests that the programme could be completed by 2033 if the appropriate levels of funding can be maintained. Unfortunately, recent reductions in national Wilding Conifer Control Programme funding pose a major challenge at Mid Dome. This currently makes it difficult to just maintain the gains made to date, let alone to complete the programme.

Much of the success at Mid Dome so far comes from the commitment of the Trust and the local community and land holders it represents to achieving their long-term goal of a 'wilding free Mid Dome'. Without the effort it has made over the last two decades much of the affected area would now be under a continuous exotic 'weed forest' cover with all the economic and environmental problems that brings. It now just needs to be able to finish the job.

Chilean flame creeper biocontrol leaps forward

Ronny Groenteman, Manaaki Whenua - Landcare Research
groentemanr@landcareresearch.co.nz

Co-authors: Quentin Paynter, Simon Fowler, Robyn White, Manaaki Whenua - Landcare Research; Hernan Norambuena, Independent researcher, Chile.

Ronny is a senior researcher in weed biocontrol at Manaaki Whenua - Landcare Research, where she has been working with the weed biocontrol group since 2008.

Chilean flame creeper is an attractive climber with beautiful red flowers, a garden plant that has become a weed. It smothers trees and takes over bush remnants, mainly in Southland, Otago and Canterbury, but also in Manawatu. A serendipitous discovery in late 2019 of a leaf beetle in the native range of Chile escalated this weed up the priority list for biocontrol. Through the times of COVID border closures and movement restrictions, we have still managed to progress through the steps of a biocontrol programme with the help of our collaborator in Chile. In late 2022, we imported the beetles into containment in NZ, and have completed the host range testing for the beetle. Not all went as smoothly as we hoped. With Chilean flame creeper sharing ancestry with the cabbage family, there was a degree of anxiety over whether the beetles could develop on any native species or economic crops in this hugely significant plant family. Come to this talk to find out what happened at our testing and where to from here.

Untangling the vexatious vine - waging war on wild kiwifruit

Andrew McConnell, Kiwifruit Vine Health
andrew.mcconnell@kvh.org.nz

Andrew joined KVH in March 2022 as National Operations & Compliance Officer, and brings with him a wealth of experience in biosecurity, pest management, and risk management. He has worked in roles across the private sector, central, and local government, most recently as Senior Biosecurity Officer at Waikato Regional Council, where he ran large-scale pest animal control and eradication projects. Prior to that, while at the Ministry for Primary Industries (MPI), Andrew was a Quarantine

Officer in Auckland. He worked across the cargo, airfreight, mail, and passenger pathways inspecting goods entering New Zealand for biosecurity risk. He has also held the role of Movement Control Manager for Queensland Fruit Fly (QFF) incursions, managing the movement of risk goods into and out of Controlled Areas. Andrew is no stranger to the kiwifruit industry - he once worked at Aongatete Coolstores in production and technical roles, specifically running their KiwiGreen and Psa programmes. Having recently returned home to Mount Maunganui, Andrew's role at KVH primarily focuses on collaborating with regional councils and landowners on the national wild kiwifruit control programme, managing the movement of risk material throughout the country, and managing compliance in relation to the National Pest Management Plan and new Pathway Management Plan.

Ironically, Te Puke - the kiwifruit capital of the world - is also ground zero for its unfortunate cousin, wild kiwifruit. Kiwifruit Vine Health (KVH) works with regional councils and landowners to manage wild kiwifruit populations throughout Aotearoa to reduce the biosecurity risk posed to our kiwifruit industry and environment.

Find out what's being done across the motu. We share findings from a recent review of the programme undertaken by Jon Sullivan from Lincoln University, we look to a positive future by undertaking research into understanding seed dispersal from orchards and how this can be mitigated, and we share how we plan to continue gains made over the past 20 years with our recently implemented five year plan.

Finally, diving into a virtual tour of a large infestation in the heart of kiwifruit country - a vertical site off No 2 Road falls away to the Ohineangaanga Stream below, accessible only via abseil - we share the mahi being undertaken by Full Circle, who specialize in controlling vines in the trickiest of places daily.

PATHWAYS

Investigating the role of wildlife in emerging infectious diseases: highlighting the need for local collaboration

Chris Niebuhr, Manaaki Whenua Landcare Research
NiebuhrC@landcareresearch.co.nz

Chris is a wildlife disease ecologist who has established a platform for ecological research into diseases of wild animals and infectious agents that pose a threat to humans, companion and agricultural animals, and native species. He is interested in a variety of diseases and parasites that are both currently found in NZ, and those at risk of being introduced.

New Zealand is home to a variety of infectious diseases that can affect wildlife, companion and agricultural animals, and people. At Manaaki Whenua Landcare Research, we are currently researching a number of diseases that incorporate a wildlife component, whether it is native species negatively affected, or introduced species contributing to spread. Here we discuss a few of the ongoing research projects, many of which are collaborations with various councils, universities, and other NZ agencies. We will report on new avian malaria infection reports in seabirds, preliminary results of Leptospira infection in rodent populations, modelling toxoplasmosis and predator-prey dynamics in feral cat and rodent populations, sampling hedgehogs for Salmonella, and investigations into tick infestations at penguin nesting sites. Finally, we will discuss the need for local collaboration and assistance with wildlife sampling and disease research throughout NZ.

Biosecurity and pest control in the New Zealand Defence Force

Art Polkanov, New Zealand Defence Force

Art.Polkanov@nzdf.mil.nz

Co-authors: Alison Beath, Michal Kocis, Stephen Phillipson, Land Management Unit, Environmental Services, New Zealand Defence Force

Art is a professional wildlife biologist with vast research and managerial experience and international exposure. He has published a number of papers on animal ecology and various aspects of biosecurity and biodiversity conservation, and is a member of NZBI, Birds NZ, and the Australasian Bat Society.

Occupying more than 81,000 ha across the country, the New Zealand Defence Force (NZDF) is one of the largest land users in Aotearoa. Defence-managed Crown Estate includes a wide range of assets, including environmental ones.

NZDF's management vision for the estate it manages is 'fit for purpose and sustainable Estate that enables the delivery of Defence outputs to respond to the needs of the New Zealand Government and contingencies, and support other government agencies'.

As stewards/kaitiaki of the natural assets of the NZDF-managed Estate, the Land Management Unit is accountable for making evidence-based decisions that protect, maintain, and enhance these assets, while enabling NZDF to meet its statutory obligations and perform at its best.

Our Land Management Programme continues to see success through delivery of sub programmes at multiple sites. The delivery of the Pest Management Programme has resulted in reductions of many populations of pest plants and animals, for example, wilding conifers and lagomorphs, many of which now occur below statutory thresholds. Our Biodiversity Programme includes ecological outcome monitoring at most of the major sites, and is primarily designed to measure ecosystem response to our management, and so to help guide that management.

A principal of our programme is to protect elements of biodiversity that we are not yet aware of. To achieve this, our overarching goal is to maintain general ecological function, so that the undiscovered ecological elements have a high chance of survival to the point we become aware of them, and of any special management requirements we may need to consider/implement. Recent discoveries of such things as spotless crane, various endangered *Pimelea* species, endangered galaxiids, and other rare/endangered native fauna and flora on Defence-administered land, supports this course of action. High priority is afforded to resourcing projects that target exotic species that will precipitate widespread and significant negative change to the underlying, native species dominated, ecosystems. Examples of these are our wilding conifer control at Whangaparaoa Tekapo and Waiouru, lagomorph control in Takapō/Tekapo and Waiouru, and deer and goat control at Ardmore. Crucial to supporting this outcome is to continuing to survey areas we manage (complete flora and fauna inventory) to maximise our chances of discovery; monitoring the response of ecosystems to our management actions to ensure we are achieving our goals; and remaining alert to change, such as new biosecurity threats or ecological shifts in response to climate change or/and anthropogenic factors.

Big Heads Online and the Mail Order Pest Infestation

Murray Fea, DOC
mfea@doc.govt.nz

Murray is a technical advisor in biosecurity for the Department of Conservation. He has a background in entomology and currently works on invasive ant programmes, biosecurity research advice, and support to plant pathogens team.

Pheidole megacephala, the African big-headed ant or coastal brown ant, is considered one of the most problematic tramp ant species capable of environmental 'devastation' due to displacement of most native invertebrates. It also impacts vertebrates, plants, honeydew regime, seed dispersal, and human infrastructure and machinery.

In New Zealand, this ant species is only established in Auckland, but as a tropical species it is also likely to be capable of infesting Northland, and potentially also areas further south under a warming climate.

Unfortunately this species is being offered for sale (among several other exotic ant species) as pets or ant farms, on Trademe, so is likely to be getting mailed anywhere in the country. DOC and MPI haven't been able to prevent this due to our compliance functions relating to native species and unwanted organisms only, respectively. A letter from MPI's national compliance team was able to get the seller to add a note to the auction saying that they cannot ship them to Northland, where it is a RPMP pest. This highlights the value of regional pest statuses for national biosecurity coverage. However there is a gap between the national and regional pest regulation that this type of activity has fallen into.

Temperature is the strongest limitation on this ant's activity. Based on climatic modelling published earlier this year, it has the potential to expand to higher latitudes (Ke et al 2024). Indoor records from relatively high latitudes in Europe indicate that establishment in microclimates outside of the climatically suitable range are likely. I suggest an increasing level of vigilance outside of Auckland and Northland is warranted, and exclusion pest status in RPMPs would be helpful. There is an avenue to reduce the breeding and selling of the pest in Auckland, as long as it is listed elsewhere, as the breeders would then have limited ability to sell them outside the region. Ongoing improvement to the biosecurity legislation should seek to address the gap highlighted by this example, and the Biosecurity Act review is one opportunity to do this.

Regulating the sale and breeding of pest pets in the Auckland Regional Pest Management Plan

Andrew Hart, Auckland Council
andrew.hart@aucklandcouncil.govt.nz

Co-authors: Dr Imogen Bassett and Andrew Hart, Auckland Council

As the Regional Conservation Advisor at Auckland Council, Andrew manages a number of exotic parrot control projects (SC cockatoo, Indian ringneck parakeets, rainbow lorikeets)

Internationally, and in Aotearoa, the pet trade is a key contributor to contemporary novel vertebrate invasions (e.g. red-eared sliders, Indian ringneck parakeet and Alpine newt). This is as a result of

both accidental and deliberate releases. Once established in the wild, exotic parrots, reptiles and amphibians are typically very difficult to manage, due to a lack of effective tools for detection and control. In addition, because these animals are highly charismatic, often colourful and charming, there can be strong social opposition to control efforts. Because of this, regulation of breeding and trade are important elements of preventative management strategies. Auckland Council's Regional Pest Management Plan contains restrictions on the sale and breeding of three parrot species and six pet reptile species. In this talk we will discuss how this has been implemented, and lessons learned.

TOOLS/MODELLING

Modelling the generation, viability and potential movement of lagarosiphon fragments in Lake Wanaka

Ben Woodward, NIWA
ben.woodward@niwa.co.nz

Co-authors: Aiden Jabbari, Inigo Zabarte-Maeztu, Deborah Hofstra - NIWA

Ben is a biogeochemist with expertise in nutrient cycling in shallow lakes, and a particular focus on lake rehabilitation using natural processes such as the re-introduction of native submerged macrophytes, and/or native kakahi (freshwater mussel) rafts. He has also worked with various phosphorus binding agents to aid lake rehabilitation and how they are affected by humic acids. Ben's recent work has focussed on lake rehabilitation, nutrient attenuation in wetlands and riparian zones, stream metabolism, sediment tracking, and submerged macrophyte rhizosphere metabolism. Ben is the group manager of the NIWA's Aquatic Pollution group, and will be the PI of this project.

The control of alien invasive plants (AIPs), to maintain aquatic biodiversity, protect ecosystem health and ensure usable waterways, costs New Zealand millions of dollars every year. AIPs outcompete native aquatic plants, dominating the locations where they become established. Establishment of submerged AIPs in new locations occurs primarily through the expansion of existing beds, and transportation of plants or plant fragments to new locations via humans or by currents within waterbodies. Here we focus on expansion within waterbodies via fragments of the submerged AIP, *Lagarosiphon major*.

Of initial interest is the viability of fragments that are generated after a weedbed is treated with herbicide. We quantified fragment production, and the duration of fragment viability from 250 lagarosiphon plants grown in 1200 L tanks and treated with the herbicide diquat. Diquat concentrations used were 0 (control), 0.05, 0.1 and 0.5 mg L⁻¹ for a contact time of approximately four hours, with each treatment replicated three times.

This data will be feed into a particle tracking model using Aquatic Ecosystem Model 3D constructed for Lake Wanaka. The model simulations of temperature and current were validated using the field data during 2022-2024. This model is able to release a particle from known locations of lagarosiphon beds treated with diquat, and predict where any fragments generated will be located after 30 days.

The results show that particles are advected following the current in the lake. The particles released in the Dublin Bay, Roys Bay, and Parkins Bay, accumulated along the southern boundaries of the bays, which was consistent with the dominant wind direction (North to South), while those in the

Paddock Bay circulate around the bay. With further model development, we aim to better predict where fragments will be transported to, and over what timeframes, for support, surveillance, and operational weed management in the lake.

Developing a Smart Weed Alert Tool to detect new weed incursions early

Kate McAlpine, Department of Conservation
kmc Alpine@doc.govt.nz

Co-author: Nigel Charman, Independent Consultant

Kate is a weed ecologist and science advisor at the Department of Conservation.

There are 387 species on the recently updated list of environmental weeds in New Zealand, and another ~1800 exotic plant species have started to naturalise. There are an additional ~30,000 exotic plant species already present in New Zealand (mostly in gardens), and some - perhaps many - of these will become invasive in the future. Despite this huge pool of potential weeds, early detection of new weed incursions currently relies on luck and/or time-consuming, manual research across multiple platforms. This means that most newly naturalising environmental weeds are not detected until they have become widespread, and thus difficult (and expensive) to control.

New Zealand currently spends around \$50 million on controlling weeds and managing their impacts. This is only going to increase as new weeds emerge and current weeds spread - and both are likely to accelerate under a warming climate. Plans are underway to address this problem by developing a Smart Weed Alert Tool (SWAT). SWAT will automatically analyse new exotic plant observations posted to iNaturalist or the Global Biodiversity Information Platform (GBIF), combining information about the species and the invasion site to determine if the observation is significant in any way. Significant observations, such as the first record of a highly invasive weed in a certain region or vulnerable ecosystem, will trigger an alert. SWAT will be freely available, and users will be able to set up their own alerts based on their parameters of interest.

SWAT will be most effective if all organisations managing weeds regularly post their weed data to GBIF. We also strongly encourage the use of the nature recording app iNaturalist to post exotic plant observations; this will further enhance the effectiveness of SWAT and improve our understanding of changing weed distributions. SWAT will be a game changer for national weed surveillance and will significantly improve our chances of detecting new weed incursions early.

Progressing or regressing? Modelling the required inputs for a weed control programme

Brent Rohloff, Boffa Miskell
brent.rohloff@boffamiskell.co.nz

Brent is a Biosecurity Consultant with Boffa Miskell Ltd. Among his many projects, he is the Programme Manager for the Mid Dome Wilding Conifer Programme. Brent has had a 25 year career in biosecurity, with a focus on improving environmental and production outcomes across Otago and Southland. Originally from a vertebrate pest and disease management background, Brent's recent work has involved terrestrial weed management and wilding conifer control.

The requirement to forecast the ongoing costs of biosecurity programmes has long been a requirement of project managers. Given the wide range of factors involved (e.g., pest biology, abundance and distribution, land use, control methods, the contracting market, inflation and available funding) it can sometimes feel like a crystal ball is required to do the job.

To simplify long term budget forecasting, Boffa Miskell has developed a model that details the required future financial requirements to achieve eradication of wilding pines in the Mid Dome Management Unit. This presentation will provide an explanation of what the model is, how it works, and how it is being applied at Mid Dome. Importantly for all biosecurity practitioners, this model could be adapted to many other scenarios and pest species.

PROJECT MANAGEMENT

Preserving progress: prioritising weed management with limited resources

Beth Williamson, Boffa Miskell
bethw@boffamiskell.co.nz

Beth is deeply committed to ecological restoration, demonstrating a strong focus on the distribution and management of invasive weed species. Since becoming part of the Boffa Miskell team in 2020, Beth has worked on a wide array of invasive species control programmes, including the LINZ Biosecurity programme and the Molesworth Wilding Conifer Control Programme. She has also contributed to the development of strategic plans, operational plans and reports in the aquatics and terrestrial weed space for multiple clients, including Marlborough District Council, Environment Southland, and the Department of Conservation.

With an estimated 20 new exotic plant naturalisations occurring annually in Aotearoa, and resources for weed control trending downward nationally, how can we sustain the progress made in protecting biodiversity and landscape values from the undesirable impacts of invasive plant species?

Whole-of-catchment strategies offer a path forward, enabling us to effectively and efficiently prioritise species for control when constrained by limited resources. These strategies, exemplified in the Waiau Toa Clarence River weed control programme (co-managed by Environment Canterbury and Toitū te Whenua Land Information New Zealand), provide a roadmap for catchment-scale weed management, outlining species present, priorities for control, the benefits of removing the constraints of land tenure, and integrating geospatial data to make informed decisions.

This presentation explores the success of the collaborative programme in Waiau Toa Clarence, showcasing how strategic thinking and stakeholder cooperation is essential in delivering enduring outcomes. This presentation discusses how this approach can serve as a model for other catchments, emphasising the importance of accurate data capture, stakeholder collaboration and engagement, and proactive planning in protecting Aotearoa's unique environment from the impacts of invasive species. Sustaining the programme's success amid uncertain future resources remains a challenge, but with the guidance of an updated strategy in 2024, we can continue to protect the unique biodiversity and landscape values of the Waiau Toa Clarence River.

Assessing the efficacy of Bennett's wallaby as a Judas animal

Gavin Udy, Otago Regional Council
gavin.udy@orc.govt.nz

Gavin is the Otago Wallaby Eradication Project Manager for the Otago Regional Council. Gavin joined the Council two years ago, after seven years working in animal and plant pest control as a contractor, and 20 years prior to this in the Department of Conservation, working with threatened species recovery and being involved in pest management.

Detecting and controlling Bennett's wallaby in areas of very low density is one of the major challenges within the Tipu Mātoro National Wallaby Eradication Programme. This is particularly relevant to Otago and parts of South Canterbury, which have a very low density of wallaby and are the closest to achieving eradication. The tools involved with reducing wallabies from high- to low-density are reasonably well-developed, but the research to date into detecting and controlling wallabies at very low-density has been minimal. Applying the 'Judas' technique to wallabies, where a satellite tracked wallaby is used to find other wallabies in the area, has the potential to significantly increase detection rates and kill rates compared to non-Judas approaches, and accelerate the eradication of Bennett's wallaby. This presentation will cover the research project currently underway to assess the efficacy of Bennett's wallaby as a Judas animal in low-density environments.

Data collection in biosecurity response: connecting all the pieces

NavKaran Parmar, Specialist Advisor Geospatial (Response), Biosecurity New Zealand
navkaran.parmar@mpi.govt.nz

NavKaran (BSc (Honours) in Geography) has been working for MPI for the past year, and has had experience in multiple responses, including exotic caulerpa and Corbicula fluminea, as a Geospatial Specialist providing technical expertise. Prior to MPI, NavKaran worked as a geospatial expert in local council with interactions with regional councils. He is originally from Auckland, with a deep passion for all things geospatial.

When a biosecurity response occurs, some of the first questions asked are related to location. Areas of interest are established, delimitation surveys are conducted, and long-term sampling and data gathering begins. However, the current status quo does not have a defined structure on how data should be collected. With each response having a mountain of data, paper-based field data collection introduces a greater potential for error. Field collection notes can be lost, samples arrive at sampling labs and can lose connection to location, lag is introduced to the response as well as technical experts, and there is no one 'source of truth'.

In the *Corbicula fluminea* response, the use of the ESRI ArcGIS Stack has been introduced to help combat these issues. ArcGIS Survey123 Mobile is being used for data collection in the field. The data is being stored in a cloud based, geo-located database, and Animal Health Lab (AHL) is connecting to this data via its Laboratory Information Management System (LIMS). With data now in a 'one source of truth' database that is being populated by external organisations' field staff, connected to LIMS and being disseminated to response and technical staff, confident decision making has become possible.

Eleven different organisations, with over 20 individual field staff across the country, have collected 100+ samples to date. AHL is not having to interact with any paper-based forms, as the LIMS system

automatically is being populated by field staff, only having to interact with the database to enter results. The use of Survey123 to create a central response sampling repository has proved to be greatly beneficial to biosecurity response, and sets a new standard for data collection. As more biosecurity responses occur, the long-term benefits of using the Survey123 framework will help maintain the gains.

FRIDAY 26 JULY 2024

LANDSCAPE MAINLAND

Aerial predator control - defending for 20 years

Shanti Morgan, West Coast Regional Council
shanti.morgan@wrc.govt.nz

Shanti is the General Manager Operations for the West Coast Regional Council, managing both the Vector Control Service business unit and the West Coast Regional Council Quarries. Shanti has over ten years' experience in the biosecurity industry and is passionate about long term strategic thinking and entire ecosystem outcomes as opposed to single species eradication.

The West Coast Regional Council has delivered aerial and ground predator control on behalf of DOC and OSPRI for over 20 years. Over this period the business unit has planned, delivered and reported on over 2 million hectares of predator control resulting in significant biodiversity gains on behalf of these organizations. We explore the progression of predator control to where we are today through a presentation that encourages questions on how we maintain what has been done in the most heavily treated area in New Zealand. We also address the risk of loss in gains that have been achieved through the significant investment of OSPRI, who are looking to move into a monitor/survey approach to manage TB in the region. We also question how we are prioritizing predator control across our nation with our ultimate goal of predator free by 2050, and how this impacts the West Coast.

Community-led landscape-scale pest management being delivered through the Northland Regional Council's 'High Value Area' Programme

Dai Morgan, Northland Regional Council
daim@nrc.govt.nz

Dai is the Biosecurity Partnerships Manager, Northland Regional Council. He also likes birds.

Through the 2018-2028 Long-Term Plan consultation process, Northland communities supported a proposal to significantly increase funding for pest control activities across Northland. To achieve better landscape-scale outcomes, the 'High Value Areas' (HVAs) programme - which are large geographic areas across Northland where high biodiversity and recreational values are matched with

strong community interest in pest control - was initiated. Currently, there are six HVAs across Northland which have a combined size of 153,500 ha (range: 9,900 - 71,000 ha). Projects have leveraged off secured funding from the NRC and in-kind support to attract additional revenue which has increased the amount of work being delivered. The NRC supports a community-led approach to the governance of HVA projects, and as such the kaupapa of each are very different. There are, however, some key similarities between the projects which include: a recognition that in-kind volunteer input needs to be supported by professional trappers to get the greatest outcomes; a willingness to use secondary VTAs, such as 1080, to manage untrappable pests; enthusiasm to broaden the scope of management to include other pests, such as weeds; and a realisation that outcome monitoring is needed to demonstrate how effective management has been.

Accordingly, this paper aims to: (1) present the key mechanisms that has allowed the NRC to support community to lead the recovery of biodiversity in their areas, and (2) highlight some of the challenges and successes the projects have had.

From Locals to Landscapes - Our Predator Free Challenge

Jonathan Clark, FTP Solutions
jonathan.clark@ftpsolutions.co.nz

Jonathan is an environmentalist and technologist who is committed to developing solutions to meeting our environmental management challenges at a landscape scale. Jonathan works for a company called FTP Solutions who have been instrumental in building real-time multi-dimensional decision support tools for challenges than span wide geographically dispersed areas. Jonathan and FTP have adapted existing technology and built new technology specifically to scale our abilities to achieve Predator Free status across large landscape areas.

From Locals to Landscapes: Our Predator Free Challenge - how we scale from relying on locals suppressing pests in local areas to achieving and sustaining elimination across large landscape scale areas.

1. Locals:

- a. Small country, labour is expensive, so we need to use it wisely;
- b. Currently most PF efforts are reliant/dependant on volunteer labour;
- c. Lots of people/volunteers in and around major population centres but this is less than 10% of our PF landscape;
- d. Scale of our landscape, terrain, accessibility, scale and complexity of our challenge;
- e. People, vehicles and fuel are expensive. Let your fingers do the walking.

2. Landscapes:

- a. How can we meet the scale necessary to eradicate predators;
- b. We might win territory but how do we hold it;
- c. Not about replacing volunteers or people, it's about enabling people to do 100 x more with their available time;
- d. Banks Peninsula Scoping Analysis: using current methods in 2017 \$ cost to achieve Predator Free is approx. \$38.6B dollars, with inflation by 2050 this will be closer to X \$. Methods/Cost Table;
- e. Cost.

3. How can we leverage technology to scale to meet the challenge:

- a. What do we care about, what do we need to know?

- b. Technology means required;
- c. Inverting the CAPEX/OPEX equation, 20/80 cf 80/20.

4. What technology has FTP developed, how is it meeting this challenge:

- a. Yarn mesh communications;
- b. TrapBox;
- c. Integration with Automated Trap;
- d. Camera inside trap;
- e. AI/ML classification and decision making;
- f. AI TrailCamera;
- g. Integration of AI drones, precision targeting of pests;
- h. Real-time incursion response.

The challenges of maintaining momentum - case studies from Crown Land

Shaun Thomason, Land Information New Zealand
sthomason@linz.govt.nz

Co-author: Julie Percival

Shaun is a Senior Biosecurity Advisor in the Toitū te Whenua Land Information New Zealand (LINZ) Crown Property advisory team. Shaun has been with LINZ for five years in the Crown Property Team working either in Biosecurity and Biodiversity or Crown Land Management related roles.

LINZ is responsible for managing around 1.7 million hectares of Crown-owned land including South Island High Country Pastoral Leases, land held for Treaty settlements, Crown Forest licenses, and residential and commercial properties. One of LINZ's land management responsibilities is compliance with the Biosecurity Act. This programme focuses on Crown land where there are no lease or license agreements - predominantly lake and riverbeds.

This presentation will look at case studies from our largest aquatic and terrestrial projects at Lake Wanaka and the Rakaia River and the progress that has been made in them over the previous four years, and will also highlight the complexities of managing weeds and pests on Crown Land.

FRESHWATER

Aquatic surveillance and the value of early detection

Avantika Masand, Aquatic Incursion Investigator, MPI Biosecurity NZ

Co-author: Yanika Reed, Senior Advisor Engagement, MPI Biosecurity NZ

Do fish like discos? Testing the Bio-Acoustic Fish Fence (BAFF) as a control tool for koi/amur carp.

Cindy Baker, National Institute of Water and Atmospheric Research
Cindy.Baker@niwa.co.nz

Co-authors: Gordon Tieman, Peter Williams, Shad Mahlum, Deborah Hofstra - all National Institute of Water and Atmospheric Research, Hamilton, New Zealand

Cindy is a Principal Scientist of Freshwater Fish at NIWA, Hamilton. Her research focuses on developing control tools for invasive fish species with a wider goal of developing management strategies for population enhancement and recruitment of native diadromous species. She specialises in pheromone and semio-chemical use for population monitoring and control of invasive fish species and has a particular interest in lamprey and whitebait ecology, fish passage and biotelemetry monitoring of fish populations.

Invasive fish species are a major ecological stressor to shallow lakes in New Zealand. In particular, koi/amur carp (*Cyprinus rubrofuscus*) present a key issue for lake restoration in the North Island. Koi/amur carp are a benthivorous species that can exacerbate eutrophication in lakes through both excretion of wastes and nutrient recycling from bioturbation of sediments. The direct and indirect effects of koi/amur carp can potentially initiate a regime shift in lake systems from clear water with high macrophyte abundance, to eutrophic turbid water devoid of aquatic macrophytes.

In New Zealand, management of pest fish is stalled by the fact there are no proven and effective control tools available. Options are currently limited to either physical removal or piscicides. Where undertaken, ongoing physical removals of invasive species are laborious, costly, and have not achieved the required goals of improvements to water quality or reduced stress on predation (e.g. plants, fish, and invertebrates). Internationally, integrated management approaches have been shown to be the most successful method for suppression or eradication of pest fish species. However, before integrated approaches can be undertaken, development of effective control measures are needed for target species.

Recent laboratory and field tests in the US have shown that the Bio-Acoustic-Fish-Fence (BAFF), which couples a proprietary 20-2000 Hz complex cyclic sound with an air curtain has blocked the movement of four invasive carp species (including common carp, *C. carpio*) between 92% and 97% of the time without habituation. In New Zealand, the BAFF could be used to prevent koi/amur carp moving into desirable spawning habitat, containing winter aggregations or for restricting movement into areas where koi/amur are not currently present or are only present in limited numbers. This presentation provides an overview of outdoor flume trials, which examined the effectiveness of the BAFF and strobe lights in preventing movements of koi carp, perch and brown bullhead catfish. To examine the effect of the BAFF and lights on desirable native fish species, shortfin eels have also been tested.

Development of an automated detection tool for incursions of invasive submerged weeds

Daniel Clements, National Institute of Water & Atmospheric Research (NIWA)
daniel.clements@niwa.co.nz

Co-author: Jeremy Bulleid

Daniel is an aquatic plant scientist for NIWA's Freshwater Biosecurity group. His current research focus is the ecology of invasive aquatic plants, their impacts on aquatic ecosystems, and their management. He leads research projects developing improved detection and control techniques for invasive aquatic weeds in New Zealand and evaluating the effectiveness of control activities and eradication programmes.

Early detection of an invasive species enables early intervention, and along with prevention, early detection provides the best (most cost-effective) opportunity to successfully manage invasive species that pose a biosecurity risk. Typically, aquatic weed invasions that go unnoticed or are overlooked, or where management interventions are delayed, become problematic, resulting in a decline in the values and functions of aquatic ecosystems. When aquatic weeds establish and are left to proliferate, they compete with, and displace native species. This can cause significant habitat alteration, impact adversely on recreation and cultural values, hydroelectric generation, and compromise agricultural productivity by impeding water delivery. Surveillance methods that can be efficiently deployed are required to detect and locate incursions at an early stage of invasion, so that control strategies can be implemented. Current surveillance methods are limited and rely heavily on divers to detect incursions. The development of new detection methods, that operate at larger spatial scales and can be deployed readily by management agencies, will improve detection capability, leading to reduced management response times and better outcomes. NIWA researchers have developed a method for remote detection of invasive aquatic weeds utilising advances in remote sensing, recognition software and machine learning, initially targeting two of New Zealand's worst submerged aquatic weeds, lagarosiphon (*Lagarosiphon major*) and hornwort (*Ceratophyllum demersum*).

This presentation outlines the development of NIWA's portable invasive species detector module that can be deployed from manned or unmanned surface vessels (USVs) and remotely operated submersible vehicles (ROVs). The project has applied an Artificial Intelligence (AI) Deep Learning (DL) approach to detect submerged target species. A prototype module contains a software 'detector' that has been trained to identify targets in live stream video imagery. When it identifies a target is present within a video frame, the GPS location, the time and the total number of instances detected within that video frame are recorded. The resulting GPS detection file can then be projected in mapping applications (e.g., ArcGIS), so that control or eradication of the weed can be undertaken. The prototype module has been trialled in NIWA's flume facility to determine its ability to detect lagarosiphon, and subsequently initial field testing has been conducted at Lake Wakatipu and the upper Kawarau River (Queenstown, South Island). Whilst the project has primarily developed a detection tool to target invasive submerged weeds in New Zealand waterways, in principle, the system could be used for recognising other relevant target species including pest fish, invertebrates and native species (e.g., taonga species, kōura and kākahi), and is also applicable in the marine environment.

Comparative efficacy of treatments for juvenile *Corbicula fluminea* eradication: a laboratory study

Karen Thompson, NIWA
karen.thompson@niwa.co.nz

Co-authors: Scott Sinclair², Anjali Pande², Che Nathan², Amelia Shepherd¹, Deborah Hofstra¹

¹NIWA (National Institute of Water and Atmospheric Research), Hamilton, NZ

²Ministry for Primary Industries (MPI), Wellington, NZ

Karen is a Principal Technician and Manager of the Chemistry and Ecotoxicology Group at NIWA, Hamilton, New Zealand. She has more than 18 years' experience in the ecotoxicology field and was the recipient of the Australasia Society of Environmental Toxicology and Chemistry (SETAC) Technical Staff Award in 2023 and received the Hill Laboratories Laboratory Technologist Award at the 13th Annual Kudos Awards in 2019. Karen was the elected North Island representative on the SETAC Council from 2019-2023. Karen leads and contributes to multiple research projects and regularly undertakes consulting projects for government departments and regional authorities on a range of topics related to ecotoxicology, native species restoration and rehabilitation, derivation of water quality guidelines, invasive species control, and phytoplankton. She is currently leading the MBIE funded Smart Idea project C01X2306, 'How do native super-producers of organic matter mitigate aquatic metal mixture toxicity?'. Karen conducts a variety of acute and chronic toxicity tests (bioassays) on chemicals, novel compounds, effluents, sediments, and environmental samples, using freshwater and marine organisms including algae, invertebrates and fish including native NZ species. Karen has developed several methodologies including those for the in vitro larvae metamorphosis of a New Zealand native freshwater mussel, Echyridella menziesii and antifouling bioassays.

Corbicula fluminea, a freshwater mollusc native to eastern Asia and commonly known as the freshwater gold clam, is known to be a significant invasive species outside its native range, causing ecological and economic damage worldwide. First discovered in Aotearoa/NZ in the Waikato River in May 2023, the Ministry for Primary Industries (MPI) initiated a biosecurity response, and the clam was legally made an Unwanted Organism making it subject to rules under the Biosecurity Act 1993. Juvenile *C. fluminea* pose a particular biosecurity challenge, as at approximately 0.2 mm in size their 'invisibility' makes it difficult to determine their presence. They are essentially microscopic adults with fully formed shells, making them particularly difficult to target with biocidal agents or treatments, and as bivalves, they may 'clam up' for some time to protect themselves from exposure.

This MPI-funded study aimed to evaluate the efficacy of various treatments against juvenile *C. fluminea* that could support current biosecurity measures (e.g., Check, Clean, Dry), to optimally eliminate the risk of its spread via anthropogenic vectors such as recreational equipment. With Unwanted Organism Permission obtained, adult specimens were collected from Lake Karāpiro and spawned in the laboratory. Obtained juveniles were exposed to chemical (e.g. metals, solvents, disinfectants) and physical stress (i.e. temperature) treatments. The effectiveness of each treatment was assessed at multiple concentrations and acute exposure durations.

This presentation details the results from this study which contribute valuable insights into the management of *C. fluminea* populations, and informs decision-making processes for control strategies. Further phases of research are planned to optimize treatment protocols including the maintenance of target exposure, application methods and the potential risk and impact of using highly hazardous or environmentally toxic treatments.

COMMUNITY COLLABORATION

Biosecurity education - increasing our eyes and ears on the ground

Briar Cook, Tasman District Council
briar.cook@tasman.govt.nz

Briar is a Biosecurity Officer for the Tasman District Council. She has been chasing pests in some form or other for the past decade, through previous work for DOC and Zero Invasive Predators. Briar's current focus is emerging pests and working with rural landowners in some of the far-flung parts of the Tasman District.

With only four Biosecurity Officers roaming the sizeable Tasman District, it's impossible to get around everywhere. Instead, we invest time in educating our residents to help us spot invasive pests. This talk describes how an educational approach can reach many people and increase our eyes and ears on the ground. We actively seek out a wide variety of audiences, from retirees to preschoolers, roading contractors to gardeners, and scout groups to primary schools. The work has resulted in some key discoveries, as well as entertaining social media comments and unusual reports! Come and listen to some of the successes and challenges of the public-facing side of Biosecurity.

Discovering and protecting Tautuku's treasures - challenges and successes seven years on

Francesca Cunningham, Forest and Bird Protection Society, Tautuku Restoration Project Manager
f.cunningham@forestandbird.org.nz

Co-authors: Gavin White, Forest and Bird, Tautuku Pest Control Officer & Petra Simpson, Independent, Tautuku Biodiveristy Monitoring Assistant

Francesca, from Ōtepoti Dunedin in the South Island of New Zealand, has been passionate about conservation since a young child, and was an active member in Forest & Bird's Kiwi Conservation Club. She became involved in bird conservation, mentored by members of the NZ Ornithological Society, after winning a school science fair project about birds on her family's property. She carried on to study at the University of Otago completing a Post Graduate Diploma in Wildlife Management and Master's degree in Zoology. Her focus since has been on bird conservation across a range of threatened species projects in New Zealand, Australia, and South America. This has included working with DOC projects in the South Island, 15 years managing a conservation project for one of the world's rarest birds, the Critically Endangered mangrove finch in the Galapagos Islands, and over seven years managing two conservation projects for Forest & Bird: restoring remnant seabird colonies, and a landscape scale restoration project. While still working for Forest & Bird and overseeing the Mangrove Finch Project, Francesca is now back at university part time completing a PhD focussing on the future conservation needs of the mangrove finch, and she continues to volunteer for a range of local bird conservation projects.

Forest & Bird's Tautuku Restoration project, situated across the MacLennan Range and extending into the Tahakopa Valley in the Catlins, South Otago, aims to conduct effective introduced species control across indigenous habitats for the benefit of native species. Concurrently we are determining which threatened native species persist within the project area to be able to better protect them,

with significant flora and fauna discoveries having been made to date. We work with a wide range of stakeholders to achieve our goals.

Our project area represents the largest remaining lowland mixed podocarp/rātā/broadleaf forest on the Southeast coast of the South Island and encompasses the last two remaining river catchments still under native vegetation from their headwaters to the sea. We operate across a range of habitats encompassing the coastal forest, freshwater wetlands and frost-flat clearings. These habitats are home to endangered native species including the Nationally Critical Pekapeka-tou-roa / long-tailed bat and Matuku hūrepo / Australasian bittern. At risk and vulnerable species including the Tautuku gecko Mokopiriakau southern forest, red-crowned kākārīki, mātātā/SI fernbird, pūweto/spotless crane, and kororā/little blue penguin. Two rivers support several endangered and threatened fish species including tuna/long-finned eel, giant kokopu, *Galaxias gollumoides*, and kanakana/lamprey. The area also supports several species of threatened plant species, including the Nationally Critical Rohutu (*Ourisia modesta*) (7th know site), at least six Nationally Vulnerable species, at least eight At Risk Declining species, and a further 11 Regionally uncommon species. Additional significant flora discoveries continue to be made, along with fascinating invertebrate finds some of which are yet to be described.

The native animal species are at risk from predation by a range of introduced mammals, while feral pigs and deer cause river sedimentation and browse heavily on endemic vegetation. Furthermore, feral pigs cause significant habitat destruction through rooting up the forest floor. As a result, achieving effective conservation management at an ecosystem level is challenging and we aim to prioritise our efforts to try and protect the most vulnerable species within our project area.

To date we have initiated predator and browser control, while species monitoring continues to show the risks faced by some of the key species we aim to protect, demonstrating the fragility of these species combined with the challenges of effective landscape scale introduced species control. At the same time the discoveries of species that were unknown to be in our project area further highlight the importance of the catchments where we work and demonstrate the need for ongoing future conservation efforts to ensure that they not only persist but can once again thrive.

More bang for our buck - The Waikato Regional Council's collaborative model with the Department of Conservation for pest animal control.

Chris Monk, Waikato Regional Council
chris.monk@waikatoregion.govt.nz

Chris has been a Biosecurity officer in the pest animal team for the Waikato Regional Council for 13yrs. The majority of his role is managing contractors who deliver performance possum control across our 550,000ha priority possum control areas (PPCA) utilising both aerial and ground control. Chris also conducts audits of WRC's control and monitoring contractors. There is also a large component of landowner engagement and more recently Iwi consultation. For the regional goat control, the possum control and rabbit issues, there are five DOC officers and multiple local councils to liaise/work with. Other jobs Chris has had are: park ranger for the then ARC; milk man; lifestyle block contractor, involved in sheep milking and a tourist operation; and a contract supervisor for urban fencing in Auckland.

Be it funding, labour or contractors, it makes operational sense for agencies to work collaboratively to achieve their collective goals. In recent years, within the Waikato region there has been approx. 120,000ha of aerial 1080 possum control operations delivered via four scenarios:

1. Operations that were solely funded and delivered by WRC including PCL.
2. Operations that were co-funded and delivered by WRC on behalf of DOC including private and PCL.
3. Operations that are co-funded and delivered by DOC including private land.
4. Operations that DOC solely funds and delivers, including private land.

In the same timeframe, WRC has undertaken 300,000ha of performance possum ground control that buffers PCL to reduce the reinvasion from uncontrolled farmland. This model was developed from early learnings of the TB eradication programme. Within these areas, there are also small DOC reserves that WRC controls that otherwise wouldn't receive possum control, as they don't rank high enough on DOC's priority list but they contribute to the regional benefit for biodiversity and native habitat longevity. Funding from the RPMP exacerbator fund contributes to this control on PCL. The majority of PCL sites are deemed regionally or nationally significant SNA sites under the district councils' classifications.

WRC also provides DOC with funding to engage contractors to control feral goats on selected private land within the region. This allows the contractors to 'follow' the goats as they move from hunting pressure between PCL and private land, or vice versa. The majority of these sites mirror the possum control, acting as buffers around large PCL. In a couple of sites, WRC and DOC are sharing comms to educate landowners in an attempt to create a 2km 'no goat' buffer. A recent example was 1700 goats removed in 10 days of control on private land bordering Mt Pirongia.

Site-Led - a Partnership for biodiversity gains

Sophie Gibson-Pinn, Otago Regional Council
sophie.gibson-pinn@orc.govt.nz

Sophie is a Community Coordinator – Biosecurity - at the Otago Regional Council. Sophie has worked in agriculture and parasitology, and has a Masters in Zoology from the University of Otago.

The Site-Led programme is part of the Otago Regional Pest Management Plan 2019-2029 (RPMP) and seeks to manage additional pests to avoid, mitigate or prevent damage to the indigenous ecosystem values at specific sites. In the RPMP, there are three terrestrial Site-Led Programme areas located in Dunedin. The key role of Otago Regional Council in the Site-Led Programmes is advocacy, education, and collaboration to guide support for community groups and agencies in bringing about the desired level of environmental protection. Through this programme, we have been engaging with 42 community groups to help facilitate collaboration between groups, and to maintain the gains these community groups have achieved over the years in the pest plant and pest animal management space. To deliver this programme and achieve these outcomes, we have established a partnership with mana whenua with representatives from Te Rūnanga o Ōtakōu and Kāti Huirapa Rūnaka ki Puketeraki. The purpose of this working group is to oversee and provide guidance for the development of priority activities and facilitate support to implement the Site-Led Programme. To date, the Working Group has carried out several key activities to support these community groups achieve positive biodiversity outcomes.

PLENARY

How is Predator Free Dunedin contributing to the national PF2050 strategy?

Rhys Millar, Predator Free Dunedin
rhys@predatorfreedunedin.org

Rhys is the Project Lead for Predator Free Dunedin. Predator Free Dunedin is a membership of 22 organisations working collaboratively, and is being delivered by three Delivery Partners who are leading on-the-ground efforts.

Predator Free Dunedin is one of 18 funded landscape-scale projects contributing to the national goal of eradicating possums, stoats, and rats across Aotearoa by 2050. Each of the 18 projects has its own focus and approach. So how is Predator Free Dunedin contributing to the national strategy?

Five years on, we have removed nearly 60,000 possums, over 20,000 rats and nearly 2,000 mustelids from Dunedin's landscapes. Currently, our focus is on eradicating possums on the Otago Peninsula. New tools and techniques have been essential to our progress on this including the use of detection dogs and thermal drones.

New technology is also being used to improve operations in zero-density zones, including AI self-resetting traps that both improve the efficiency of predator control, reduce risk associated with unwanted bycatch, and can be used for biodiversity monitoring.

Community support has been essential to the project's success so far. Dunedin's local community and hundreds of volunteers have contributed thousands of hours to the project, alongside a multitude of conservation groups across Dunedin which this project is proud to support. Improving native biodiversity should inform all that we do, and we are increasingly hearing reports of native wildlife being seen in new areas.

DOC's Conservation Dogs Programme: the canine mahi supporting conservation and biodiversity efforts, now and for the future

Angela Newport, Senior Advisor Pest Detection Dogs - Conservation Dogs Programme

Co-author: Adeline Bosman, Department of Conservation

Many of you would have met Ange who has been a pest detection dog handler and member of the Conservation Dogs Programme for 14 years, both as a DOC staff member and a contractor. Ange has a wealth of knowledge and experience and currently runs two pest detection dogs: Almo on mustelid detection, and Sika on feral cat detection.

The Conservation Dogs Programme is an integral part of maintaining the gains, both in pest and species work.

Islands - maintaining the gains

Stephen Horn, Department of Conservation
shorn@doc.govt.nz

Stephen is the Manager of DOC's National Eradication Team. He has worked on the rabbit eradication on Australia's Macquarie Island, led DOC's eradication of mice from Antipodes Island, and the feasibility study investigating eradication of pigs, mice, and cats from Auckland Island. He lives in Invercargill with Karen and daughter Kiah.

Islands are places of vulnerability and opportunity for biodiversity management. Islands make up about 5% of the earth's dry land but they hold more than a third of the world's threatened species. Most of the world's species extinctions since 1500 have occurred on islands and most of those have been caused by invasive species. The important opportunity islands give us is that eradication of invasives, and preventing reinvasion, is often possible. Worldwide, there have been over 1200 invasive mammal eradication projects and the success rate is around 85%.

New Zealand's World Heritage-listed Subantarctic region comprises some of our most important places biologically. The arrival of various mammalian pests with human activity caused over 200 years of degradation at some sites in the region. Over the past 30 years, New Zealand has progressed towards a pest-free New Zealand Subantarctic region. Now the main Auckland Island is the last place where mammalian pests remain, and plans are evolving to achieve this last but major milestone.

An iterative approach for island eradication has seen lessons from each ambitious project enabling increasingly complex objectives. However, the challenge of preventing pests from re-establishing is growing as we push the boundaries of eradication and environmental conditions. Here we look at some examples of changes and challenges on our southern islands including the Subantarctic and Fiordland, and innovations such as novel bait tools and use of technology to better protect our most precious places.

Incorporation of mātauranga Māori in biosecurity responses of taonga species.

Jane Kitson, Kitson Consulting Ltd
jane@kitsonconsulting.co.nz

Dr Jane Kitson: Ngāi Tahu ki Murihiku (Ōraka-Aparima, Waihopai and Awarua Rūnanga). Jane is an ecologist and environmental scientist with research interests in freshwater, mahinga kai and cultural monitoring. She is the director of Kitson Consulting Ltd, a company that links values and science to support manawhenua in their environmental management aspirations and needs. Jane is involved in a number of mahinga kai/taonga species and customary fisheries research projects in Murihiku.

Taonga species are flora and fauna for which iwi, hapu, or whanau have kaitiaki responsibilities. The relationship between kaitiaki and taonga species is defined by whakapapa, mātauranga Māori and embedded in cultural identity.

This presentation uses the case study of the taonga species - kanakana/pouched lamprey and illustrates how the monitoring of the Lamprey Reddening Syndrome response in Murihiku (2011-2015) relied on mātauranga of customary harvesters, and a community-wide response. This presentation will also present further considerations for incorporating the relationship between kaitiaki and taonga species as part of future biosecurity responses, to go beyond 'maintaining the gains' for biosecurity and biodiversity.

GEMS

A New Beast: The Masters in Applied Science (Biodiversity Management)

Diane Fraser, Unitec
dfraaser@unitec.ac.nz

Diane has been working at Unitec for many years in a range of roles including programme development, academic quality systems, programme coordination, and of course teaching. Diane's teaching ranges from biosecurity and ecological risk management to zoo animal husbandry and now includes, along with her colleagues, the development and teaching of a biosecurity course in the new Masters of Applied Science (Biodiversity Management) in the School of Environmental Sciences, Unitec.

Effective response to biosecurity threats in a range of modified and natural ecosystems in New Zealand is hampered by staff capability and capacity gaps. A new Masters in Applied Science (Biodiversity Management) programme delivered by Unitec, Institute of Technology, that combines a number of taught courses with a thesis, is an attempt to address these gaps by teaching biosecurity in the holistic context. Direct biosecurity content is supported by courses in restoration ecology, environmental monitoring, social science/behaviour change, partnership and stakeholder engagement, Mātauranga Māori, risk assessment and GIS. The aim is to produce well-rounded graduates with theoretical and practical skills to support the biosecurity and wider conservation industry. This presentation will showcase the structure and content of the study options of this new programme.

Parma wallaby species discovered in the Bay of Plenty

Michelle Archer, Place Group
michelle@placegroup.co.nz

Co-authors: Dale Williams and Davor Bejakovich, Bay of Plenty Regional Council; Dave Byers, Waikato Regional Council; Andrew Veale, Manaaki Whenua Landcare Research

Michelle has undertaken a wide range of projects throughout her career, which started in the electricity industry, including resource consent management, managing ecological and geomorphological monitoring and iwi and stakeholder engagement. Understanding the impacts of hydro and thermal power stations led to a keen interest and greater understanding of freshwater ecology and water quality. Michelle is also an experienced Project Manager having delivered a number of construction and restoration projects in the Waikato and Bay of Plenty Regions. Since

2017, Michelle's key focus has been on freshwater biosecurity in the Waikato Region, in particular koi and she has provided operational support to the National Wallaby Programme for the last two years.

In 2023, it was announced by the Tipu Mātoro National Wallaby Eradication Programme that parma wallaby (*Notamacropus parma*) was present in the North Island. Already established on Kāwau Island, this is the first time it has been found on mainland New Zealand. Parma wallaby is a genetically separate species to the already well-established dama wallaby (*Notamacropus eugenii*) in the Bay of Plenty.

Manaaki Whenua Landcare Research discovered the species during research into the genetic variation of dama populations from tissue samples collected by the Bay of Plenty Regional Council. Operational activities in the Bay of Plenty now need to consider the two species, as their unique behavioural traits may require changes to ensure the best methods for targeting dama and parma wallaby.

Phase reporting for landscape scale weed control to show how you are maintaining the gains

Chris Rowse, Project De-Vine Environmental Trust
11nikaus@gmail.com

Chris started Project De-Vine in 2004 and had gone on to raise over \$2.7 million in funding and running a paid field team of 20 plus and an office team to achieve a landscape scale clearing of many pest plants and now added more recently wilding pines and predators from Golden Bay in Tasman.

Phase reporting is applied to all the properties in a landscape scale control project where there are pest plant species. This project covers 4000ha and the 437 properties >1200m² in the Lower Takaka Valley. Assessing determines how many properties are clear, infested and those who do not want to be involved in the project (very few).

In Phase one this is the state before we start the control work where there are primarily mature plants. Phase two is reached after the first sweep which has controlled most mature plants. Phase three is reached after the second sweep to control the plants with all remaining mature plants and many seedlings controlled. This is referred to by DOC as the zero-density state. Phase four is reached after repeating enough sweeps for the seedlings numbers to be low. After this, visits need to occur before any seedlings become mature enough to produce seeds - usually bi- or tri-annually.

The phase graphs show the three key plants being controlled: Banana passion vine, old mans beard and woolly nightshade. They show the 'actual' hectares of infestation over the whole 4001ha. BPV and WNS were quite infested in this primarily dairy farming project area, with about 115ha and 145ha respectively. OMB is about 10% of the infestation level of the other two and was not controlled as much. WNS was a higher priority as it had recently spread here and hence the seed bank was less.

You can see how the 'at the start' columns in blue change, after three years from primarily phase ONE, to a mix of mainly phase TWO or THREE or even FOUR in the red 'at the finish' columns. With this system many projects can be summated with the aim to one day combine all the data once all of Golden Bay has received these initial three-year knockdown projects, hopefully by 2030.

Banana passion vine seedling count over 13 years Project De-Vine

Chris Rowse, Project De-Vine Environmental Trust
11nikaus@gmail.com

Chris started Project De-Vine in 2004 and had gone on to raise over \$2.7 million in funding and running a paid field team of 20 plus and an office team to achieve a landscape sale clearing of many pest plants and now added more recently wilding pines and predators from Golden Bay in Tasman.

A long-term seedling count on four properties in Clifton on Rocklands Road, Clifton in Golden Bay. All were already rid of mature plants before the grants to control pest vines on their neighbouring properties were given. It included Chris's, two neighbours, and another property down the hill. The numbers with 6-monthly tallies in the table show the ups and downs due to various events happening.

The crusade to rid the Bay of BPVs continues.

Field efficacy in New Zealand conditions of Hoggone meSN Feral Pig Bait®

Finlay Cox, Department of Conservation
fcox@doc.govt.nz

Finlay is a Work Stream Lead for Department of Conservation's National Eradication Team. His experience is in animal pest management ranging from small mammals to ungulates. His recent focus has been on island eradications; he has been researching different aspects of feral pig management as part of the Maukahuka Pest free Auckland Island Project.

Feral pig distribution has been increasing in New Zealand (NZ) due to natural dispersal and illegal liberations. Their destructive feeding habits are having an increased impact on primary industries and biodiversity. Sodium nitrite is a commonly used food preservative that in low doses kills pigs quickly and has been developed as a Vertebrate Toxic agent (VTA) bait. Bait-Rite® has been registered in NZ but has provided mixed field results. In contrast a similar Australian bait, Hoggone meSN Feral Pig Bait® has demonstrated higher stability and efficacy. A trial was undertaken in Southland using automatic corn feeders to attract pigs to sites where they could be transitioned to bait stations and the Hoggone meSN Feral Pig Bait®. Efficacy was estimated to be at least 61% but likely as high as 91%. Recovered carcasses showed no signs of distress and were found in close proximity to bait stations suggesting a short latent period and humane death. The bait offers huge potential as an effective, passive control method. NZ registration and importing/distributing channels are being actively pursued with the manufacturer. Additional development and field trials will allow the improvement of delivery across a landscape and will further inform population reduction.

Targeting high risk invaders before they establish to protect freshwater ecosystems

Hayden Kinraid, MPI
hayden.kinraid@mpi.govt.nz

As an Adviser - Environment Health Biosecurity NZ/MPI, Hayden leads the development of the MPI Freshwater Surveillance Strategy for new-to-NZ organisms. Previous to this he worked at Taranaki Regional council as a Biosecurity Officer and PF2050 Project lead

This programme of work seeks to provide partners across biosecurity network with the scientific information required to enable the early detection of invasive species in freshwater environments. Below is a summary of the programme of work:

Recent incursions (e.g., freshwater gold clam, *Corbicula fluminea*) and scientific reports have highlighted the need to improve freshwater surveillance for new-to-NZ invasive species. To address this, we have developed freshwater surveillance strategy and work programme. The work programme is divided into three workstreams and will encompass organisms from across the various freshwater taxa: invertebrates, plants and fish, with microorganisms to possibly be included later. The work programme also provides a basis for leveraging further opportunities to enhance freshwater surveillance for new-to-NZ species and extensions for established pest species, which is currently largely based on general surveillance only (i.e. observations by the public, regional councils, etc).

The key deliverables for the work programme are outlined below:

Workstream 1: Risk profiling for exotic freshwater organisms: Focused into three different organism groupings - freshwater invertebrates, fish, and plants. For each grouping past and existing research has been collated and reviewed. Where gaps were identified, new research is being undertaken to create an up-to-date freshwater species risk profiling.

Workstream 2: Modelling high risk sites: This workstream seeks to build on the risk profiles, identifying high risk freshwater systems and pathways which will facilitate the rapid detection of new to NZ organisms by focusing surveillance effort on areas most at risk.

Workstream 3: Engagement: identify and connect with key Māori partners, enhance existing relationships with key organisations already working in the freshwater space and provide national leadership to improve existing surveillance capability.

Chilean myrtle (*Luma apiculata*) - an update on this alarming emerging weed

Kate McAlpine, Department of Conservation
kmc Alpine@doc.govt.nz

Co-authors: Briar Cook, Tasman District Council & Fiona Thomson, Department of Conservation

Kate is a weed ecologist and science advisor at the Department of Conservation.

Chilean myrtle (*Luma apiculata*) is a hardy, evergreen tree with distinctive orange bark that appears likely to become a serious weed in New Zealand. Chilean myrtle tolerates a wide range of light environments, from full sun to deep shade, and plants can establish in a wide range of habitats, from dry grassy sites to wetlands. It produces copious fruits, and seeds are widely dispersed by birds. Seedlings are very shade tolerant and can form dense colonies under closed canopies, dominating invaded sites and excluding other species. Chilean myrtle can even look 'weedy' in its native range (Chile and Argentina). Seedlings are difficult to detect in the early stages of invasion, and there is emerging evidence that Chilean myrtle can be difficult to control with herbicide. Cut stumps can

resprout, and branches can take root where they touch the ground. It is widely planted in gardens in New Zealand but is not yet common in the wild. It was first recorded naturalising near Invercargill in 2002, and more recently in Nelson, New Plymouth, Christchurch, Gisborne, Dunedin and Rakiura. There is a 94.7% climatic similarity between overseas records of Chilean myrtle and the New Zealand climate, so Chilean myrtle has the potential to invade forest ecosystems and displace native plant species throughout the whole of New Zealand. It may also be a vector for myrtle rust. It is likely that this emerging weed will eventually be added to the National Pest Plant Accord, but this may take several years. In the meantime, the continued sale of Chilean myrtle plants is likely to result in further spread from gardens into native ecosystems. The Department of Conservation has asked the New Zealand Plant Producers Incorporated and the wider ornamental horticultural industry to take a voluntary approach in removing this major weed from sale.

Reducing regulatory compliance risk - Aquatic herbicides

Hannah Palmer, Place Group Ltd
hannah@placegroup.co.nz

Hannah is an environmental consultant for Place Group Ltd who has particular experience in working on multi-agency projects to deliver shared outcomes in the biosecurity, biodiversity and wider environmental fields. She enjoys finding ways to simplify operating environments, improve effectiveness, and create efficiencies and outputs that make a difference. Hannah has been managing the EPA permissions process for aquatic herbicides on behalf of the Regional Biosecurity Sector since 2013, and was co-author of successful business cases to the Central Government on simplifying the regulation of aerial 1080 operations, and increasing the effectiveness of wallaby management and control in New Zealand. Outside of work, Hannah enjoys tramping, identifying and photographing bugs.

In 2023, Place Group Ltd prepared a joint submission to the Environmental Protection Agency's Call for Information on the reassessment of six aquatic herbicides. This submission was prepared with input from the Regional Sector, Biosecurity NZ, DOC and LINZ. In the year that has followed, issues surrounding the regulatory framework for aquatic herbicides have continued to surface. This GEM provides a brief overview of where we are at with the EPA reassessment, and how we can take practical steps to increase compliance with the current regulatory framework to maintain the gains we've fought so hard to achieve.

Translocation of Kiwi to Ngati Kawa at Paihia

Ngati Kawa Taituha

An update on some of the amazing biosecurity/biodiversity work undertaken by Ngati Kawa.

Hedgehope School continuing the legacy of Sherwood Forest

Students from Hedgehope School.

Hedgehope School, a small rural Southland primary school have been utilising the Enviroschools programme to help frame their Environmental Education projects. By utilising the Enviroschools kaupapa, students get a broader understanding of the objectives they set out to achieve and enable students to be the drivers of change within the community. The program also weaves in many concepts associated with Te Ao Maori, which helps to link to the NZ curriculum and local Iwi.

Students from Hedgehope School are taking on a restoration project within Sherwood Forest, a rare flood plain forest, dominated by giant matai. It is now a rare example of the podocarp forests that once grew on the Southland floodplains. The area is also home to threatened or regionally uncommon trees and shrubs such as Hector's tree daisy, fierce lancewood, white mistletoe and scrambling fuchsia. Sherwood Forest is a QEII Open Space Covenant, with over 30 years of stock exclusion, predator and weed control and supplementary planting around the edges by previous owners. Students have been working with key stakeholders to help them understand the significance of this site. Listen to the students tell us how they are continuing to protect our valuable natural taonga. Ensuring it is protected now and into the future for the next generation to enjoy.

Biosecurity dogs and weeds detection

John Taylor and Wink

This GEM will be an introduction and a display of what a weeds biosecurity dog can do!