

Protect

PROTECT SPRING 2022















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Keen young minds

In this issue we celebrate the achievers in the biosecurity sector through both the Biosecurity NZ Awards and the Institute's own Study

Keen young minds are on the path to helping New Zealand sort out two important threats kauri dieback and pest fish. The purpose of the NZBI Study Awards is to benefit practically all members of the institute as they do their work and contribute constructively to biosecurity and aims of the institute in general.

A new word appears in this issue. Maybe the word 'pestival' will become a feature of the New Zealand vocabulary.

We also learn why Environmental DNA (eDNA) is most definitely a cool technology, literally.

Aquatic pests feature as well, and we learn that the debate over how to best manage them has been around for a long time.

CHRIS MACANN **E**DITOR

Sun, Sand, Ngahere, Awa... Knapsacks, Traps, Inspections and **Invasive species**

A short message wishing all NZBI members a safe and productive summer and holiday season. For many members it is prime-time for crucial pest management activities or biosecurity risk management programmes. The invasive species we all grapple with don't rest up and make Christmas cakes or prep the ham! However, as important as our work is to protect our piece of paradise, we are all only human - so make sure you do take a break and enjoy some of that cake and ham (not together though!).

It has been great to hear of some increased Branch activity around the country and at the recent NZBI Executive meeting, a blast from the past (quite literally) is looking to make a comeback. Keep an eye out for the new NZBI Postal Shoot which is about to be released, where the shooting trophy formally competed for at NETS will be up for grabs in addition to a new team award. This idea has been floated for the last couple of years and is intended to recognise our many professional firearm users doing excellent work out there while also providing an opportunity for some old-fashioned competition, maybe some rivalry and last but not least - comradery amongst members. Watch this space.

Again, wishing you all a great summer season and into 2023.

Ngā mihi nui,

JONO UNDERWOOD

PRESIDENT, NZ BIOSECURITY INSTITUTE



Postal shoot tropy plate close up

NZBI News

Sophie finally gets her reward

Sophie Badland, from New Zealand Winegrowers finally got her reward after receiving the NZBI Stook Award for best newcomer presentation. Sophie, having made her way to NETS2022 in Christchurch, had to make her presentation on-line from "just next door", when she found she needed to self-isolate.



On as well as in Lake Karapiro: NZBI 2022 Scholarship

A keenness to protect Lake Karapiro, for more than one reason, has earned Waikato student Ashton Reiser one of two 2022 NZBI Scholarships made this year.

In 2023 Ashton will begin a masters thesis looking at the invasive fish community in Lake Karapiro, in the Waikato. Ashton's goal is to assess the distribution, abundance and environmental impact that the invasive fish are having on Lake Karapiro's ecosystem.

He has more than just a passing interest in the welfare of the lake as he explains:

"As a high-performance canoe racer, I paddle on the lake up to twice a day and I get to experience first-hand how special the lake is, the need to protect it and why we need to understand more about it. Invasive fish are becoming a significant, spreading problem in the Waikato, most notably goldfish, koi carp, catfish and rudd. They are known to exclude native fish populations and significantly decrease the water quality of the watercourses that they invade.

My hope is that this research will contribute to the wider invasive fish investigations that are going on along the length of the Waikato River. I have selected Lake Karapiro as my study site for its significance as the lowermost dam on the Waikato River as well as due to the special relationship that I have with the lake.

This is especially important on Lake Karapiro as it hosts a range of significant native fish populations, a multi-million dollar recreational and tourist industry and it supplies the drinking water for a large population of people in the Waikato. My hypothesis is that the spread of these invasive fish is only going to get worse as climate change increases, warming the ambient temperature of the water, and allowing these fish to spread further south."



2022 NZBI Study Award recipient Ashton Reiser, when he's not looking for pest fish.



NZBI News



Ashton with the tools of study.

Ashton is aiming to reach the Paris 2024 Olympic Games for New Zealand in Canoe Sprint. Ashton says:

"I am very grateful and humbled to be awarded the NZBI scholarship for 2023. This scholarship will be pivotal in making my thesis project a success as the contacts and the financial support that come with this award will be critical in helping me to assess the most efficient, accurate and economically viable way to detect pest fish species in lakes in NZ. The end goal of my research is to support biosecurity in NZ and around the world to detect aquatic pest species early and thus limit their spread and the potential damage that they can cause to the environment, the economy and to local communities. Environmental DNA sampling is not cheap so I am very thankful to the NZBI for helping me out with some of my fieldwork expenses."

The purpose of the scholarship is to provide funds to assist with an individual's research to improve knowledge in the field of biosecurity.

The Selection Committee considered the value of the research to furthering New Zealand's biosecurity interests and its practical relevance to the aims of the NZ Biosecurity Institute.

Screening for resistance to kauri dieback: NZBI 2022 Scholarship

A wish to discover more about what causes kauri dieback has earned Otago University student Scott Heslop one of two 2022 NZBI Scholarships made this year.

Scott's research aims to determine if a protein (GH12) of the agent causing Kauri dieback disease can be used to screen plants for resistance against kauri dieback. He will look for plants that may be capable of detecting this protein's presence and initiating an immune response to prevent successful kauri dieback infection.

Says Scott: "These effector screening methods have the potential to be used for the identification of kauri that carry resistance towards one of the key effectors involved in the virulence of *Phytophthora agathidicida* and improve our current understanding of how *Phytophthora agathidicida* achieves virulence against *Agathis australis* by characterising some of the pathogen's key effectors."

"This award will be a huge help to me over the next year. A big part of my project, and any research really, is built on collaboration with other researchers and iwi across New Zealand, sharing techniques and knowledge for working with the pathogen that causes Kauri dieback disease.

"The money from this award will make travelling to see what other researchers are doing in person, and sharing ideas, far more feasible, while also helping to make the costs of a Masters sting just a bit less."



2022 NZBI Study Award recipient Scott Heslop.

Clean Your Gear, Watch Your Pets, Garden Safely

The Institute prepared this media release for the summer holiday period, to enable all New Zealanders to help members carry out their work







Clean your gear, watch your pets and garden safely this holiday season.

These are three simple requests from those that look after biosecurity in New Zealand.

The call comes from the New Zealand Biosecurity Institute (NZBI) - the membership organisation for all people working to prevent or manage damage caused by invasive species.

Institute President Jono Underwood said that keeping NZ safe from unwanted organisms is complex and needs to be fought on many fronts, but the vital contribution every New Zealander can make can be summed up by adopting three very simple habits.

Keep outdoor recreation equipment clean and dry, especially boating and fishing gear.

Desex pets, particularly cats, and prevent them from roaming.

Compost garden waste onsite or dump it at a recognised facility.

Mr Underwood said many pests are spread from garden waste being dumped inappropriately, and by gardening products like compost and potting mix being moved around, as well as by people unintentionally trading possible pest plants that look great in the garden, but not so great when they take over natural ecosystems.

"We are also asking that people do not dispose of aquarium contents into any kind of waterway. Pest fish and aquatic weeds as well as turtles are causing problems in waterways due to aquariums being emptied into sewers, drains and waterways."

Mr Underwood said kiwis can also help NZBI members in a big way by keeping an eye out for anything unusual or out of place as they get about this summer.

He said one particular pest to look for this year are wallabies outside their containment areas in South Canterbury and around Rotorua.

Any reports should be made to the local regional council or Biosecurity NZ.

"Every year NZBI members spend thousands of hours controlling or managing the risks to the economy and the environment from the effects of invasive species."

"This is work which costs the country hundreds of millions of dollars each year through control, research and border control budgets. This money is coming out of all New Zealanders' pockets. However, this work prevents a far greater cost to those same pockets in the future," Mr Underwood said.

Environmental DNA technology a winner among many

Biosecurity New Zealand announced its Biosecurity Awards winners for 2022 at the end of October.

New Zealand Biosecurity Institute members were among those involved in projects recognised by the awards.



Winners one and all. The Whakatipu Wilding Conifer Group successfully undertook wilding conifer control across 53,717.77 hectares of challenging terrain.

Here is a summary of the winners' citations:

The New Zealand Biosecurity Supreme Award

The New Zealand Biosecurity Supreme Award went to Environmental DNA monitoring firm Wilderlab which has developed technology that means just a cupful of water can now reveal what native and pest species are present.

Environmental DNA (eDNA) refers to traces of genetic material that are naturally left behind in the environment by its inhabitants.

WilderLab's monitoring method offers a powerful and scalable solution for the monitoring-at-scale needed to support New Zealand's biosecurity and biodiversity, in water and on land. WilderLab empowers community groups, scientists and biosecurity practitioners with its eDNA detection tool. This innovation has driven an exponential uptake of eDNA monitoring across Aotearoa.

With large-scale adoption by Regional Councils, the Department of Conservation and other government agencies, the technology is now an essential tool in New Zealand's biosecurity toolbox. The technology means thousands of kilometres of waterways are being monitored for tens of thousands of species every week, with several early detections of invasive organisms leading to successful eradications.

WilderLab also won the Mondiale VGL Innovation Award.

The Minister's Biosecurity Award

The Minister's Biosecurity Award winner was Phillip Karaitiana from Gisborne District Council.

Phillip Karaitiana has dedicated his career to protecting the Wairoa and Gisborne regions from pests and diseases. He has been mentoring and managing in biosecurity through his role as Team Leader at Gisborne District Councils for the last 52 years.

Phillip is perhaps one of the longest standing pest management/biosecurity practitioners in the country. His work traverses the past to the present, with early biosecurity employment involving horses, dogs and shotguns to chase rabbits and now working in the era of eDNA, artificial intelligence and drones.

Known for his resilience and adaptability, Phillip is highly respected as a trainer, educator and mentor. He works tirelessly to ensure Gisborne contributes to national regional sector biosecurity projects and inter-regional projects.

continued



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BioHeritage Challenge Community Award

The Whakatipu Wilding Conifer Group won the BioHeritage Challenge Community Award.

In 2021, The Whakatipu Wilding Conifer Group (WCG) successfully undertook wilding conifer control across 53,717.77 hectares of challenging terrain.

WCG runs the Whakatipu Wilding Conifer Control Programme through a longstanding partnership between the Queenstown community, Queenstown Lakes District Council, and the Department of Conservation. The group has established a solid reputation within a Whakatipu community as varied as the climate in the area. It has the support of landowners from huge high-country stations through to lifestyle blocks and suburban communities, as well as the recreation and tourism communities.

The group has also gained the support of the Otago Regional Council and Land Information New Zealand to combat wilding tree spread in the Whakatipu area.

The key to the success of the programme has been the passion, commitment and leadership provided by the community through WCG's effective management system. This system enables the majority of funding to be spent on the ground, helping turn the community's dreams of 'wilding free landscapes' into a reality.

Finalists for this award were Environment Southland's Jobs for Nature Fiordland Weed Buffer, and Pest Free Howick.



On the ground - all part of the National Wilding Conifer Control Programme.

New Zealand Biosecurity Māori Award

Te Arawa Lakes Trust won the New Zealand Biosecurity Māori Award.

Biosecurity issues continue to have major impacts on the tipuna roto (ancestral lakes) of Te Arawa. In recent years, Te Arawa Lakes Trust (TALT) has been at the forefront of initiatives to resolve these issues and create employment for its people.

Invasive fish, mammals and pest weeds (aquatic and terrestrial) have driven taonga like koura, kākahi beds, inanga, koaro, and tuna to the brink of extinction. TALT's biosecurity plan has mātauranga and tikanga-based solutions and focuses on building people's skills and wide community engagement.

Its team of sworn biosecurity officers has grown to 21 and conducted over 5000 boat inspections to limit the spread of weeds between lakes. The Trust has worked with 35 schools from around Rotorua to eliminate catfish.

The Trust undertakes wetland restoration mahi and trials to create flax mats or uwhi for the control of aquatic pest weeds, training Te Arawa whanau to become scientific divers in the process. Te Arawa Lakes Trust has become a key player in the region's biosecurity sector, and led to the creation of over 70 jobs for iwi.

Finalists in the category were: Kauri Ora – the Kauri project, and Ruawāhia/ Mount Tarawera Wilding Pine Control Group.

Sector News

New Zealand Biosecurity Kura Award

Howick School's Moth Plant Competition won the New Zealand Biosecurity Kura Award.

Auckland has the unenviable reputation of being the "weediest city in the world". The four local community boards have, with specialist advice, identified pest plant threats they want reduced in their areas, including the very invasive moth plant.

The innovative Howick School's Moth Plant Competition was created to engage and educate local students in biosecurity. Each year the competition reaches early childhood centres, primary, intermediate and secondary students, teachers and whanau. Challenging tamariki to become committed to moth plant eradication, and the creative approach to biosecurity engagement has produced outstanding results.

Students have collected approximately 148,000 moth plant pods and seedlings so far - achieving positive biosecurity outcomes for not only Howick but also the Otahuhu Mangere, Ōtara Papatoetoe and Orakei local board areas in Auckland.

This competition is proudly growing a new energetic group of conservation volunteers throughout the local board areas.

Finalists in the Kura category were Taipa Area School - Project Predator, and Halfmoon Bay School - Te Kura o Rakiura.

GIA Industry Award

Auckland Airport won the GIA Industry Award for "A Biosecurity Culture to Make Biosecurity Matter."

Auckland Airport has elevated biosecurity from being something that border control staff do in the passenger arrivals area, to something the whole airport community understands and is involved with.

In doing so, the company has created a culture and a team of biosecurity champions, through growing awareness and engagement among its own workers as well as the staff of airlines, ground handlers, tenants and border agencies at the Airport.

Through awareness raising, training, documentation, standard setting and creation of a biosecurity community, biosecurity is now a foundational value for the company. This prioritisation is visible in all aspects of its business.

To date, over 10,000 workers within the wider airport community have completed Auckland Airport's online biosecurity training.

Because Auckland Airport is New Zealand's largest international airport, receiving passengers and goods from around the globe, it is a first line of defence at New Zealand's air border. By supporting a strong border, the company is helping keep Aotearoa free from exotic pests and diseases.

Finalists in this category were: Onside and Kiwifruit Vine Health - Network Technology Partnership, and Aquaculture New Zealand -Protecting a Promising Future: Leading the Way in Aquatic Biosecurity.

Eagle Technology Local and Central Government Award

MPI's National Wilding Conifer Control
Programme won the Eagle Technology Local
and Central Government Award.

The National Wilding Conifer Control Programme (NWCCP) led by Biosecurity New Zealand within the Ministry of Primary Industries (MPI), has controlled wilding conifers on over 2.5 million hectares of affected land across New Zealand since 2016.

The programme is a textbook example of successful integration and collaboration between central and local government, industry sectors, mana whenua, communities, and land holders.

This combined approach is critically important because of the scale and complexity of the problem. If left uncontrolled, wilding conifers could invade over a quarter of New Zealand in 25 years, with a potential cost of over \$5 billion.

Wilding pines spread at exponential rates across vulnerable land

continued



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The Programme has made major progress toward eliminating the wilding threat because it has been able to effectively involve a wide range of affected stakeholders, working collaboratively to focus collective resources and efforts to tackle the wilding population.

Finalists in this category were AsureQuality Ltd - Blackgrass Canterbury Response 2021-22, and the Wellington City Council Urban Ecology Team.

New Zealand Biosecurity Science Award

The Better Border Biosecurity (B3) Research Collaboration won the New Zealand Biosecurity Science Award.

B3 is a multi-partner, cooperative science collaboration in New Zealand. B3 researches ways to reduce the entry and establishment of new plant pests and diseases.

It is a unique research collaboration between crown research institutes, universities, and government agencies with operational border biosecurity needs. Through co-innovation, and with industry, iwi, and community interests, B3 has delivered tangible and substantial impacts to New Zealand biosecurity.

These include biosafety for pre-emptive biological control, sentinel plants to support native plant heath, genetic databases, and prototype surveillance and response tools.

B3 undertakes integrated research across risk assessment, pathway risk management, diagnostics, surveillance and eradication. Its mahi plays an important role in delivering the world-class scientific knowledge and tools required for New Zealand's biosecurity system to be resilient and worldleading.

Finalists in this category were Manaaki Whenua Landcare Research for its Weed Biocontrol Group, Scion Research, Apiculture NZ, Plant & Food Research - Giant Willow Aphid Biological Control Group.

Mondiale VGL Innovation Award

Finalists in this category won by WilderLab NZ Ltd were Kiwifruit Vine Health and Onside - using network technology for biosecurity readiness and response in the kiwifruit sector, and Bay of Plenty Regional Council – GeoPest.

AsureQuality Emerging Leader Award

Ethan McCormick of Pest Free Howick Ward and Friends of Mangemangeroa won the AsureQuality Emerging Leader Award.

Ethan shines as an emerging leader totally dedicated to teaching and inspiring youth to protect their local environment.

He has a strong vision for a thriving predator free New Zealand and he works tirelessly with his community and teachers and students from 44 schools in Auckland to pass on his passion for biosecurity.

Ethan combines his environmental study as a university student, with being a central member of the Pest Free Howick Ward team and Friends of Mangemangeroa Trust. He runs regular pest free workshops for teachers and Envirogroups, 'Pestivals', and community pest education. He is also piloting a cadet programme at Somerville Intermediate.

Through a structured and analytical approach, Ethan has expanded his environmental leadership from a high school focus, to contributing to environmental action in Mangemangeroa Reserve, Cockle Bay coastal bush, the schools of Howick, and the wider Howick community as a whole. Ethan's leadership has normalised predator-free activity for the people of Howick, creating an ethos of 'this is what we do'.

Finalists in this category were Alessandra Smith - Northland Regional Council, and Juliet O'Connell - Bay of Plenty Regional Council.

Four years hard mahi sees off rogue water weed

The champagne was finally uncorked earlier this month to mark the eradication of a highly invasive water weed from a Tauranga waterway.

The weed in question is the aptly named Salvinia molesta, one of the world's worst freshwater floating weeds, which in early 2018 took less than a month to infest a one-kilometre stretch of the Wairakei Stream at Papamoa.

AsureQuality Biosecurity Technical and Contracts Manager, Peter Wilkins says "AsureQuality manages such infestations for the Ministry for Primary Industries (MPI) under the National Interest Pest Response (NIPR) Programme", and the AsureQuality team was quickly brought in to tackle the issue. "Salvinia grows rapidly and can smother the surface of a lake or river, destroying the living environment for native life and potentially posing a drowning risk."

Peter, who led the AsureQuality efforts, says a broad team, including Tauranga City and Bay of Plenty Regional Council workers and members of local iwi Ngā Pōtiki, removed most of the salvinia in the first week, then returned every fortnight for the following year to clear any residual weeds, as salvinia can quickly regenerate from even a small fragment. After no salvinia was found for three months, the site was then inspected by AsureQuality Field Officers Diane Dahlkamp and Mel Helbron every four months for another three years – leading to last month's MPI declaration that the weed had successfully been eradicated.

Ngā Pōtiki representatives also ensured the work was carried out in line with cultural protocols and the eel population in the stream wasn't affected by the removal process.

Peter says the biggest challenge on the project was the sheer size and spread of the infestation and the amount of waterway that had to be inspected – and then any residual weed removed – over an extended period. "Ironically, heavy rainfall and a flood of the waterway caused by salvinia blocking the outlet to the sea was turned from a problem to an advantage: we used the high-water level to flush a lot of the weed out to sea, where it died - it won't survive in salt water."

While it's gone from Papamoa, Peter says the country still needs to be vigilant about the weed - particularly in the upper North Island. "It will turn up again."

CONTRIBUTED BY ASUREQUALITY



Salvinia infestation before control.



Immersed in their work seeing off salvinia.



So long salvinia. Doing the mahi.



Wairakei Stream following the salvinia eradication.

Keeping things fresh:

Robin Pieper, Biosecurity Consultant, Boffa Miskell

I've recently joined the Boffa Miskell Biosecurity Team, after spending some time on a (Covidmodified) OE to Canada. Prior to that, I started my career at BOPRC, working in Land Management. I then shifted south to manage wilding conifers in Central Otago. I've now landed back in Christchurch (where I studied) and have been loving getting out and about, and focusing on the weeds and wilding programmes here at Boffa Miskell.

From the braided rivers in Canterbury to the slopes of Mid Dome in Southland, it's a great job! I feel very lucky that my work has great balance of type one and type two fun. Contributing to restoring our environment through managing weeds and pests means a healthy amount of fieldwork, and also plenty of time in the Christchurch office with the team of biosecurity consultants who share ideas and strategies for more effective management. Every day and every project is different, and the seasonality of biosecurity work keeps things fresh. Variety is the spice of life.

I started in biosecurity hoping to protect New Zealand's biodiversity and natural heritage. While that hasn't changed, the biggest thing I've learnt is that biosecurity is actually about the people. A lot of my day-to-day enjoyment comes from interacting with contractors, coworkers, community groups, and stakeholders. I like that our projects bring people together to work towards the same visions and outcomes. It's been really cool to see the progress and difference that we've made for biosecurity at the landscape scale as a nation. I am motivated by the shared ambition to keep taking on bigger and more complex challenges.



Boffer Miskell's Robin Pieper.



Waterweed Problems And Management In New Zealand

Presented by:- Brian T. Coffey (Scientist Aquatic Weeds) D. Ross Thompson (Technician) Ruakura Agricultural Res. Centre Private Bag Hamilton.

Introduction: The 1973 Report of the Committee on Noxious Weeds Administration referred to the aquatic weed problem in New Zealand as a "no-man's land" with occasional unco-ordinated forays undertaken by Government, universities, or commercial organisations as renewed interest or public pressure required. An attempt was made to rationalise this situation as early as 1964 with the establishment of the Lakeweed Officials Committee. Since 1970, this was replaced by or was widened into an Officials Committee on Eutrophication. It comprises representatives of government departments, universities, and local bodies, and is charged with assembling the facts relating to natural and human-induced nutrient enrichment, and recommending the steps and organisations which should elucidate the issues involved. Whilst it has an advisory and co-ordinating role in the general area of aquatic weed research, the Officials Committee has no resources of its own to carry out such work, nor can it direct particular projects to any specific organisation. It is not responsible for the control or eradication of aquatic weeds and unfortunately not all aquatic weed problems are causally associated with eutrophication. Hence we are left with the situation where no government or local body organisation is responsible or equipped for taking action on a national or regional scale. The Officials Committee on Eutrophication must however be credited with focusing attention on the existence of a national aquatic weed problem, and this has contributed to the establishment of an aquatic weed research group of which we are a part, in the Agricultural Research Division of the Ministry of Agriculture and Fisheries. It is further a reflection of it's efforts that the freshwater team in the Fisheries Research Division of the Ministry is being strengthened, and that the freshwater ecology group of the Department of Scientific and Industrial Research is being built up. As Noxious Weeds Inspectors you clearly have a significant role to play in this field particulary with regard to containing the spread of troublesome weeds, and we welcome the opportunity to address you on this basis.

The biological control of weeds by grass carp is at a critical point. Fish have been used in drain trials and they are in a few areas such as the Waihi water supply reservoirs as control agents. Here again however we do not have national authority to impose the most suitable control in a particular area. Local bodies or parochial interests have the assumed authority to choose their own solutions. The only large scale programme of habitat manipulation in progress at present is lake lowering by NZED (NZ Electricity Department) although we have made detailed recommendations for preventive weed management in NZEDs new Hydroelectric projects. The



other habitat manipulation method we are studying at present relates to the Waikato Hydroelectric lakes. Egeria densa is not as prone to dislodgement as others such as Coatophyllum, hence is an acceptable ecological control agent from NZED's point of view. It is however a considerable recreational/ aesthetic nuisance in local areas and we are presently resolving the technique of bottom lining to maintain weed free conditions in these local environs. We suggest that the most sensible attitude one can adopt with regard to waterplant management at present is that one cannot have a weed problem without a weed. Hence every effort should be made to contain the spread of adventive species in this country, and where new, potentially troublesome infestations are identified at an early stage, a co-ordinated eradication policy, and a preventive weed management policy should be adopted.

CONFERENCE PROCEEDING OF THE NOXIOUS WEEDS INSPECTORS' INSTITUTE HELD AT HAMILTON FROM TUESDAY, 27th TO THURSDAY, 29th APRIL, 1976



Find us on the web at www.biosecurity.org.nz

The Tail



Wine: It's gorse of course

While most would look upon gorse as an undesirable plant to have around, it would appear that some early citizens can look back and recall the time when *Ulex europaeus* did have its good points, such as the making of gorse wine.

Gorse flowers were collected when in full bloom and put into a big pot.

Sugar was added and left for about 6 months. After this time the brew had fermented into gorse wine, said to be so powerful that it cured anything."

Protect Number 7, August 1978