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Protect

Winter 2011

Magazine of the New Zealand Biosecurity Institute

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Editor's Note

Welcome to the second issue for 2011. Its déjà vu for me. Just as I was preparing my first issue I was interrupted by major aftershocks. Again the aftershocks have reminded us about who is really running the planet.

People living and working around Christchurch are showing their resilience and the work of Institute members here continues as normally as is possible albeit from different working spaces. I know that Environment Canterbury staff are getting used to working in separate pods around the city, chiefly at Lincoln. The Department of Conservation also, is split between at least three sites. I am sure it will take a bit of getting used to, instead of being in one location. Meantime ECan and DOC's valuable work continues as does the work of all the other greater Christchurch organisations involved in biosecurity.

Almost as sad as losing the Rugby World Cup was the Canterbury Branch's decision not to host NETS next year. It was a wise decision given the bumpy time we are still having with no end in sight.

I am looking forward to NETS this month. I am particularly looking forward to meeting some of the people I have been receiving contributions from and those who have been featuring in the stories. It will be good to report on the gathering first hand and get a few photos to include in the next issue.

Contributions to *Protect* magazine are always welcome at any time.

I look forward to seeing many of you soon.

Best wishes
Chris Macann
Editor

New Zealand **Biosecurity** Institute

The New Zealand Biosecurity Institute can be found on the web at **www.biosecurity.org.nz**

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NZBI news

News from the Executive

Kia ora and greetings from the Executive.

July is Biosecurity Month

Get ready for a month of biosecurity-related stories plastering the media.

Biosecurity is vital for New Zealand – so let's encourage people to know more and be involved. Vice-President Pedro Jensen is again co-ordinating the NZBI Biosecurity Month activities. As we did last year we will aim to co-ordinate and highlight biosecurity stories from around the country. Contact Pedro Jensen (Pedro.Jensen@gw.govt.nz) for the NZBI Biosecurity Month email banner you can use in your emails. The design element can also be used as a temporary linked widget from your organisation's website to our website.

Archive project

The project to establish an archive collection of the various histories of the NZBI has begun. Ray Clarey (Greater Welington Regional Council) and Dave Galloway (Auckland Regional Council) along with others have been digitally recording events and historical information which can be combined into a collective archive store for safe keeping. It is the intention of the project to use our archives, both the living and the digital, to weave a story of the Institute able to be presented on DVD or held on the web. An external professional recommended to the group is scoping out a brief and this will be presented to the members at the AGM.

NPCA coming to NETS?

Have your say on this proposal at the AGM. Members from the NPCA (National Pest Control Agencies) and NZBI have commented about the need for two large annual biosecurity-related seminars. Executive representatives from both organisations have met and discussed issues and scenarios such an alignment would encounter. Both organisations see mutual benefits in working together to provide an aligned seminar that would function as New Zealand's one and only biosecurity-focused best practice annual event.

Rural Delivery

Hopefully you were able to catch the early morning TV slot *Rural Delivery* which screened on May 21. If not, the show is on the web at TV on Demand. It was a great opportunity to have the Institute and biosecurity issues in general aired on such a popular and high-rating show. The interest *Rural Delivery* has shown in biosecurity and the NZBI is testament to the persistence of people such as Ben Minehan and the organising committee's strategic decision to invite Kirsty Cooper, Executive Producer of *Rural Delivery*, to NETS2010. I know there is huge scope to expand the "air-time" of biosecurity through this and other channels as there are many newsworthy topics and inspiring people protecting their patch of the country.

New members

It is with great pleasure that we welcome the following new members:

Alison David
Chris Monk
Meg Gaddum
Kate James
Bruno Danner
Bruce Brewer
David Halliday
Eric Dodd
Louise Vicars
Linda Swift
Vicki Sergeant
Thomas Etherington
Geoff Thorpe
Matt Baber
Malcolm Harrison
Mark Mitchell
Andrea Rule
Alice McNatty
Haley McCoskery
Darren Lees
James Graham
Henri Heyns
Phil Bell
Glen Candy
Kirsty Cooper
Don Eggleston
Penny Fairbrother
Rowan Galloway
Sean Gardner
John Gilchrist
Peter Hamill
Don Hammond
Darrell Haworth
Philip Hulme
Susie James
Colin Jeffrey
James Kilgour
Kerry Matthews
Darryl McGinn
Bruce Pope
Philip Royle
Robbie Sicely
Brent Smith
Sam Thompson
James Thomson
Kristina Townsend
Dave Walford
Jonathan Walter
Peter John Wilkins

All the best

Craig Davey
President
Craig.Davey@horizons.govt.nz

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NZBI news from the branches

Top of the South

Sixteen NZBI members and three potential members from the Top of the South attended our April meeting which included our 2011 AGM. Lindsay Vaughan and Ben Minehan were re-elected as Chair and Secretary respectively. Lindsay thanked the Marlborough team who, along with Carolyn Lewis, were responsible for organising the very successful NETS 2010. A number of suggestions were made for ways of spending the local share of the NETS surplus in ways that would benefit biosecurity. Three presentations followed the AGM.

Nick Hancock (AHB) described the rationale for the eradication of Bovine TB. As the primary hosts are possums, they need to bring possum numbers down to very low densities to prevent inter-generational transfer. Eradication may require some control of minor vectors such as ferrets. This has been achieved on a number of sites (e.g. Bank Peninsula), but the funding agencies have asked for proof of concept on a much larger scale in heavily forested hill country. The AHB is focusing on two trial sites – the Hokonui Ranges in Southland (8000 ha) and the Hauhungaroa Ranges in the central North Island (82,000 ha). Nick said the re-introduction of Bovine TB from infected domestic stock to feral animals can be managed through the existing movement control procedures that are in place and it is not considered necessary to stop the movement of "live" sales from movement control areas.

Bruce Hammond (Mosquito Control Services) described the procedures used for the successful eradication of the southern saltmarsh mosquito and for the ongoing surveillance campaign. It was first identified in 1998 in Napier and has subsequently appeared at nine other sites around NZ. The main tool in eradication is the use of growth regulators to stop the development of larvae into adults. Eggs can be laid on vegetation or in the mud and the eggs hatch once the water level rises sufficiently. On dry sites like the Vernon Lagoons in Marlborough, this can take several months.

Carolyn Lewis (Weedbusters) provided an overview of the development of Weedbusters in New Zealand, described some of the changes that have occurred in public attitudes, and outlined the challenges involved with trying to spread the workload. This followed on from a meeting held on the previous afternoon with community groups and agencies.

Dave Newton (Nelmac) and Martin Cleland hosted the fieldtrip to the Grampians, a steep (392m) hillside in central Nelson containing popular walking tracks with urban development on its lower slopes. It is a mosiaic of different vegetation types that reflect changing public attitudes towards land use on council land. It has stands of pines, poplars and blackwood, and areas of grassland, woody weeds and aggressive vines, with wilding trees scattered throughout. The pine plantations are in the process of being converted to ornamental trees and the challenge is finding cost-effective methods of weed management where conventional methods of aerial spraying and mechanical control cannot be used. The most effective method to date has involved oversowing

Poplars with a mixed understorey have replaced pine plantations on the western side of the Grampians.

Dense vine-covered slopes with scattered wildings on recently acquired land on the eastern side of the Grampians pose challenges for future management. Is fencing and grazing the best method of weed control where houses below restrict the aerial use of herbicides?

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with grass seed and fertiliser and fencing off areas, using sheep to control regrowth until the weed seed bank and the root reserves are exhausted. Timing of operations is critical and any scattered woody weeds that pop up will need to be controlled with hand spraying. This approach is used whenever they are dealing with heavy weed infestations and particularly on weedy sites where natives will be planted. The advantages include having plants that are more easily managed and some degree of nitrogen fixing. Dave believes that it is an under-utilised method of vegetation control.

Martin Cleland (left) and Dave Newton (right) describing the conversion of pine plantation to grazed cutover on the Grampians prior to planting with native species.

Restoration on Christchurch's Port Hills

A restoration project between Whitewash Head and Godley Head on Christchurch's Port Hills has suffered a few setbacks as a result of the earthquakes and a fire. However, the project continues and will be a success, said project leader Keith Briden (DOC).

The Canterbury Branch has taken an interest in this project and helps with weeding and planting.

"The good news is we have had a good summer and good rain in March. The trees are looking great."

He said two slips along the cliff edge resulted in the loss of about 20 plants.

"Plants near cliff edges are closed to access so we can't weed these at present. I don't think this is a big problem as plants are reasonably well established. Plants further from cliff edges on easy access we planted last year are safe to work on but closed to public access for now."

He said the programme may be slowed down this year because people are going to be busy cleaning their own houses and backyards, and travelling across town to do volunteer work is considerably more difficult, and the group cannot work on several sites.

The bad news is that a Taylors Mistake bach-dweller, in a closed fire season, and with water supplies cut, lit a rubbish fire and placed the ashes at the base of the hill near long dry grass.

"We lost about 800 to 1200 trees that were two years old and looking well-established."

A further 200 plants ended up in the ocean following the June 13 aftershocks.

Keith said a planting day is planned for the weekend of July 16-17.

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NZBI news from the branches

Lower North Island

Welcome to "Welliwood". Well, another year done and another AGM is upon us! It seems like only yesterday that we were admiring the view of the mighty mountain from the café in Ohakune.

This year we went to Wellington – absolutely positively, well Wainuiomata to be precise. We headed over the hill and up into the beautiful Wainuiomata Orongorongo catchment. The two valleys that make up this catchment were set aside for water supply purposes by Wellington's founding fathers. This meant that much of the catchment has never been logged and now is home to many impressive podocarp specimens, a variety of mistletoes, orchids and some of the best beech forest in the region. There is even a small population of North Island brown kiwis.

Two excellent speakers opened the seminar; Barbara Hayden from NIWA and Philippa Crisp representing the Local Government Biodiversity Forum. Barbara Hayden spoke to us on current and future issues arising in the marine environment. We learned that the problems marine pests pose are many, varied and difficult to manage. Marine biosecurity is possibly not as high on the radar as it should be for many of us. This talk provided a fantastic opportunity to see some of the threats facing our marine biodiversity and expand our knowledge of the issues. Philippa Crisp spoke about the new regional council biodiversity forum driven by Local Government New Zealand. The forum is made up primarily of senior staff members or representatives from each regional council around the country. DOC, territorial authorities and crown research institutes such as Landcare Research are also represented. The purpose of the forum is to determine how to co-ordinate biodiversity information so it can be managed, manipulated and reported on at a national level. The first task was to establish a framework for ecological measures and assessments that can form the basis of governance. The next task was to set up steering or working groups to formulate the ecological indicators that regional councils can report on, and apply for Envirolink Tools funding so that Landcare Research can develop a biodiversity monitoring system for regional councils. The last task was to pinpoint regional councils' monitoring requirements.

Wainuiomata Mainland Island

Photos: Elaine Iddon & Ewan Kelsall

Rata in full glory.

Alistair Forsyth gave us a tour of the water treatment facility. Many of us have worked in the water treatment area controlling pests ensuring a clean water supply, so it was very interesting to see the next stage in the process before the water is sent down the pipes. There is also a park ranger living on site at Wainuiomata. He is woken by birdsong and has to live on a lakeshore surrounded by trees, poor thing! We were lucky enough to have Grant (the park ranger) come and give us some history of the park. Part of the water collection area is designated a mainland island. This area has been partially fenced and is intensively managed for pests

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NZBI news from the branches

and heavily monitored. Kim Broad, Greater Wellington Parks Restoration Advisor, described the management programme and took us on a drive into the catchment to see the results. We were rewarded with views of some impressive rimu specimens and flowering ratas dripping from trees everywhere you looked.

We were not very lucky with the weather on day two and travelled in convoy around a wet, wild, desolate yet stunningly beautiful south coast. We came across an unfortunately deceased strap-toothed whale on the way. At our last AGM we decided to lend practical or financial assistance to a community project. This year we assisted MIRO (Mainland Island Restoration Operation), the East Harbour Regional Park care group, to release some plantings in the lakes block of the park. The lakes block is a nationally significant wetland with important native fish and bird inhabitants. We were proud to help with this important work and thank the volunteers from MIRO who braved the rain to assist and guide us. Those who did not assist releasing plants walked around the lakes on a flora and fauna observation tour. A small group of us went on a lizard fossick and despite the inclement weather we found three common gecko!

Stranded strap-toothed whale on the south coast.

Sara Moylan

Central North Island

The Central and Lower North Island branches (Waikato/Hawke's Bay) are joining forces to organise the 2012NETS conference, which will be held in Taupō. A conference committee has been formed, so watch this space!

The NPPA review was also on the agenda for discussion. This review is the first review for five years and the last chance for another five years before the list will be looked at again. Waikato Regional Council and Weedbusters have put up quite a long list of plants to fill a few gaps and prevent these plants from being spread via the sales pathway. Also this banned-from-sale list will help provide a "back stop" for some weedy species and provide excellent education opportunities with the public about weedy plants. Thanks to Carolyn Lewis and others for helping out with this.

Alby Osbourne discussed and demonstrated the benefits of using shade cloth mats when hand laying Pindone for rabbits in high public use areas. This is an amazing tool which will have a huge benefit for rabbit control on coastal fore dunes, and lifestyle blocks where there is a perceived risk to non-target species or the landowner has concerns about toxin use.

Steve Ellis explained that he is working on a project for the Biosecurity Managers Group looking at training available in biosecurity. He outlined the identified training and asked members what training they believe is necessary for their role. Discussions followed regarding the need for various training including, dealing with difficult people, plant and animal pest specific knowledge, communication skills, biocontrol use and aquatic pests. Thanks Steve for this discussion and we look forward to what happens next.

The Central Branch is looking at a busy year ahead as we organise the 2012NETS conference in Taupō as well as looking forward to the NETS2011 conference in Auckland.

Darion Embling
Executive Member
Central Branch

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NZBI news

Biosecurity personnel profile: Ronny Groenteman

Role: Weed Biocontrol Team
Landcare Research
groentemanr@landcareresearch.co.nz

I came to New Zealand from Israel, at the end of 2004, to do a PhD on biological control of nodding thistle at Canterbury University. I have been fortunate that my project involved scientists from Agresearch and Landcare Research, and even more fortunate to later become part of the weed biocontrol team at Landcare Research.

My current main project is focused on aspects of the successful past biocontrol programme against St John's wort. This is an exciting opportunity to compare current, modern weed biocontrol risk assessment procedures, to what was acceptable at the time the programme ran in the 1940s. Examination of the successful biocontrol agents, leaf-feeding beetles, showed that in the laboratory they feed and complete development on indigenous plant species closely related to St John's wort. Under current regulations we would not have introduced them to New Zealand to avoid risking non-target damage to the indigenous species. However, it is difficult to find field evidence of such non-target effects even after many decades of the biocontrol agent's activity.

The great challenge now is to make inferences for future programmes and find methods to identify false effects of biocontrol candidates feeding on non-target hosts in the laboratory in quarantine. Identifying false effects is important if we want to make sure we don't risk rejecting agents with great potential to be both safe and effective.

I enjoy being part of a team of amazing scientists and practitioners, and find it rewarding to be involved in work that makes a meaningful positive difference to the New Zealand environment.

Ronny Groenteman with her husband, Raviv, on Cascade Saddle, Mt Aspiring National Park.

In my spare time, I mostly enjoy tramping, so being based in Christchurch is quite handy – not too far from any South Island national parks.

Ronny Groenteman

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Weedbusters update

Weedbusters make friends in high places

It's been seven years since Weedbusters was launched in New Zealand, and it has certainly made a positive impact in that time, most notably in fostering public involvement in tackling weed issues, and in encouraging an interagency approach to weeds-awareness efforts.

At the annual two-day regional co-ordinators' workshop held recently in Wellington, Woody Weed, the Weedbusters mascot, was given an important mission: to embark on a country-wide roadtrip to make contact with key folk in organisations involved in weeds issues, get a photo of them with Woody and give them an opportunity to make a statement reconfirming their support for the work Weedbusters is doing.

So far Woody has been seen out and about hobnobbing with regional council folk at the National Agricultural Fieldays in the Waikato. He's also had photo shoots with Horizons Regional Council's CEO and chairman. Next stop on the roadtrip is Wellington, where he has gigs booked with a variety of notables at both Greater Wellington Regional Council, DOC, and Wellington City Council. Then he zips back up to Auckland to rub shoulders with folk in the "Super City" and further north.

After that? Well, Woody will go wherever he is invited, really. I have the happy job of organising his itinerary, and I can be contacted on info@weedbusters.org.nz. No doubt if Woody feels a hankering to head to your neck of the woods and an invitation isn't forthcoming, you'll be hearing from me!

Carolyn Lewis
National Weedbusters Coordinator

Jason Roxburgh, DOC Manawatu Rangitikei Area Manager, with Woody Weed.

"Woody Weed is part of the team here in the DOC Manawatu Rangitikei Area Office. Weed control makes up a big part of our work so it is great to have an initiative like Weedbusters to help reach out to people and get communities involved in the battle against weeds. Weedbusting is a common theme at Manawatu-Rangitikei community events, so most of our staff are very well acquainted with Woody."

– Jason Roxburgh, DOC Manawatu Rangitikei

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Commitment rewarded

Biosecurity advocate recognised in Queen's Birthday honours list

The NZBI would like to congratulate John Hellstrom, for his well-deserved Queen's Birthday honour. John has been honoured as an Officer of the New Zealand Order of Merit, for services to biosecurity.

He founded biosecurity in New Zealand, developed new systems for protecting native plants and agriculture from pests and disease, and established new standards for animal welfare, but John's proudest moment was getting a native parrot on the cover of the biosecurity strategy booklet.

"I was so surprised. I'm also very proud, because it's good to see biosecurity recognised in such a way."

He was still proud of the native parrot scoop.

"There were a lot of arguments about how it should be a cow or some type of farm animal, but I managed to get a kakapo as our mascot. It was about getting people to think [biosecurity] is much more than just protecting the farming industry. It's about protecting the whole country.

"You only need to look in the eyes of a kakapo [to see why I chose it]. They're so endangered and it's a strong symbol of what we have to lose and what we've already lost."

John has held several high-profile positions in the past 25 years, including chief veterinary officer for the Ministry of Agriculture and Fisheries from 1986 to 1991 and chairman of the Biosecurity Council from 1997 until 2004, when it disbanded.

He is now chairman of the National Animal Welfare Advisory Committee.

The path to a career in biosecurity developed from an interest in animal disease control and from living in Endeavour Inlet, John said.

"It was a logical progression to stop disease getting into native species. I love animals, but I'm much more passionate about New Zealand's total biology. Unique species are what turns me on most days."

Dr John Hellstrom

One of his first jobs was to pull different agricultural security systems together into one overall security system to survey and respond to threats. The system later incorporated New Zealand native species and became the New Zealand Biosecurity Strategy.

John acknowledged fellow Marlburian Royce Elliott who came up with the idea to create one agricultural security system.

"Without him, it would have been very hard for me to do from the beginning," he said.

His current job has proven the most challenging, because he has to deal with strong and varied opinions on animal welfare from interest groups.

John hopes the Animal Welfare Act will be strengthened and improved while he is still in the job.

- The Marlborough Express

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Climate change impacts

Interaction between climate change and invasive species' impacts on alpine ecosystems in New Zealand to be studied

Andrea Byrom & **Jenny Christie**
Landcare Research DOC

As part of Landcare Research's Invasive Mammal Impacts Programme, a group of Department of Conservation and Landcare Research scientists (Jenny Christie, Warren Chinn, Roger Pech, Mike Perry, Elaine Murphy, Derek Brown and Andrea Byrom) have begun a new project to find how invasive species' impacts on native biodiversity can be exacerbated by the effects of climate change.

Our model system examines the interaction between climate change and predation impacts using incursions of ship rats (*Rattus rattus*) into alpine areas. Ship rats have been recorded only occasionally in alpine ecosystems, possibly spill-over from outbreaks during years of high seed and fruit production in forest and sub-alpine vegetation. However, as an invasive predator, ship rats could have major impacts on groups of native alpine biota such as weta (an iconic invertebrate), other invertebrates, lizards, and birds such as rock wren, in alpine areas. Climate change models predict more years in which mean summer temperatures climb above the putative threshold that triggers "masting" events in tall tussock (*Chionochloa* spp.) in alpine ecosystems, and beech (*Nothofagus*) forests adjacent to alpine areas. Based on knowledge of invasive species' impacts on native biota, the researchers aim to predict how climate change events such as increased masting frequency might affect long-term trends for native biota.

The team has selected research sites and is working with DOC staff from the Nelson Lakes Area Office, on a mainland island on the St Arnaud Range as well as nearby Robert Ridge. Preliminary surveys of vegetation, invertebrates, and invasive mammals have been completed and we will keep you posted as to how the project develops in the future.

Alpine landscape on the Robert Ridge, Nelson Lakes National Park, where potential climate change effects on rat incursion will be studied by Landcare Research and DOC scientists.

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Control method

Mowing in the rain: a simple technique to control Californian thistle

For years farmers have had anecdotal evidence that mowing pasture in the rain helps to reduce the abundance of Californian thistle (*Cirsium arvense*), which is the most destructive pastoral weed in New Zealand.

Now research has provided quantitative evidence to show that mowing in the rain really works, as well as uncovering a potential biological basis for the effect. This work which is the latest product of 20 years collaborative research on weed control methods by a team of scientists from the Crown Research Institutes AgResearch and Landcare Research, the Bio-Protection Research Centre, industry organisations and community groups featured at the AgResearch exhibit at the recent National Agricultural Fieldays at Mystery Creek.

Project leader Dr Graeme Bourdôt, Senior Scientist at AgResearch Lincoln, said the finding emerged from a national survey of diseases found on Californian thistle, funded by Meat and Wool NZ (now Beef + Lamb NZ). The team collected samples from hundreds of farms throughout New Zealand and found several pathogens of particular interest.

One of these, the vascular wilt fungus *Verticillium dahliae*, a pathogen that causes diseases in many crops, was common on the thistle in this survey. The fungus produces spores inside the thistle that are released by mowing, dispersed by splashing rain and then gain entry into other thistle plants through wounds.

The team thought that the spread of the fungus by splashing rain and wet mower blades could be the explanation for the mowing in the rain phenomenon.

To investigate, Beef + Lamb NZ funded an experiment on 12 farms throughout New Zealand over two years. The experiment showed that mowing in the rain produced a 30% reduction in the ground cover of thistle in the spring compared to mowing in dry conditions.

The team also sampled for the wilt fungus, but found no correlation between its abundance and the mowing effect. It may be that more samples are needed to show the effect, or it is possible that a combination of pathogens contributes to the effect, or even that it is caused by a different pathogen altogether.

Graeme Bourdôt inspects a patch of Californian thistle.

For now, the biological basis of the mowing in the rain effect remains unproven. However, the research does show conclusively that mowing in the rain works to reduce Californian thistle abundance. As Dr Bourdôt said: “It’s a simple technique that farmers can use right now at little cost.”

The team’s next step is to apply the fungus to some plots and not to others, and then mow the paddocks in the rain and in the dry. If the fungus is found to be the reason behind the mowing in the rain effect, it could potentially be formulated and marketed as a biological herbicide that farmers could apply when they mow paddocks in the rain to increase the effect.

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Systematic decision-making

Decision support system for vertebrate control goes online

Dave Morgan, Bruce Warburton, Margaret Anderson & Mike Cochrane
Landcare Research, Lincoln

Deciding how to control vertebrate pests has become increasingly complex over the last 20 years due to new knowledge of pest impacts and control, an increase in the range of products available for pest control, new legislative requirements for pest control agencies, increased public interest in the impacts and control of pests, diversification of the pest control "industry", and reorganisation of the roles of some of the key participants (Fig. 1).

In particular, under the Resource Management Act and the NZ Biodiversity Strategy, local authorities have been faced with new responsibilities for pest management on private land. This may often entail collaboration with community-based conservation groups towards shared conservation goals. As funds are always limited, decisions have to be made about which assets to manage and how to do this, and this usually involves pest control. Local authorities currently spend approximately $40 million annually to manage plant and animal pest populations, and have recognised the need for a decision support system (DSS) to improve the transfer of information from researchers to pest managers, to help ensure that the most appropriate control methods are rationally and transparently selected. Such a system should be of value to a diverse range of users, as indicated by the diverse range of stakeholders (Fig. 1), including conservation groups seeking practical information to support their pest control activities.

To address this need, we have designed and constructed a web-based DSS, initially focused on improving the control of possums, rats, stoats, ferrets, and feral cats. The logic of the system was designed by identifying the "generic" questions that apply when pest managers are considering the most appropriate choice of control method, and using "yes/no" responses to determine the decision paths followed. Such an approach is intuitively easy to understand, and unambiguous. The questions are focused on the key issues of operational aims, land tenure, farming practice, public and environmental safety, community views and involvement, and landowner views. Consideration of these potential constraints in a logical and systematic way results in a series of recommended options being presented that are then narrowed down by establishing what control methods may have been used previously (as frequently repeated use of most methods results in declining effectiveness), and basing final recommendations on the likely cost of the remaining suggested methods. All recommendations are linked to best-practice advice that is based largely on Department of Conservation documents, and supplemented by practical guidelines for trapping pest animals published by the National Possum Control Agencies (NPCA). Best-practice advice is, in most cases, well supported by New Zealand-based research findings for which references are given.

The system simulates the decision-making process that an experienced, well-informed pest manager would typically follow. However, we stress that the tool is designed to support, not replace, decision-making by pest managers. This is because there is always the possibility that the DSS may not consider every operational constraint that applies to a particular pest control operation in a particular locality.

To assist in prioritising proposed operations, the DSS also contains a calculation of "efficiency" (E), as developed and used by the Department of Conservation:

$$E = (W \times B \times S)/C,$$

where W is a weighting based on the relative value

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Systematic decision-making

of the biodiversity asset (e.g. a species, population, ecosystem, or locality to be protected) using concepts such as species taxonomic distinctiveness; B is the benefit expected from the management action and can, for example, be expressed as the increase in probability of the asset being secure as a result of the action; S is a measure of the probability of control success; and C is the cost of the action, and a costing tool has been included. Pest managers will therefore have a means of rationally selecting actions with the highest efficiency rankings to get the "best bangs for bucks" from limited budgets.

It is expected that new information from research, field practice and manufacturers will be incorporated on an ongoing basis.

In summary, the DSS will:

- Identify the most appropriate control options in response to proposed operational details and constraints
- Provide transparency/accountability in decision-making by producing a hard-copy summary of the DSS input and output
- Enable prioritisation of pest control operations alongside other biodiversity "actions" such as fencing or revegetation
- Provide for a consistent approach nationwide among pest managers considering all the key constraints when selecting pest control methods
- Present "best current practice" for all control methods to maximise effectiveness and minimise risks

The DSS is available at: http://pestdss.landcareresearch.co.nz/.

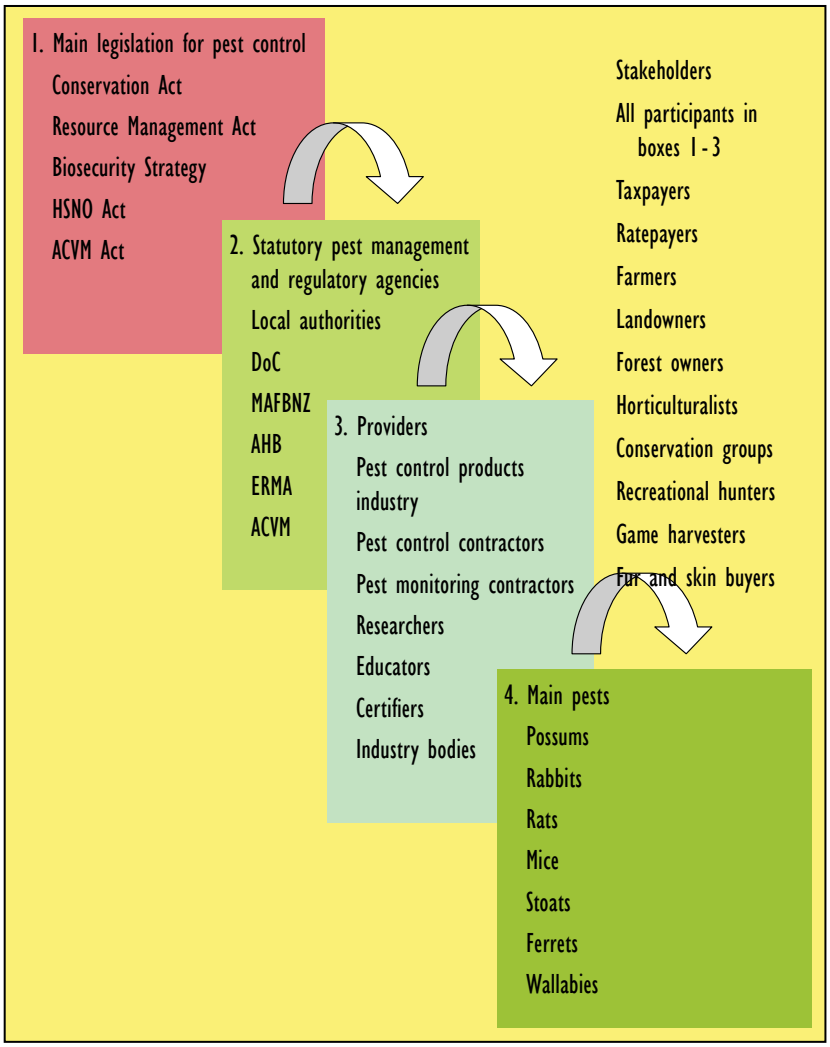

Fig. 1. A broad summary of the vertebrate pest control sector in New Zealand. Arrows indicate a chain of action from legislative requirements through to targeting of particular pest species. Stakeholders may have involvement and interests in multiple parts of the sector.

Acknowledgements: This work was funded by an Envirolink "Tools" grant from the Foundation for Research, Science and Technology. The Department of Conservation and National Possum Control Agencies are gratefully acknowledged for generously contributing information to this development.

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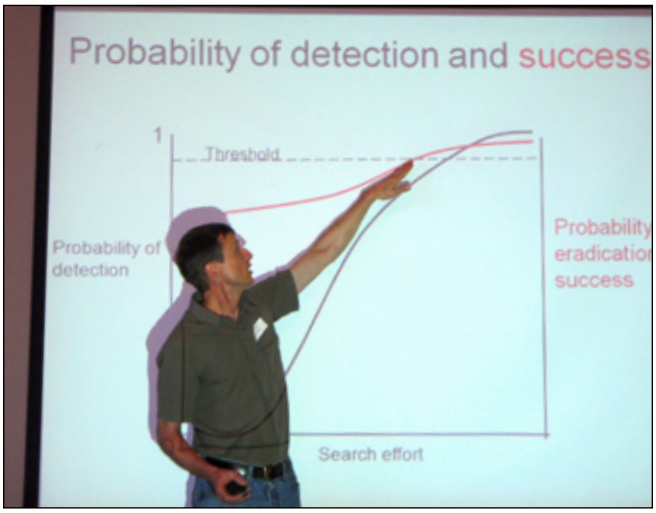
Outreach programme

Bonanza helps broadcast biosecurity information to wide audience

Lynley Hayes
Landcare Research, Lincoln

The Biosecurity Bonanza was held for the first time in Christchurch last year, as an initiative to make our science more accessible to our stakeholders and encourage more dialogue with them.

This year Auckland was the venue for this free one-day workshop which highlighted research from four MSI programmes: Beating Environmental Weeds, Invasive Mammal Impacts on Biodiversity, Control of Small Mammal Pests, and TB and Suppression Systems.



Dean Anderson describes how to determine if a pest eradication programme has been successful.
Lynley Hayes, Landcare Research

After brief overviews of each programme, the nearly 100 attendees from 25 organisations could choose between concurrent sessions on weed and animal pest management. In addition to Landcare Research staff the weeds session also included presenters from AgResearch, NIWA and Scion. This session also branched out this time to include diseases (kauri collar rot) and dung beetles, as well as weeds. The weeds presentations included research into weed problems (e.g. dealing with aquatic invaders and studies to underpin eradication

strategies), biocontrol solutions (e.g. buddleia leaf weevil, heather beetle and tradescantia leaf beetle), and research to ensure potentially useful biocontrol agents are not rejected unnecessarily through molecular studies of, and more sophisticated testing methods for, potential non-target plants. This was matched by presentations from the invasive animals team on topics ranging from disease (TB in wildlife), poisons (public perceptions, environmental risks, and best practice) and traps (multi- vs. single-capture), to control strategies and pest ecology and impacts.

There was good audience participation, particularly on contentious issues like the risks posed by anticoagulant residues in the environment and the balance between public perceptions and evidence-based decisions for pest control. Success stories included Paul Peterson's description of the release of heather beetles in Tongariro National Park and Dean Anderson's explanation of how repeatedly finding no evidence of pest animals can provide quantitative information for assessing whether an island pest eradication programme has been successful.

At the end of the day, five mini-workshops were held to discuss prioritising weed targets for biocontrol, what it takes to translate weeds research into action on the ground, progress on strategic application of baits and toxins (new technologies), GIS "show and tell" of GPS collar data from deer, cattle, pigs, and possums, and landscape-scale pest control – managing sites to achieve connectivity.

The day ran smoothly thanks to Andrea Airey's careful planning, with assistance from Hugh Gourlay. Feedback forms again were extremely positive about the event and the general consensus was that this workshop is an excellent way to showcase our research to people who are interested in weed and pest management. Next year we plan to hold the Biosecurity Bonanza in June in Wellington.

Bonanza talks are available at:
www.landcareresearch.co.nz/news/conferences/biosecuritybonanza/presentations_11.asp

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Aquatic pest plant control

Hydrilla on the road to eradication but freshwater biosecurity at risk?

John Clayton & Paul Champion
NIWA, Hamilton

What does it take to find a biosecurity solution?

In the 1950s a new aquarium plant, Indian star vine was introduced into the USA from Sri Lanka. Within 10 years it was recognised as hydrilla and it soon became a major aquatic weed in Florida, occupying 150,000ha of lakes and waterways. Control efforts to date have cost in excess of US$225 million to protect irrigation and flood control schemes.

What does this have to do with New Zealand and NIWA? Well, about the same time, the same species was first recorded in New Zealand. Fortunately it was found in an isolated lake in Hawke's Bay. Based on its history in the USA, a control programme in New Zealand was advocated. Unfortunately some management agencies questioned the need for this approach, even suggesting that the New Zealand hydrilla was not invasive, and it was evident there were few if any available control methods.

NIWA solutions included competition experiments growing hydrilla with all the other submerged weeds known here, along with native species in secure contained facilities. As predicted, hydrilla was the most invasive species. A NIWA aquatic weed risk assessment model was developed specifically for aquatic weeds, using weed characteristics, impacts, potential methods of spread and resistance to control methods. This method is now adopted as a decision-support tool not only in New Zealand, but also Australia, USA and Micronesia in the North Pacific. Our advocacy led to hydrilla (along with several other invasive weed species) being banned from sale, thereby preventing deliberate spread of this plant through the aquarium trade.

Hydrilla: Top, a weed bed before control, and bottom, after, with grass carp. Photos: Rohan Wells, NIWA

The NZ strain of hydrilla not only proved to be highly invasive, but also incredibly difficult to control. The only herbicide registered for aquatic use in New Zealand – diquat – failed to even check its growth, with similar results obtained using the herbicide of choice in the US, a product known as fluridone. An extensive screening of available products, first in small-scale containment and subsequently in field trials led to the identification of endothall as a safe and effective herbicide that could help control large weed beds of hydrilla while leaving no toxic residues behind. As there was a limited commercial market for this product, NIWA co-ordinated an application to the Environmental Risk Management Authority to have endothall registered for use in water. This was funded by a consortium of regional councils, central government agencies and power companies. Endothall was registered in 2005 and is proving to be an important new tool to help win the war on aquatic weeds, including hydrilla.

The New Zealand strain of hydrilla produced tubers (like a very small potato the size of a cashew nut) that could lie dormant in the sediment for more than 10 years. The challenge was to find a solution that could remove every single hydrilla plant sprouting from these tubers in order to prevent new tubers being produced for a period exceeding 10 years! There was only one option available; grass carp (a plant-eating fish – not to be confused with the koi carp, a pest fish

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Aquatic pest plant control

currently infesting the lower Waikato River). Research using these fish to control hydrilla began in 1988 with a field trial in Lake Elands with the help of the private landowner and 400 grass carp. Each year, sediment was dredged and sieved to sample hydrilla tuber numbers and meticulous searches were carried out for shoots among fallen branches and other obstructions. Either tubers or shoots were found for another 12 years after the main weed beds had been removed, but now the lake has been hydrilla free for eight years.

So NIWA had the tools and a management plan, with confidence supported by experimental evidence that the "world's worst submerged waterweed" could be eradicated from New Zealand. MAF Biosecurity New Zealand (MAFBNZ) took responsibility for hydrilla management as part of their National Interest Pest Response Programme (NIPR) and implemented their eradication plan. In 2008, endothall was used to rapidly reduce the biomass of hydrilla in strategic high-use areas, and this was followed by the release of a total of more than 2700 grass carp into the three remaining infested lakes. Just 15 months later, hydrilla has been reduced to a very low level and the risk of spread to new water bodies is negligible.

This solution was only ever possible because there was a research-funding commitment to the freshwater biosecurity team that preceded even the establishment of NIWA in 1992. This knowledge combined with skills in tool development and direct engagement with both regulatory authorities and management agencies (e.g. MAFBNZ), and NIWA expertise provided at a series of meetings with affected lake user-groups and iwi, was instrumental in achieving this successful outcome.

Similar collaboration with national and regional management agencies has resulted in the national eradication of five high-risk aquatic plants and near eradication of a further six including the internationally renowned weeds, water hyacinth and salvinia. At least another dozen species are managed for regional eradication with NIWA research and operational input to these strategies. NIWA is acknowledged as a world leader in providing the technology behind these eradication programmes.

NIWA's commitment to freshwater biosecurity extends to supporting border control initiatives, with the identification of hydrilla in a consignment of aquarium goods intercepted at the International Mail Centre in 2006. This demonstrates that border security is an on-going issue and that New Zealand must never become complacent or drop our guard against new invasive species that threaten our treasured inland waters, their unique biodiversity and the industries they support. There are many further threats (e.g. zebra mussels, crayfish plague and Eurasian watermilfoil) that require a biosecurity readiness and capability.

We ignore the risk of new invaders at our peril. Protecting New Zealand's freshwater environment from invaders requires constant vigilance and on-going research and development investment. However, New Zealand's freshwater biosecurity capacity is threatened by a lack of government funding in this area, with funding for the NIWA programme concluding in September 2010. A paradigm of effective biosecurity is that the status quo remains unchanged. The dilemma is how to prioritise investment in science that doesn't appear to give an immediate return?

The timeline of action taken to control Hydrilla in New Zealand.

Action	Year	Parties involved
Hydrilla positively identified in Lake Tutira	1969	Healy - Botany Division
Hydrilla banned from Sale & Distribution under Noxious Plants Act 1978	1982	MAF Aquatic Plant Group
New hydrilla infestations found in Lakes Opouahi and Eland	1984	MAF Aquatic Plant Group
Grass carp trial proposed for Lake Eland	1986	MAF Aquatic Plant Group
400 grass carp released in Lake Eland	1988	MAF Aquatic Plant Group
Endothall mesocosm trials show control of hydrilla	1993 & 2001	Wells & Clayton; Hofstra & Clayton - NIWA
PhD thesis showing hydrilla is most competitive submerged weed	1997	Hofstra - University of Waikato & NIWA
Endothall field trial in Lake Waikopiro	2001	NIWA
Operational plan for hydrilla containment and eradication research prepared for DOC	2003	Hofstra et al. - NIWA
Endothall registered for aquatic use in New Zealand	2005	ERMA based on NIWA input
Reports to MAFBNZ outlining impacts and control options for hydrilla with aim of national eradication	2006	Hofstra & Champion - NIWA
Identification of hydrilla in intercepted parcel	2006	NIWA
MAFBNZ eradication programme commenced after year of consultation	2008	MAFBNZ, InGear Global, NIWA
Hydrilla reduced below 1% of original biomass and surveillance shows no further spread to new water bodies	2010	NIWA reports funded by MAFBNZ

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Biosecurity briefs

Australian invasive species magazine

Feral Herald is the magazine of the Invasive Species Council of Australia. The June issue of the magazine covers, among many other topics, cattle and weed spread, European and Asian honeybees, feral horses and feral deer. It can be found on the council's website at: www.invasives.org.au

Weed science conference

The 23rd Asian-Pacific Weed Science Society Conference will be held In Cairns, Queensland from September 25-23 this year. The theme is weed management in a changing world.

The conference features presentations on climate change, lack of water, biosecurity, population growth and the use of weeds in the future.

Field trips will be organised to demonstrate weed issues affecting Northern Queensland, Australia and activities undertaken to reduce their impact. These will be selected based on their applicability throughout the Asia Pacific region.

Information is available at: www.apwss2011.com

Ramblings from a 78-year-old

Way back in the late 1940s and early 50s, Templeton and surrounding districts were plagued by thousands of crows or rooks as some people called them, a large black carrion-eating bird.

Farmers would plant crops of grain and peas. With the grain, the crows would come down and eat it as fast as it was drilled into the paddocks. Sometimes 10 or more acres were stripped in one day. With pea crops, they waited till they came up then pulled the green shoots off – a very cunning bird.

My dad tried poison wheat. He had a bucketful on the tractor which he threw out when drilling the paddock but they wouldn't touch it so he put some in the drill and sowed it with the other grain. We got a good kill that time. Different ways were tried to get rid of the birds. One time the council provided shotgun cartridges but to no avail. After the first few shots they flew too high. The birds lived in rookeries all around the district. A big one was at Paparua Prison and another at Templeton Hospital as well as more. In 1951 the Army tried explosives to keep them off their nests, that didn't work so next the council used 1080. They fed the birds on chopped carrots for several days and in the last few days put the poison in and got a 99 per cent kill. The crows cost the farmers a lot of money and time. The birds would also take walnuts, drop them from a height onto the road to break them open. Very cunning!

– Templeton Residents' Association Newsletter (South-west Christchurch)

A tutsan infestation in the Ruapehu area.

Group secures funds

The Tutsan Action Group (TAG) from the Ruapehu region has been successful in securing funds through the Sustainable Farming Fund for research into bio control for tutsan. This project is a world first and if successful will control and also reduce the spread of tutsan regionally and nationally.

Research will include overseas and local surveys of tutsan to determine natural enemies over the next three years, identifying the most promising potential bio agents and recommending a costed programme of work for developing them further.

Thanks to those individuals and organisations who have contributed funds or distribution information to this exciting venture.

TAG will provide regular updates through *Protect*.

– Dave Alker, Horizons Regional Council

Advice for newcomers

Protect asks experienced practioners to share two brief pieces of advice they would give to newcomers to biosecurity.

Errol Barnes is a Darfield-based biosecurity officer for Environment Canterbury:

1. Be open to listening to people: relax, stay calm, and take it in.
2. You're not expected to know everything starting out.

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