

Summer – 2008

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# Protect



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New Zealand  
**Biosecurity** Institute

*Our mission: Working together to ensure New Zealand is protected from the adverse impacts of invasive species*

NZBI thanks Horizons Regional Council for printing and posting the hard copy of *Protect*.



# Protect

Summer 2008

Magazine of the New Zealand Biosecurity Institute

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## Editor's Note

**S**easons greetings *Protect* readers! OK, this time it's true – this is my last issue. Lynne Huggins from DOC Southland takes over the reins next year. Thanks again for everyone's contributions over the past two years. Watch out for Lynne's emails and phone calls in the new year!

Our Summer issue is filled with news and views from around the country. There are links to useful research materials, a summary about the ins and outs of managing Key Native Ecosystems in Greater Wellington and a focus on the ecological impacts of Argentine ants. We celebrate Professor Mick Clout's international award received in recognition of his outstanding contribution to biosecurity and conservation management. Greg Hoskins has kindly provided us with some summer reading



**Clean-up time: Waterblasting Wishbone, top, and ready for relaunching with two coats of anti-fouling.**

Photos: Kirsten Crawford

about an area he visited in France.

I hope everyone has a chance to take a break over Christmas and the New Year to recharge. I have spent the last couple of weekends sanding and anti-fouling our yacht, Wishbone, ready for the annual family sailing jaunt. It was good to see the haul-out services so busy with people cleaning and anti-fouling their boats. I'm looking forward to the "boaties' banter" about island weeds, marine pests and anti-fouling schemes – always of course, washed down with a "warmish" beer and fresh snapper! Take care over the holiday season wherever you are and I look forward to talking with members in the new year.

Best wishes, **Kirsten Crawford**

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New Zealand  
**Biosecurity Institute**

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## NZBI news

# News from the Executive

## Kia ora and seasons greetings from the Executive!

### Executive meetings

The Executive met on November 3 in Christchurch to tie in with the MAFBNZ Summit also taking place there.

### Financials

Our financial situation is looking very healthy and we will end the year with approximately \$60,000. This is obviously quite a substantial amount and one that should see the Institute through any recessionary pressures. A small amount of this money is being used on the website upgrade. The Institute is now GST registered and this should have little impact on members. Given our funding situation we have decided to absorb the cost of GST into our membership fee, though NETS may be marginally more expensive.

### NETS2010

Lyndsay Vaughan, Executive representative and Chairman of the Top of the South branch confirmed that branch's desire to hold NETS2010 in its area. Ben Minehan of MDC will co-ordinate the event. Apparently a venue has already been booked.

### Awards

Given the state of our funds and having received feedback from students, it was decided that the overall pool of funds for the study awards and professional development awards should be increased by \$1500. This is great news for students and those members who would like to undertake study or attend an event that is presently out of reach.

### Professionalising the Institute

A member floated the idea of hiring a part-time Executive Officer who would lobby and formulate submissions on behalf of the Institute. The Executive decided that at least in the short term it would not be a position that we would consider.

There were a couple of reasons for that decision. The changes needed to undertake this function would be substantial, and to some of the Executive, may prevent some members from being involved.

The second reason involves the inclusive nature of the Institute's membership across the entire biosecurity spectrum. We thought that to speak with one voice was actually quite difficult: i.e. which member, or employer would we disenfranchise when we made particular

comment. However, there remains scope for this sort of function within the Institute as many external matters arise that deserve comment. I am positive that we will establish a clearer understanding of how best the Institute can function at this level over time. I believe that discussion on this topic needs to continue, focusing on the strengths of the Institute and what else we can do to give further life to our mission statement and aims. These discussions could be between members, at branches and during NETS.

### Carolyn Lewis resigns

After many years of service to the NZBI, Carolyn has decided to stand down from her role on the Executive as Immediate Past President. Carolyn has been an integral part of the Executive, a driving force of many NZBI initiatives and a fabulous conference organiser! On behalf of the Executive, thank you Carolyn for all the passion and input.

### NETS2009 – Queenstown, October 14-16

The organisers have been busy putting together a programme, sorting field trips and are beginning to approach sponsors. The formal call for papers will be made early next year.

#### New members

We would like to welcome the following new members to the Institute.

#### New Members:

Dean Turner

Amy Lagerstedt

Kirsten Westfall

Bionda Morelissen

#### Trial members from NETS2008:

Brett Bailey

Steven Bosak

Matt Calder

Ben Elliot

Roger MacGibbon

Brian Smith

Corinna Bennett

Tim Brenstrum

Stephen Coe

Rick Lane

Bill Naik

### Subscriptions

Just a reminder that in the new year you will receive your membership subscription invoice. As usual the deadline for subs is March 31. There are two good reasons for paying your subs by this date. Firstly, they are \$10 cheaper than subs paid after March 31, and secondly, you are only eligible for a member's registration fee at NETS2009 if you have paid by that date.

**NZBI News from the Executive** Continued

If you know of people intending to join for the first time, then attending a NETS conference allows them to join as a trial member, receiving 18 months free membership.

It would also be good if members could keep us up to date with their current details, in particular, when members change jobs – please let us know if you are resigning or have new contact details. Our treasurer spends a lot of time chasing lost members and rejected email addresses which can be frustrating as well as time consuming.

**New Editor**

Yes, this is the last issue with our present Editor. I would like to pass on many thanks to Kirsten Crawford. *Protect* does not create itself and without Kirsten's

enthusiasm and energy at hunting out stories and hunting down people to tell stories, the magazine would not be what it is.

Lynne Huggins from DOC in Invercargill has put her hand up and will craft the March issue. So if you know Lynne, watch out and if you don't know her, then you probably shortly will.

**Best wishes**

The Executive would like to wish all NZBI members a very happy and safe Christmas and New Year. We hope you all get a chance to enjoy summer and find relaxation ahead of the coming year.

**Craig Davey**  
President

[Craig.Davey@horizons.govt.nz](mailto:Craig.Davey@horizons.govt.nz)

# NETS2009

## QUEENSTOWN

Got anything 'remarkably pesty' from 30 years ago?

The theme for NETS2009 theme is 'Remarkable Changes' – loosely based around what the state of pest management was about 30 years ago, and what the future of biosecurity might hold in 30 years time.

We need you to trawl through dusty archives and hazy memories to hunt out treasures or snippets of pest management circa 1979.

Photos, files, anecdotes – we'll take them all.

Already, Ian Popay has dug up a Noxious Weeds Inspector's folder from 1979 when their conference was last held in Queenstown, and Paul Champion has managed to extract himself, a whole pile of dust, and some pest-related artifacts from NIWA's archives.

So, if you're holding any historic pest booty circa 1979, drop me a line.



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## NZBI news

# News from the branches

## Auckland/Northland

The meeting was held at the Senior Citizens Hall, Fagan Place, Mangawhai Heads. After the branch meeting formalities were over, we had three very informative talks.

Jo Ritchie from Natural Logic Environmental Management spoke on her experiences of the mammalian pest eradication programmes on Motu Kaikoura and Rotokare.

Motu Kaikoura is an island off Great Barrier Island and was treated with an aerial bait drop of Pestoff 20R in the winter covering 624ha on the 26-island chain around Motu Kaikoura.

The target was ship rats which can swim 500m to 700m from island to island, hence the need to treat the surrounding islands.

The 230ha Rotokare Scenic Reserve is in South Taranaki. A total of 12 animal pests have been removed from inside the 8.5km predator-proof fence that has been built around the reserve.

Goals of the projects were to remove pest animals and restore the areas to a healthy and sustainable environment. Keys to success included good planning and communication.

Dr Nick Waipara, from Auckland Regional Council, gave us an update on *Phytophthora taxon agathis* (PTA), a soil-borne disease that can effect all ages and stages of kauri.

Symptoms include yellowing leaves, canopy thinning, dead branches and eventually the death of the trees. Affected trees can also develop large lesions that bleed resin. The disease has been identified in kauri in parts of the Auckland and Northland regions and has been recently listed as an unwanted organism by BNZ.

Research is being carried out into the disease by Landcare Research looking at detection, vectors and disease control methods.

Ken Massey, from Northland Regional Council, gave us a talk on large leaf bush pea (*Pultenaea daphnoides*) a spreading weed in Mangawhai.

The plant is from the *Fabaceae* family and native to Eastern Australia and Tasmania and has naturalised



Auckland/Northland Branch of the NZBI at their November 26 branch meeting.



Above: Bush pea site at Mangawhai. This weed has naturalised on one property in Mangawhai and is spreading along road corridors.



And left: Bush pea (*Pultenaea daphnoides*) foliage and seed pod.



Boneseed leafroller, *Tortrix* sp.

## NZBI News from the Branches Continued

on one person's property in Mangawhai and is starting to spread along road corridors.

The NRC plan to remove the plant from the area by treating with Vigilant and pulling out seedlings. The shrub is 1-3m high, 0.5m-2.0m wide, has bright yellow flowers which bloom in September.

The meeting concluded with visits to a boneseed leaf roller *Tortrix* sp. biocontrol site at Mangawhai Heads and the bush pea site in Mangawhai.

### Greg Hoskins

Executive Member  
Northland-Auckland Branch  
[greg.hoskins@arc.govt.nz](mailto:greg.hoskins@arc.govt.nz)



**Branch members concluded the day looking at a boneseed leaf roller site at Mangawhai Heads.**

## Canterbury

Members of the Canterbury Branch got together for a Christmas barbecue on Friday, November 28, after a working bee controlling boneseed along the walkway from Nicholson Park down to the Taylors Mistake Surf Living Club. It was a pleasant, quiet affair with a superb feed of prawns, crayfish, scallops (hunted and gathered by Keith the day before) as well as other barbecue treats, all enjoyed while looking out over fantastic surf views – a great reward for the team's boneseed control efforts.



**A Canterbury branch member Nick Ledgard on the beach at Taylors Mistake.**

Keith Briden has put in an application to DOC under the Community Conservation Fund on behalf of the NZBI Canterbury Branch for a restoration project along the Nicholson Park and Taylors Mistake Walkway.



**Keith Briden, Nick Ledgard, Richard Hill, Hugh Gourlay and Ravi Kusack relax in the Taylors Mistake Surf Life Saving Club after the Canterbury Branch's working bee controlling boneseed.**

The funding will help with weed clearance and native plantings. The NZBI Canterbury branch thanks Keith for his time and effort in processing this application on our behalf.

### Gemma Bradfield

Executive Member  
Canterbury Branch



## NZBI News from the Branches Continued

### Top of the South field trip to Lake Rotoiti

**T**welve members of the TOS Branch attended a field day at the Rotoiti Nature Recovery Project "mainland island" site at Lake Rotoiti on November 12, hosted by a Department of Conservation team led by Dave Rees. The objective was to update everyone on current animal control practices and to look at the achievements of the decade-long programme.

The morning presentation on current practices and achievement generated a lot of debate. The techniques for maintaining mustelids and possums at very low densities are effective but there are major challenges in managing rats, mice and feral cats. There is a proven technique for poisoning wasps but problems with the availability of an ideal toxin. Intensive monitoring has provided some excellent long-term data, assisting with the development of best management practices. The sensitivity of the different monitoring methods using tracking tunnels generated a lot of discussion.

The response in bird numbers has been variable, and comparison between the mainland island with intensive control of a range of predators, the head of Lake Rotoiti where stoat control is undertaken, and Lake Rotoroa where no stoat control takes place, has provided a much better understanding of predator/prey relationships.

There was a lot of interest in the survival and breeding of the great spotted kiwi with seven pairs translocated from the



*Above: field trip participants set off by boat for the top of Lake Rotoiti.*



*Left: beech strawberry fungus on silver beech (Cytaria gunnii).*



*Lower left: one of the new cat traps in use.*

Goulard Downs area in Kahurangi National Park. Since 2004 four chicks have been born and survived to become adults. Unfortunately, the mother of one was drowned crossing a fast-flowing stream. The young kiwi chicks stay with their parents for over a year, reducing the risk of stoat predation but it means that the adults only nest every second year. With only three females laying, the gene pool is very limited. Planning is under way to see if the low productivity rates can be increased by introducing 10 to 14

kiwi chicks hatched from eggs taken from the Goulard Downs. This will increase the number of breeding kiwi in the site. The fitting of transmitters to the kiwi has provided opportunities for daily monitoring to determine nesting attempts, location and health.

The afternoon started with a boat trip along Lake Rotoiti and the group walked back through the mainland island area. The day provided an excellent opportunity for an exchange of ideas between members from different agencies, an appreciation of what has been achieved by DOC at St Arnaud over the past decade, the realisation that any significant reduction in predator control could lead to a rapid and dramatic loss of biodiversity, and the need for ongoing development of better tools.



*Field trip participants in the bush beside Lake Rotoiti.*

**Lindsay Vaughan**

Branch Chair

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## NZBI news

# Member Profile: Lynne Huggins

Role: Technical Support Officer Threats  
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Hi, my name is Lynne Huggins and I have been asked to introduce myself as I am taking over from Kirsten as the new editor of *Protect*.

To get to where I am now has involved several re-incarnations. I have worked as a pump jockey in a petrol station, supermarket chick, waitress, a mum, a pre-school teacher and in the health system with dysfunctional families. I went to university as a mature student gaining a BSc with honours and completed my MSc while working full time at the Department of Conservation.

I started at Department of Conservation Invercargill 7½ years ago. Initially my job was monitoring, surveillance and some weed control work in the Murihiku Area Office. I am now the Technical Support Officer Threats for Southland. This job involves providing technical advice, including on biosecurity issues, to all the weed teams in Southland, including Stewart Island, Murihiku, Subantarctic Islands and Te Anau. I have been lucky in my job as I have seen many places that most people do not get to, including remote places in Fiordland and Stewart Island, and a trip to Campbell Island.

My biosecurity involvement is mainly in the weed programmes in Southland including the eradication programmes for Darwin's barberry, Spartina, old man's beard and Spanish heath. I liaise regularly with Environment Southland in regard to RPMS weeds, breaches of selling and propagating unwanted plants and any water-weed incursions. I do not really have much knowledge of animal pests but I do know the impact they have on our ecosystems.

At the moment my main biosecurity concern is with



*Lynne Huggins with Weedbuster Cubs in Southland.*

regard to the increase in dairying which is taking place all around the country, and with what weeds farmers are moving to different areas of the country – not only in or on the animals, but seeds attached to equipment and clothing. Some plants are an issue in one area and not in another – do farmers know the RPMS strategy in their new area?

I am motivated to be in biosecurity as I have a passion for plants and the environment, and I want to keep New Zealand a great place for my children and grandchildren.

**Lynne Huggins**

## Biosecurity news &amp; views

## What's in a name? A call for standardisation

**T**he control of plants and animals has been with us for a long time under various guises. Following the Noxious Plants Act, the now well-known Biosecurity Act seems to be well understood and generally accepted. However, regulatory authorities seem to be at odds.

As biosecurity officers, we deal with many people from different walks of life everyday. For a long time the terms used in brochures and publicity has had a confused message: plant pests? Or pest plants? Surely plant pests conveys the message that the insect or disease of the plant is the problem. Not the pest plant which clearly gives the message that it is the plant that is the pest. So what confusion does this convey to the layperson in the street?

The national body, MAF Biosecurity New Zealand, with the National Pest Plants Accord are good examples to lead the way. At present some 65 per cent of the authorities use "pest plants" while the remainder still use "plant pests". New Zealand is too small to have this happening, surely all authorities should be "singing from the same song sheet".

As a country we can not afford to be inconsistent – lets encourage consistency. It is time for a change for a 100% goal, for the betterment of New Zealand and our future.

**John W. Thacker**

Biosecurity Officer  
Environment Canterbury

## Vertebrate pest management symposium papers free to download

The United States Department of Agriculture has posted the proceedings of the International Symposium of Managing Vertebrate Invasive Species, held in Fort Collins, 2007.

Topics of papers include the environmental and economic costs of pest management, public involvement, single species and multiple species management, prevention work, and a range of specific case studies and research outcomes.

You can download the papers from the website [http://www.aphis.usda.gov/wildlife\\_damage/nwrc/symposia/invasive\\_symposium/nwrc\\_TOC\\_index.shtml](http://www.aphis.usda.gov/wildlife_damage/nwrc/symposia/invasive_symposium/nwrc_TOC_index.shtml)

MANAGING VERTEBRATE INVASIVE SPECIES:  
PROCEEDINGS OF AN INTERNATIONAL SYMPOSIUM  
Fort Collins, Colorado  
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Fort Collins, Colorado  
  
2007



## Biosecurity personnel

# NZ biosecurity, biodiversity expert's work recognised with high award

## Shyama Pagad

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**T**he International Union for Conservation of Nature (IUCN) World Conservation Congress, held in Barcelona, October 5–14, brought together in one place about 8000 decision makers from governments, NGOs, UN and academia from all over the world. The purpose of the congress was to debate, share and network, learn, commit, vote and decide on ideas, action and solutions for a diverse and sustainable world.

The IUCN Species Survival Commission (SSC) Invasive Species Specialist Group (ISSG) hosted four events at the World Conservation Congress (WCC) and ISSG staff and members participated in many other events.

Several other invasive species-related events were held including Stop Biodiversity Being Invaded: make the world aware of the threat of invasive species (hosted by the Invasives Initiative IUCN); and CleanTrade: Threading the Needle of Invasive Species and Trade (hosted by the Global Invasive Species programme (GISP)).

A great highlight for the New Zealand team was the award given to Professor Mick Clout.

Mick Clout, Professor of Conservation Ecology at the University of Auckland, SSC Steering Committee and outgoing Chair of the IUCN/SSC Invasive Species Specialist Group, was awarded the Sir Peter Scott Award for Conservation Merit, "in recognition of his unflinching and successful efforts to bring invasive alien species issues to the forefront of IUCN's work and his dedicated leadership of the Invasive Species Specialist Group for 15 years". Mick is the founding

Chair of the IUCN SSC Invasive Species Specialist Group.

Mick's primary research specialty is the ecology and behaviour of vertebrates. After gaining a PhD from the University of Auckland in 1977, he worked as a research scientist with what was the Department of Scientific and Industrial Research (DSIR) Ecology Division in Nelson. He joined Department of Conservation as Manager (Research) in 1989 and started working at the University of Auckland in 1993, where he extended his research interests into areas of biosecurity and invasive species management.

Mick has authored or co-authored about 150 publications, including 96 research papers. He is also the Chair of the New Zealand Biosecurity Ministerial Advisory Committee, and Director of the University of Auckland Centre for Biodiversity and Biosecurity.

Other highlights of the congress included the launch of a very impressively functional, updated World Database on Protected Areas (WDPA), see ([www.wdpa.org/](http://www.wdpa.org/)). The WDPA is a joint venture of UNEP and IUCN.

Results of the most comprehensive assessment of the world's mammals were released, confirming an extinction crisis of the world's mammals, with almost one in four at risk of disappearing forever.

A detailed review of the 2008 Red List of Threatened Species (see [www.iucn.org/about/work/programmes/species/red\\_list/review/](http://www.iucn.org/about/work/programmes/species/red_list/review/)) provides information on the state of the world's species including information on species susceptibility to climate change and development of biodiversity indicators.



**Professor Mick Clout with the Sir Peter Scott Award for Conservation Merit.**



## Enriching biodiversity

# Managing KNEs in Greater Wellington

## Ray Clarey

Greater Wellington Regional Council  
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Since 2000, Key Native Ecosystems (KNEs) have been defined as areas of prime native habitat of regional significance situated on private land. They are primarily native forest remnants but also include wetlands, dune lands and coastal escarpments with significant native flora and fauna values.

The first branded KNE programmes got under way in 1996 and were almost solely focused on possum control in territorial authority reserves such as Otari-Wiltons Bush in Wellington and Porirua Scenic Reserve at Porirua. The programme developed to include more and more sites, including areas of private land, and became more diverse in an attempt to include other pest species in a larger range of natural habitats and ecosystems, such as wetlands and coastal escarpments.

In 2000 it was decided a more robust process for setting priorities was needed. A review resulted in the formation of the Greater Wellington Biodiversity Co-ordinating Group, which today provides the framework for ecosystem and biodiversity management.

The Biosecurity KNE programme is land focused, but is only one of several Greater Wellington (GW) ecosystem management programmes. Others include environmental education, riparian, wetlands, marine and rivers.

## Identifying and selecting sites

In 2000, a satellite imagery system that allowed classification of land cover became available. This was used to determine 7280 individual forest or scrub remnants larger than one hectare. Each site was given a priority score based on a range of factors, such as forest/vegetation class, size, natural character, distinctiveness and importance. The priority scores provided an ability to rank sites and created a focus to try and include the top sites in work programmes.

Of note is the fact that all of the lowland native bush sites that had already made the KNE programme were significantly ranked, justifying their early inclusion.

*Ray Clarey has 47 years experience in the vertebrate pest management industry. In his role with Greater Wellington his focus is on biodiversity and optimising ecological health where the challenges are diverse and the rewards satisfying. He has had a long and supportive role in industry training and policy development. He is shown here cutting the cake at his recent celebration of 30 years of pest animal control work based in Masterton.*

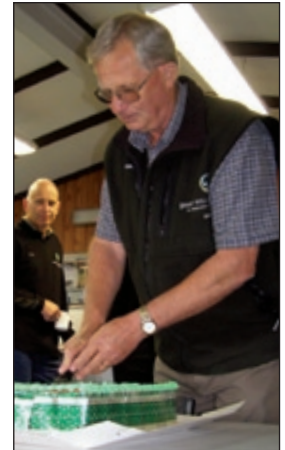


Photo: Jim Flack.

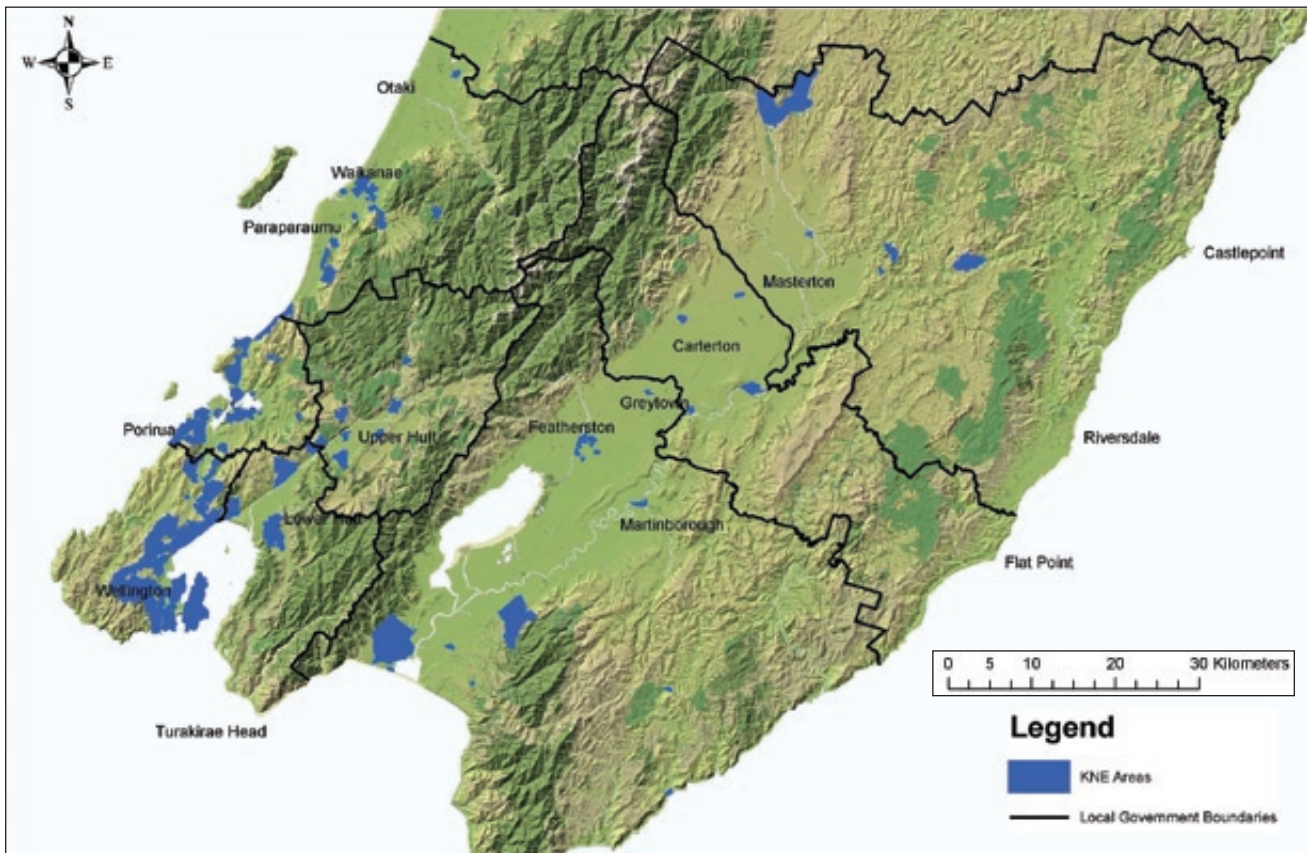
Areas administered by DOC are excluded from the KNE programme as they are managed separately under its Conservation Management Strategy. Unless Crown agencies agree to be bound to, and contribute to the implementation of the Regional Pest Management Strategy through an Order in Council, the Key Native Ecosystem programme will not apply to Crown land.

## Objectives for KNE management

The objective for KNE management is to achieve a measurable improvement in the ecological health and diversity of sites using a range of suitable management techniques, including the following means:

- Ensure KNE are legally protected into perpetuity
- Establish and implement integrated pest management plans for all KNEs
- Undertake direct control by service delivery of pests identified in the management plan for each KNE
- Facilitate the involvement of community groups where appropriate
- Co-ordinate site management with other biodiversity initiatives where possible
- Use biological control agents where appropriate, and support relevant biological control research initiatives
- Monitor site recovery using a range of ecological indicators
- Manage external pressures that are inconsistent with KNE management objectives
- Provide public education and advice to foster awareness of the need for biodiversity management.

## Enriching biodiversity: Managing KNEs in Greater Wellington



### KNEs managed in 2007.

Image: Greater Wellington

**Flowchart used as part of the KNE qualifying process. This is particularly useful for staff from other parts of Council who are involved in overlapping biodiversity issues.**

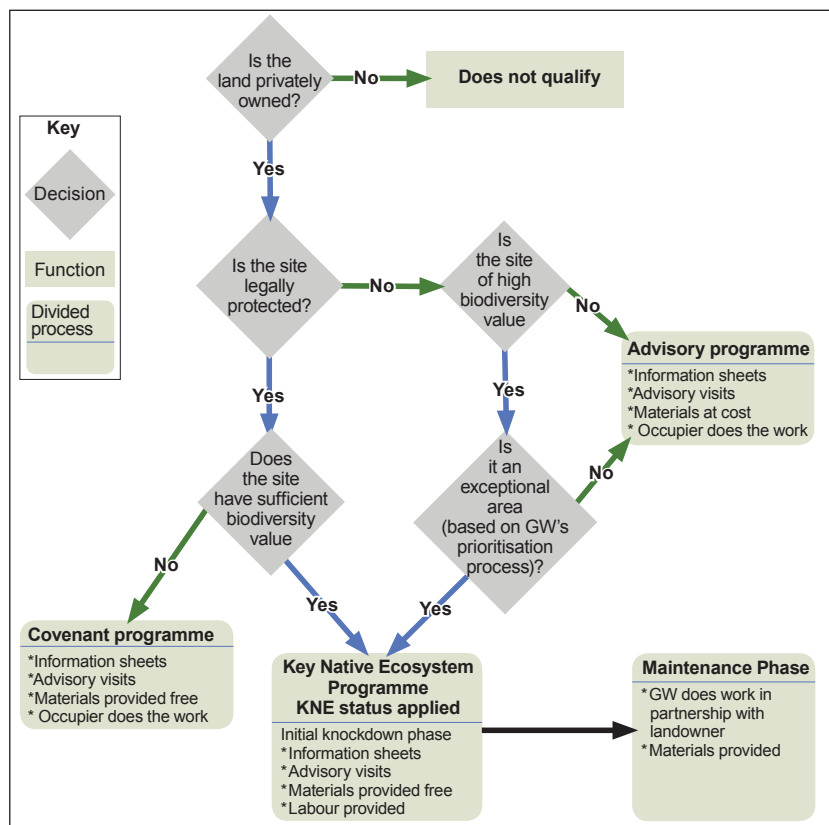
Image: Greater Wellington

### Costs

The budgeted costs for 2008/09 (including overheads) to protect indigenous biodiversity in a comprehensive selection of Key Native Ecosystems is \$650,400 (Pest Animals \$450,500; Pest Plants \$200,000). There are approximately 18,500ha programmed for pest animal treatment for the 2008/09 year.

### The KNE qualifying process

With growing public interest about biodiversity issues, it was decided to refine the KNE qualifying process so that it was easier to understand for other GW staff who were involved in linking



## Enriching biodiversity: Managing KNEs in Greater Wellington

and overlapping biodiversity issues. New KNE sites were only related to legally protected sites on private land. It also was specific in what Greater Wellington would offer by way of service and what was expected of landowners. The new process resulted in a three-tiered assistance programme denoted "Advisory", "Covenant" and "Key Native Ecosystem".

### Programme re-evaluation

A review of the KNE management programme is currently taking place. This review will look at all components of the programme, including goals and priorities, resource allocation, partnership opportunities and funding. This should improve the existing programmes, ensure adequate resource allocation and create improved strategic approaches.

### The Reserves Programme

Essentially, the Reserves Programme has the same set of objectives as the KNE management programme. Reserves are legally protected under the Reserves Act 1977 and/or the Local Government Act 2002. The allocation of GW resources generally follows the principle of giving priority to the least-modified indigenous habitats.

Where priority ecosystems are identified on territorial authority (TA) land, funding is sought from the TA under the Reserves Programme, to form financial partnerships. These partnerships are recognised through annual agreements that seek to support biodiversity and ecological health by jointly implementing pest animal and plant management plans. The intention of these joint ventures is to share operational costs, appoint proficient contractors, review the plans regularly and to give commitment to maintaining existing operations before commencing new projects.

Most reserves are situated within or adjacent to urban areas. The risk management associated with control measures must be of the highest order and always involves permissions from the public health unit. Appropriate engagement with the community on operational risk issues is also mandatory.

### Volunteers and care groups

Care groups and volunteers undertake both pest animal and pest plant control in many TA reserves and areas of private land within the region. Volunteers are involved in at least 21 of the 90-plus KNEs, covering approximately 2250ha of forest, wetland,

estuary and coastal ecosystems.

Several volunteer groups have grown considerably since their establishment and, having been successful in one area, have moved to challenging new sites. Three of the larger and really dedicated volunteer groups are the Makara Peak Mountain Bike Park Supporters, Upper Hutt Branch of Forest & Bird Society, and the Friends of Tawa Bush Reserves. Successful, dedicated volunteer groups such as these are vital to optimising ecological health in the region.

### Ecological monitoring

Monitoring is undertaken in a number of selected KNE sites throughout the region. The monitoring has three aims:

- To determine whether environmental outcomes and objectives have been achieved.
- To determine the direction of maintenance programmes with regard to control methods and priorities.
- To provide an operational and performance measure.

Monitoring programmes are undertaken for rodents, possums, mustelids and native birds. Possum, rodent and mustelid monitoring is useful for comparing populations before and after control. Native bird monitoring indicates relative abundance and trends following predator control.

### Native birds return

Over the past five years there have been a number of newspaper articles concerning native bird species recolonising Wellington, Hutt Valley and Kapiti Coast. Some of the headlines read: "Rare birds sighted at Porirua Reserve", "Native finds its way back to Porirua after 100 years", "Tui returns to Miramar", and "Return of tui to peninsula exciting news". Certainly, observations of tui and kereru have been to the fore but now there are other native birds in the limelight. Kaka, red-crowned parakeet, whitehead, tomtit and bellbird have all been reported in areas once thought to be devoid of these species. This good news continues and certainly helps maintain enthusiasm for biodiversity projects.

There is no doubt that a spillover effect from the Karori Wildlife Sanctuary as well as some translocations by DOC have been part of the reason for the bird comeback but as important has been the ongoing possum and predator control KNE programmes undertaken by Greater Wellington and DOC.



## Pest impacts

# Ecological impacts of Argentine ants in New Zealand

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## Background

The Argentine ant (*Linepithema humile*) was first found in New Zealand in 1990. It is often found closely associated with humans and human activities (e.g. in houses, gardens, plant nurseries and industrial areas), and consequently humans are primarily responsible for its range expansion in New Zealand.

However, Argentine ants will also readily invade many natural environments. What are the present and future impacts of this species in New Zealand's natural environments? Overseas research shows many ant pests impact greatly on native communities. In this article we highlight three research projects demonstrating the negative ecological impacts of Argentine ants in New Zealand.

## Impacts on litter decomposition

Argentine ants affect litter decomposition through modification of invertebrate and fungal decomposer communities.

We investigated the effects of Argentine ants on litter decomposition between paired invaded and uninvaded forest remnants at two locations in Auckland. Litter decomposition plays a key role in ecosystem functioning, affecting soil and plant health. Yet the relationship between decomposition and the affects of invasive ants is largely unknown.

One of the biggest differences was in the abundance of landhoppers (amphipods). There were significantly fewer landhoppers at invaded sites, and we suspect that Argentine ants predate or displace landhoppers when they invade. Landhoppers are an abundant and common part of many natural environments in New Zealand, and play a major role in "shredding" leaf litter for decomposition. However, there was also a strong difference in the types of ant and beetles species found at invaded and uninvaded sites, again suggesting Argentine ants modify invertebrate communities.

The flow-on effects of altered invertebrate communities on ecosystem functioning warranted further investigation. We found there were significant differences in several chemical components of the soil



**Litter bags being prepared, top, and the bags placed in the field where they were sampled to determine the impact of Argentine ants on litter decomposition.**



## Pest impacts: Ecological impacts of Argentine ants in New Zealand

between invaded and uninvaded sites. We also placed "litter bags" into the field and sampled these over the course of one year. The chemical components of this leaf litter (kawakawa) showed that the fibre content of litter was higher, and key nutrients (nitrogen, calcium, magnesium) were lower, at invaded sites, indicating less breakdown of leaf litter was occurring at invaded sites. Furthermore, there was a much lower microbial biomass at invaded sites, indicating that fungal and microbial decomposer communities have been altered with the corresponding change in decomposition and invertebrate communities.

We concluded that Argentine ants may alter decomposition processes by modifying the invertebrate and microbial communities responsible for decomposition. As a consequence there may be longer-term implications for soil and plant health in native ecosystems invaded by Argentine ants.

### Invasive interactions

The interactions between plants and animals can be complex, especially when they are all invasive! Although interactions between ants and scale insects are well known (ants feed on the honeydew produced by sap-sucking insects), their individual and combined effects on plant fitness have seldom been examined. In particular, is the possibility that these interactions could have positive effects on invasive weeds.

We investigated the interactions between Argentine ants, boneseed (*Chrysanthemoides monilifera monilifera*), and sap-sucking scale insects (*Saissetia oleae* and *Parasaissetia nigra*), all of which are invasive in New Zealand.

We measured the densities of scale insects, the behaviour of Argentine ants, the damage on plants associated with herbivores, and the production of buds, flowers and fruit on boneseed plants (to estimate plant fitness).

Argentine ants spent one-third of their time specifically associated with scale insects, and their numbers were highly correlated with scale insect densities.

The presence of Argentine ants significantly changed the types of invertebrates on boneseed plants. Uninfested plants had significantly more predators (mites, spiders and beetles), and also significantly higher herbivore damage. This corresponds with results from overseas which show Argentine ants exclude almost all other invertebrates in order to monopolise the plant and protect the sap-sucking insects.

In terms of plant reproductive success, significantly more fruits were produced in the presence of Argentine ants! As a consequence, Argentine ants may enhance the spread and invasion of boneseed!



**Boneseed infestation, above, and Argentine ant-scale interaction, right.**

Photo at right:  
Alex Wild,  
[www.myrmecos.net](http://www.myrmecos.net)



Although the exact mechanism of this increased fruit production has not been pinpointed, one possibility is that pollinators are forced to relocate more frequently to avoid attack by ants, resulting in an increase in pollen transfer and higher fruit/seed set (something which has been demonstrated overseas with native ants).

Increased fruit-eating by a greater diversity of invertebrates on uninfested plants could also cause this effect. More research is under way to untangle the mechanisms involved.

### Where's my boneseed biocontrol agent?

Biological control of boneseed was initiated in 2007 with field releases of the boneseed leaf roller (BLR), *Tortrix* s.l. sp. '*chrysanthemoides*', from South Africa.

**Boneseed leafroller, *Tortrix* sp.**

Photo: Chris Winks



## Pest impacts: Ecological impacts of Argentine ants in New Zealand

We undertook several experiments and observations to quantify the effect of generalist predators (Argentine ants) and parasitoids (braconid wasps and tachinid flies) on the establishment of BLR. We placed a mesh bag around a small part of the boneseed plant to exclude Argentine ants and protect the BLR; comparing the results to “unbagged” BLR.

Without the mesh bag no BLR survived. With a mesh bag, BLR had a very much reduced survivorship on plants infested with Argentine ants (10% versus 54% on uninfested plants). We also observed >14% parasitism. These preliminary results indicate that generalist predators (particularly Argentine ants) and parasitoids are effecting the establishment of BLR.

We also suspected that ants would mostly attack BLR (and other invertebrates) only if sap-sucking insects were actually present on the plant (i.e. more incentive for them to protect “their” resources). We observed the behaviour of Argentine ants towards a weevil (herbivore) and measured the time taken for Argentine ants to discover the weevil and then to change its behaviour or displace it from the plant.



**Argentine ant.**

Photo: Alex Wild,  
[www.myrmecos.net](http://www.myrmecos.net)

In the presence of sap-sucking insects it took Argentine ants a very short time (1-2 minutes) to find and displace the weevils. This was 83% to 87% quicker than when sap-sucking insects were absent, confirming our predictions.

More study is planned for the summer of 2008-2009 to examine if BLR can find refuge from Argentine ants in the growing tips of boneseed plants.

The consequences of Argentine ant invasion can be varied; not only does their invasion have consequences for maintaining biodiversity and ecosystem functionality, their invasion may also affect weed and pest-management approaches.

## Control methods

## CONNOVATION

CONSERVATION BY INNOVATION

# Alternatives to Brodifacoum for Possums and Rodents - How & Why?

Charles Eason, Ray Henderson, Steve Hix, Duncan MacMorran, Aroha Miller and Shaun Ogilvie  
Lincoln University, PO Box 84, Lincoln; Pest-Tech, PO Box Leeston; Connovation Ltd, PO Box 58613, Auckland.

## Background

- Brodifacoum is a 2nd generation rodenticide used worldwide for commensal rodent control.
- Used to eradicate rodents from islands.
- Possums are susceptible to brodifacoum baits but not to 1st generation anticoagulants.
- It has been the only alternative to 1080 that effectively targets both possums and rodents.

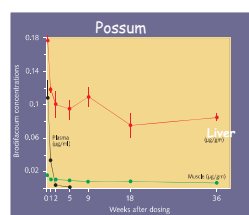


Figure 1. Typical persistence profile after sub-lethal dosing (0.1 mg/kg) brodifacoum which would be similar in game or birds. (Adapted from Eason et al. 1996).

## Why Seek to Improve?

- Brodifacoum has an unusual persistence (Fig. 1).
- Persistent organic compounds (POC's) e.g. DDT and brodifacoum, bioaccumulate along terrestrial food chains.
- Repeated field use of POC's, including 2nd generation anticoagulants, is unwise and discouraged (see US EPA rodenticide mitigation – decision May 2008).
- Brodifacoum residues have been found in pigs, weka, morepork, harrier, pukeko, grey duck, robin and saddleback many months after possum control.
- Bioaccumulation to lethal concentrations occurs in non-targets on repeated use.

## Criteria and Goals for Baits Containing Alternatives to Brodifacoum

- Ideally a single bait will be capable of killing possums, rats and mice.
- Baits must include toxins that have relatively low persistence (Table 1).
- Different types of toxic baits should include either fast or slower acting poisons.

## Provision of Low Residue Alternatives (Table 2)

- Feratox<sup>®</sup> has provided a low residue humane alternative for >10 years for possum control for licensed professionals.
- Cholecalciferol paste (Feracon<sup>®</sup>) was registered in July 2008 for rodents as well as possums.
- A product license application was filed (June 2008) for zinc phosphide paste for possum control. New data is being generated to extend this registration to rodents and possums.
- Registration dossiers on low dose cholecalciferol with coumatetralyl as a slow acting alternative are being finalised for submission.

Table 2. A summary of key characteristics of low residue alternatives to Brodifacoum.

Key: p + possums; r = rodents; w = wallabies

	Species	Fast or slow in onset	Persistence	Relative humaneness vs brodifacoum	Comment
Cyanide pellets Feratox <sup>®</sup>	p+w	Fast	Low	High	Most humane
Zinc phosphide	p+r	Fast	Low	Moderate	Fast acting. Product registration filed June 2008
Cholecalciferol Feracon <sup>®</sup>	p+r	Moderate	Moderate	Moderate	Registered for rodents and possums
Low dose cholecalciferol + coumatetralyl	p+r	Slow	Moderate	Moderate	Dossiers in preparation for registration
Diphacinone	r	Slow	Low	Moderate	Least persistent anticoagulant
Brodifacoum	p+r	Very slow (in possums)	Extreme	Poor	Very effective but not intended for repeated field use

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Table 1. Summary vertebrate pesticides half-lives and expectation for persistence of residues in sub-lethally exposed target or non-target species (adapted from Eason et al. 2008).

Key: + no published value but likely to be <12 hours.

Compound	Half-life values in tissue or blood	Likely persistence of residues after sub-lethal exposure
Cyanide	+	12 – 24 hours
Zinc phosphide	+	12 – 24 hours
1080	<11 hours	7 days
Pindone	2.1 days	4 weeks
Diphacinone	3 days	6 weeks
Cholecalciferol	10 – 69 days	12 weeks
Coumatetralyl	50 – 70 days	12 – 16 weeks
Brodifacoum	130 – 300 days	24 months or longer
Bromodiolone	170 days	24 months or longer
Flocoumafen	220 days	24 months or longer

## Conclusions

- Brodifacoum has been the only alternative to 1080 registered for both rodents and possums.
- This is no longer the case.
- Alternatives are being registered which will be effective against both rodents and possums.
- There are no "silver bullets" and different tools have different advantages and disadvantages.
- Traditional and alternative baits and traps should be integrated to meet site-specific needs to achieve eradication or sustained control.

## Acknowledgements

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Pest-Tech

CONNOVATION  
RESEARCH

Lincoln University



## Habitat protection



*Flamingos and glasswort: the landscape of the Camargue area on the delta of the Rhone river.*

# Summer reading – the Camargue

Auckland Regional Council Biosecurity Officer **Greg Hoskins** spent five weeks touring in France in September and October. Here he reports on the Camargue, a unique area of wetlands at the mouth of the Rhone which he visited.

**T**he Camargue, near Arles in the south of France's Provence region, is a unique area with a fragile ecological balance. The Rhone river as it flows into the Mediterranean sea has produced a delta of 140,000ha of wetlands, pastures, dunes and salt flats that make up the Camargue. The region hosts a unique collection of flora including three varieties of glasswort, and fauna such as flamingos. The pastures provide grazing for the Camargue black bulls and small white Arab-type horses. It is said the region produces the finest hay in the world which is harvested for the thoroughbred horses of top stables. Salt and rice are also produced in the Camargue.

The interests of the rice growers and those of the salt industry have long been in conflict. Traditionally, the release of the freshwater used to flood the rice fields into channels reduced the salt content of the briny water and upset the salt producers. The Camargue nature reserve has been formed to help protect the region and has led the parties, such as the farmers and salt producers, to discussions as soon as a problem arises. Now farmers discharge their waste water into the Rhone river and the salt works pump directly from the sea.

The salt marshes of the Camargue provide great



*A rice field in the Camargue.*

Photos: Greg Hoskins

breeding grounds for many birds, especially flamingos as well as providing food such as micro-organisms on which the birds feed. The marshes also offer vast living areas protected from disturbance by people and animals.

It is estimated 20,000 flamingos nest in the Camargue from May to June. Part of the population migrates south to Africa in winter, however a major population remains in the delta although some are killed by an occasional night frost. The area where they breed is protected and



## Habitat protection: the Camargue

many local enthusiasts have devoted themselves to the study of this bird.

The black bulls and white horses have shared the region for many years. The breed of Camargue bulls appears to have descended from a cross between ox and Asian bulls. The bull contest is a popular event at which the animals are not killed but instead red rosettes are plucked from between their horns with a small hook. The men who partake in this are called "razeteurs" and with feints and diversions, try to entice the bull to run towards them in order to grab its rosette. Trophies are awarded each year to the best razeteurs. It can be dangerous with two razeteurs killed and a number gored by the bulls over the last 20 years.

The Camargue horses develop their white coat as adults, after about five years. These small sturdy horses are never stabled and were once used to thresh grain.

The flora is affected by the high levels of salinity in the soils with the salt plains scattered with three varieties of glasswort. The horses and bulls like to graze these salt



***A string of the arab-type horses step out in the Camargue.***



***About 20,000 flamingos nest in the Camargue, many of which remain there year round.***

pastures which are beneficial to them. An unwanted animal in the Camargue is the coypu, a semi-aquatic rodent, also known as swamp beaver, introduced from South America, which has spread and is undermining the dikes and embankments with their burrows.

The conflicts of the interests of the farmers, salt producers, landowners and users of the region could have led to a disastrous imbalance for the Camargue. However, they are instead working together to protect the flora, fauna and ecological balance of the region to safeguard it for future generations.



## 'Check, Clean, Dry' summer campaign kicks off

**T**he Check, Clean, Dry summer campaign is under way for the fourth consecutive year. While the programme runs through out the year, the summer months are particularly important as more people are out and about on our lakes and rivers.

The campaign encourages fresh waterway users to Check, Clean, and Dry all equipment when they move between waterways to slow the spread of the invasive alga didymo and other aquatic pests.

MAFBNZ is continuing to support regional councils to undertake summer advocacy work related to didymo and other aquatic pests. Advocates are employed to

talk to people using key waterways in each region and distribute awareness material and decontamination equipment.

MAFBNZ is also continuing to fund advocates at both Interislander and Bluebridge ferry terminals to communicate the Check, Clean, Dry message and encourage people – especially those who have used South Island waterways – to adopt the desired behaviours.

This summer there will be more posters and signage on the Interislander ferries, and didymo information in the new Interislander magazine.

## Bee mite movement controls revoked

**M**AFBNZ revoked all movement controls associated with varroa bee mite from 25 September 2008, following evidence that the mite was established in North Canterbury.

The high density of hives in Canterbury and the lack

of geographical barriers meant there was little scope for an effective movement control in the South Island.

Some of the remaining response funds will be used to help beekeepers adapt to varroa through advice, hive testing, and education workshops.

## US lifts flower/foilage import ban

**T**he United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA-APHIS) has approved the resumption of imports of New Zealand field-grown cut flowers and foliage to the United States.

Effective from November 1, 2008, all field-grown cut flowers and greenery produced under the MAFBNZ Phytosanitary Compliance Programme have been accepted into the US.

Cut flowers and foliage grown in a hot/screenhouse

environment had already been granted access in an earlier concession.

New Zealand's cut flower and foliage exports to the US, worth about \$12 million a year, were suspended following the interception of a light brown apple moth in a flower consignment from New Zealand.

The suspension put in place on September 12, 2008, affected crops grown in both indoor and open environments.



## Research reveals mixed attitudes towards pests

One person's pest can be another's friend, according to research commissioned by the MAF Biosecurity New Zealand (MAFBNZ) pest management group.

Understanding key audience attitudes and behaviours towards pests will help MAFBNZ and others in the biosecurity sector motivate New Zealanders to take greater responsibility for their biosecurity risk-related activities.

Focus group interviews were held with hobby and expert gardeners, land contractors, landowners, pet traders, nursery and plant retailers, and freshwater aquaculture farmers.

The audiences consistently described a pest as something that is invasive, destructive and spreads disease – but what actually constitutes a pest was highly personalised. For example, what one person sees as an attractive garden plant may be costing someone else considerable time and money to control.

Respondents had their own list of priority pests based on what directly affected them. The bigger the threat to the individual – emotionally and financially – the more motivated they were to control the pest.

There was more concern for localised pests that were noticeable in respondent's immediate surroundings. While respondents appreciated the broader environmental impacts of pests and the need to protect New Zealand as a whole, they lacked deep knowledge of the specific harm that was caused by pests. The feeling that "the job is never done" was evident in some groups.

MAFBNZ presented the research to the Biosecurity Co-ordination Group in September and to regional council community relations managers in November. Biosecurity agencies have a vital role to play in changing behaviour, promoting the consequences of pests for the broader environment and making the harm they cause more personally relevant.