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Protect

Autumn 2010

Magazine of the New Zealand Biosecurity Institute

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Editor's Note

Hi everyone, how's things? I hope you all had a great break and took things easy.

This year seems to be marching along at a rapid pace with a third almost gone. As usual I made a couple of New Year resolutions, did you? I would love to hear yours and whether you are keeping to them. I decided that there should be more of a balance between work and life and that my husband Trev and I would have a weekend away each month. As yet this hasn't happened, and it isn't likely to happen this month. We have both been busy with work and Trev has been busy making his art sculptures.

This issue I have focused on animal control, a subject that is quite fascinating and innovative. New Zealand leads the world in aspects of animal control, not bad when you consider our population base. In Southland, DOC has undertaken some great projects including removing rats from Campbell Island and assisting local iwi to remove rats from some of the Mutton Bird Islands.

One sad thing I would like to mention is Keith Crothers has left Environment Southland after 30 years in the pest plant field. He has defected and gone to work with Rugby Southland. Read what he has to say in the member profile section. All the best in the future Keith, you will be missed and thank you for all the effort you have put in over the years for the NZ Biosecurity Institute.

That's all from me. Enjoy reading this issue while doing so think about the next issue and what you can contribute.

All the best, **Lynne Huggins**

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New Zealand **Biosecurity** Institute

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Executive meeting

The Executive met on March 3 to discuss a number of general business matters and an idea floated at NETS2009. The minutes of this meeting will be on the website but the main topics are outlined below.

Biosecurity week – a concept

The concept of NETS week being used to further highlight biosecurity to the wider New Zealand public was floated by a member. As we all know, biosecurity is vital for NZ's ongoing economic and natural heritage sustainability – so let's highlight this to as many people as possible. By leveraging off the great event that NETS is, and the fact the DOC TSO's and biosecurity managers gather in the same week, we might have enough of a core group of people and activities to excite our local and national media. This fact was reinforced by topics and people at NETS2009 making it into local and regional press.

The Executive is keen to progress this project with a scope at NETS2010. Some of the ideas generated by the group were to have a co-ordinated pooling of success stories from around the country delivered at NETS to a primed media. There could be interviews with locals from the various field trips filmed/taped prior to the week and released during the NETS event.

Obviously this is just the genesis of the concept and it will take hard work and drive to establish a good long-term structure to kick it into life and keep it that way.

I hope this pricks your creativity and enthusiasm – if you want to add ideas or comments then please visit the forum page on our website.

GM policy

Correspondence received made us aware that our current GM policy may be out of date. Peter Russell, the member who co-ordinated our policy production, was asked for comment. The advice back to the Executive was that, yes, the correspondent was accurate in stating that our policy was in need of a refresh. Peter will consider the comments and prepare a reply. Any renewal of this policy is going to take considerable time and effort and as such we will discuss this point at the AGM. In the interim, we will note on the website that we are in the process of updating the policy. With GM science continually moving forward, if there are members who have specialist knowledge or would like to contribute to this discussion then please contact the President.

Clause 10.5 – A first test

Under Clause 10.5, branches may apply in writing to the Executive for special grants to enable them to undertake activities.

We have received our first proposal for funding branch activities. This was interesting as we have not prescribed a way of going about this. After deliberating we decided it would be helpful to have a set of guidelines to detail the type of activities that would be funded and the format and information required to enable a decision to be made. We will have this completed soon and ready for the next application for funding branch activity.

Gemma Bradfield departs

Gemma has been the Executive representative for the Canterbury/Westland branch since 2006 and has recently stepped down from her position. The Executive wishes to thank Gemma for her contribution on behalf of the branch and input into Executive business. Gemma's energy is being temporarily diverted in preparation for a wedding – we wish her all the best for the future.

Subscriptions

As usual, the deadline for subs is April 30. There are two important reasons for paying your subs by this date. Firstly, at $30(incl) they are $10 cheaper than subs paid after that date; and secondly, **you are only eligible for a member's registration fee at NETS if you have paid by, April 30**. It would also be good if you can inform us if your contact details change. In particular if you change jobs it would be good to know if you are resigning from the NZBI or if you have new contact details. Our Treasurer spends a lot of time chasing up lost members and rejected email addresses; this is frustrating and time consuming.

Branches

The branch round-up at the latest Executive meeting highlighted a number of great events and activities happening in the branches and you can read about some of them in this issue. As usual each branch has its own style influenced by geography/distance and the keenness of members, with one branch in particular having such a fondness for Christmas barbecues that they had two in 2009!

This is a reminder that branch AGM's need to be held in good time so any nominations for national office or other remits can reach the Secretary prior to our AGM notification period which this year means no later than the first week of June. Following branch AGMs

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the national secretary also needs to be notified of any changes in personnel.

NETS2009

The final accounts for NETS2009 are being processed. NETS2009 will finish with a surplus of roughly $10,000 to $11,000, with the final amount to be confirmed after our next GST return. This is a great result given the tough economic times last year. The committee should be very proud of being able to put on an excellent NETS that lacked nothing and ending with a surplus.

NETS2010

The hard yards have been done and now it's only the waiting to get through before another great opportunity to catch-up on the latest and greatest in biosecurity is upon us.

Put NETS2010, July 21-23, Blenheim, New Zealand, into your diary now.

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News from the branches

Top of the South marine biosecurity field day

Eleven members of the TOS branch and six colleagues attended a marine biosecurity field day in Nelson on February 16, hosted by Cawthron Institute staff. The objective was to provide an opportunity for members to look at the challenges posed by marine biosecurity.

The morning presentations started with an overview from Lou Hunt on the role of MAFBNZ in marine biosecurity. She noted the values at risk in the marine environment and the risks from marine hitchhikers. She then described MAFBNZ's contribution to New Zealand's marine biosecurity system – the work at the border to stop marine pests arriving; the surveillance programme; the response to new incursions and management of established marine pests; policy; risk analysis; investigations; and communications. This included building regional partnerships (for example, Top of the South), and providing oversight and leadership.

Russell Minchin described the role of the regional co-ordinators in the implementation of the Top of the South marine biosecurity strategy and the development of a series of operational plans. This partnership is co-funded by the three councils and MAFBNZ with some seed funding from MFish and a commitment from the aquaculture industry to provide in-kind assistance.

Barrie Forrest of the Cawthron Institute, outlined the marine biosecurity research being undertaken to identify potential high-risk pests and looking at vector risk and how these risks could be managed. In-water plastic wrapping of vessels had been locally developed and has been successfully used for some time, although there are challenges in scaling up from small to large vessels. Novel mitigation tools included biocontrols, development in anti-fouling compounds and bioBullet, a micro-capsulated compound such as KCl that is toxic to target pests after ingestions.

Barrie also spoke of the work done by Cawthron on management of bio-fouling from the oil rig, Ocean Patriot, which defouled in Tasman Bay, depositing brown mussels on the sea floor. There was concern that these could impact on green mussels through competition and inter-breeding. He described the pro-active work done with the Kan Tan IV, a drilling rig from the Caribbean that had undergone intensive defouling before arriving in NZ waters.

Achim Janke, manager of the Cawthron Institute's Aquaculture Centre with tanks of oyster larvae.

The afternoon involved a visit to Cawthron's Aquaculture Centre at the Glen to look at the breeding, feeding and raising of shellfish larvae. There was a very strong emphasis on water quality and on maintaining consistent levels of nutrients, temperature and oxygen levels in the water used to feed the larval stages. Members were impressed with the enthusiasm and commitment of the Cawthron staff at the centre and what they has been achieved. A few lucky members managed to sample some oysters.

The presentations stimulated a series of wide-ranging discussions which highlighted the challenges of operating in a marine environment with few control tools, many unidentified organisms, microscopic stages of lifecycles, and little or no control over vectors.

Members check out the saltwater ponds at the Cawthron Institute's Aquaculture Centre at the Glen.

Lindsay Vaughan
Executive member
Top of the South Branch

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Lower North Island:

Weedy Wellington Workshop – Developing a local pilot project to tackle regional and national weed management challenges

On Tuesday December 18, the Sustainability Trust hosted a workshop in Wellington to explore the current challenges and opportunities around environmental weeds in New Zealand.

In attendance were representatives from the Department of Conversation, Forest and Bird, Greater Wellington Regional Council, Landcare Research, NZBI, Sustainability Trust, Weedbusters, Wellington Botanical Society, Wellington City Council and Zealandia (Karori Sanctuary).

After a round of introductions in which attendees shared their current weed-related focus and recent success stories, the group got down to the business of brainstorming around four questions.

Question 1: What challenges are we currently facing around environmental weeds?

Some of the most pressing challenges identified by the group included:

- Awareness at all levels i.e. from politicians to the community
- Different priorities between organisations
- Need for advocacy to facilitate better collaboration between organisations
- Sharing information between organisations
- Need for standardisation of terminology

Question 2: What would Aotearoa's weed situation look like in 2050 if we were supported really well?

Some of the group's ideal ("magic wand") future outcomes included:

- A well-informed general public who are aware of weed species and the threats they pose
- Organisations which have a co-ordinated regional and national approach
- The existance of one-stop, open access database
- Financial incentives for responsible land management
- Broader landscape approach to environmental weed control

Question 3: What steps do we need to take to achieve our 2050 vision?

Some of the key areas requiring forward progress included:

- Inter-agency policies for information sharing and developing communication networks
- Sharing best practices to allow for the most efficient use of resources

Participants at the Weedy Wellington Workshop.

- Strong managerial support and leadership
- Biosecurity Act review
- Education/advocacy programmes

Question 4: Who will be doing what? How will we work together from here?

The group used this question as a catalyst to develop a pilot project for the Wellington region that could form a case-study for achieving some of the goals that had already been identified. It was decided that a shared weed-map of Wellington was a priority for action. The sharing of spatial information from a number of different sources and agencies was seen as encompassing many of the challenges identified during the workshop. Representatives from the Sustainability Trust hoped to assist the group to achieve this outcome by facilitating a bid for funding from the Ministry for the Environment's Sustainable Management Fund.

The workshop closed with participants feeling a refreshed sense of cohesion and empowerment towards a positive future for the management of environmental weeds in Wellington. Unfortunately, as Murphy's Law would have it, the day after the workshop, the announcement was made that this year's Sustainable Management Fund was being cancelled. However, the collective energy of the workshop's participants and willingness to work together means that this setback will only increase the group's motivation to move the project forward.

Pedro Jenson
Greater Wellington Regional Council
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NZBI biosecurity personnel profile

Keith Crothers reflects on his time as a biosecurity officer as he moves on

Role: Club Rugby Manager and Referee Educaton Officer
Rugby Southland

Last November, I had a very difficult decision to make – should I apply for another job? And if that wasn't difficult enough, two weeks later I had to think about whether I should accept the position I was being offered by Rugby Southland; that of a Club Rugby Manager and Referee Education Officer. And believe me, it was a difficult decision given that I had just completed 30 years as a noxious plants officer and latterly a biosecurity officer.

I had been asked just prior to this exactly what it is that I do in 10 words or less. After lots of soul searching I came up with "Develop, implement, monitor and report annual pest plant work programmes". In other words, get others to kill weeds!! Doesn't sound all that glamorous but it is something I have enjoyed for all of those years. The job changed enormously over the years and I can honestly say that I was never bored and more often than not looked forward to going to work each day. Now, whether I have made any difference to "weeds" over those years, I am not too sure.

I started with the then Southland County Council way back in 1979 and worked under the District Noxious Plants Authority banner. In 1989, they became the Southland District Council through local body amalgamation and even though it was a regional council function, my role was contracted to the district until I was finally brought "in-house" to the Southland Regional Council (brand name – Environment Southland) three and a half years later.

After three decades in a biosecurity role, and having seen a lot of changes, Keith Crothers has moved into a new field of employment.

Before taking on the role with noxious plants (we now call them pest plants) I was a policeman here in Invercargill for five years – that's what brought me south from Christchurch. Before coming south I had worked for Lane Walker Rudkin in a jockey underwear factory as a time and motion study engineer.

So here I was contemplating a change in career. I reckoned that I could have easily stayed doing what I did until whenever I wanted to. And when I really thought about that I believed (rightly or wrongly) that my employer was not going to be getting the best out of me. I was too comfortable and I was not challenging myself. And let's not mention the politics!! While the decision to leave Environment Southland was not an easy one, once I made it (and ever since) I have had absolutely no regrets. It is not every day that an opportunity comes along like the one I had. I have a real passion for our national game and over many years had different voluntary roles within both club and provincial rugby in Southland. The Stags (Southland's premier rugby team) had just won the Ranfurly Shield and the World Cup is coming next year. It was the right time to jump ship and so it was that I simply swapped the "Environment" for "Rugby". So I am now a rugby administrator rather than a pest plant administrator.

For those of you who were in Queenstown at last year's conference, you may have been present when I gave my talk about the past 30 years and my experiences

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and views over that period. If not, then you will be able to check it out on the abstracts on the website.

I have thoroughly enjoyed my time as a biosecurity officer and the opportunities I was given by my employers for professional development were unending. I loved learning so I was always eager to be doing something.

So now one month into my new job and all is going well. I am preparing for the rugby season ahead which started here 20 March 20 and won't finish until about the end of October. Preparation is the key and the weeks leading up to the season are the busiest. We have to ensure that every referee and coach attends a compulsory one-hour "Rugby Smart" session before the season begins. We do this on behalf of the NZ Rugby Union as they have an arrangement with ACC to deliver a rugby safety message. And in case you are interested, since this has been implemented, rugby injuries have reduced remarkably.

And no longer do I have the luxury of all things good. Rugby Southland is a small organisation in terms of permanent staff (14) and there are no "luxuries". Every dollar is scrutinised and used well. But we are big in the community and it is great to see the Ranfurly Shield sitting outside my office, not that it happens very often because it is usually doing the rounds in Southland. We have truly celebrated having this prestigious trophy and look forward to defending it later this year. And in case you are wondering; NO, I do not have to wear the Stag mascot suit!!!

I want to finish by simply wishing everyone in the Biosecurity Institute all the very best for the future. It has been a real pleasure working with and meeting some of you and I know that the work you are doing is of vital importance to this country. And if you are getting sick of the job just remember this: "The best way to appreciate your job is to imagine yourself without one".

Anyone wanting to catch up with me in the future can do so by either phoning me on 021 808 295 or email at keith.crothers@rugbysouthland.co.nz

Go the Stags!

Keith Crothers

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Animal control

Simple rabbit control method proves effective dune situations

Sarah Brill
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Controlling rabbits prior to planting is important for any revegetation project and none more so that in dune restoration. Rabbits can do serious damage to new plants in just a single night. Dunes are often accessible to the public which requires control programmes to be planned and executed more carefully.

In high public-use areas being able to remove leftover bait after a control programme is ideal. The commonly used broadcast method for Pindone does not allow for this removal.

Alby Osborne (pest animal officer) in conjunction with Pim de Monchy (coast care officer) at Environment Bay of Plenty have been trialling a successful method using squares of shade cloth pinned down at the corners. The cloth also has a drawstring around the edge allowing its easy removal and the collection of any remaining bait. This simple device offers the bait in a way that can also deliver a pre-feed if necessary. Removal of any leftover bait is easily achieved.

A shade-cloth mat in place in a high-use sand dune area.

The mats are pinned down in areas where rabbit sign is present and Pindone cereal pellets are placed on the mats. The mats have several advantages over broadcasting including ensuring containment of bait delivery; bait is not in direct contact with the ground; bait spillage is minimised; and they are easy to remove and shift.

Two additional monitoring benefits were highlighted during the trial. Monitoring of bait uptake has always been difficult with the broadcast bait application method With delivery on the mats, not only could the amount of bait taken be seen at a glance but the number of rabbit faecal pellets left on the mats gave an indication of numbers of rabbits visiting the mats and the baits. When these pellets appear green in colour from the dye in the bait, it indicates the rabbits are feeding and ingesting the Pindone pellets.

A further advantage was that the mats created a microclimate for the grass underneath, shading and trapping more moisture and allowing the grass to grow faster than grass not under the mat. These fresh grass shoots coming through the mat are very attractive to rabbits and can serve as a pre-feed attracting rabbits to the site. It was also noticed that rabbits visit the mat without any form of bait or lure and leave faecal pellets and urine patches to indicate their visit. The attractiveness of the mats could also be due to the increased moisture in the plants at the site, especially in a dry climate such as dunes.

The mats do not fill the technical criteria for a “bait station” as defined by the Agricultural Compounds and Veterinary Medicines Group, as they are not rigid nor do they reduce access for non-target species. However they are cheap, easy to use and an effective way to deliver and remove rabbit bait in high public-use areas. They also provide useful monitoring data and can be used as pre-feed stations.

They are legal to use by anyone holding a Controlled Substance Licence for Pindone or under the supervision

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of anyone who holds a Controlled Substance Licence.

Advantages of using mats

- Allows total removal of toxin from an area if required for any reason.
- Allows inexperienced persons to confirm the presence of rabbits in an area.
- Economic – reduces the amount of bait required in a given operation, i.e. kgs/ha which also limits the amount of toxic bait available to non-target species at any given time.
- Allows cereal bait to be removed when weather is bad and put back out when the weather improves.
- Allows total control of bait placement and removal to suit any situation, i.e. the presence of stock, pets etc.
- Enables the operator to move the same bait from one place to another without needing to purchase additional bait.
- Control operations can be suspended (bait removed) over a weekend, for example, and replaced again at the beginning of the week, leaving areas safe for the public over the weekend.

Simple but effective: Green Pindone pellets on one of the shade cloth mats. Also visible are small round rabbit droppings. This particular mat was situated on the dunes at Papamoa Beach, where the landowner only granted consent for the poison to be used if the council and its contractors could guarantee removal of all baits at short notice – something which the mats enabled them to do. Photo: Maria Corbett

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Species interactions and consequences of pest control in forest ecosystems

Wendy Ruscoe[1], **Sam Cave**, **Peter Sweetapple**, **Roger Pech**, **Mandy Barron**, **Ivor Yockney**, **Mike Perry**, **Roger Carran** & **Chris Brausch**
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Introduced mammal pests pose a major immediate threat to biodiversity conservation in New Zealand. In order to understand the responses of individual pest species to pest control, a greater ecosystem-level understanding of the interactions between multiple pest species is required. Over the last four years a group of researchers at Landcare Research have been studying the impacts of various pest species on native biodiversity. Research has focused on the sequence of responses by both invasive and native species following common pest management operations in North Island mixed forest (Kaimai Ranges, Mamaku Plateau, Whirinaki Forest Park, and Te Urewera National Park).

For six months before and three years following an aerial 1080 operation we monitored possum, ship rat, house mouse and stoat populations. We also monitored non-treatment areas – areas that had not been controlled by 1080. For possums, rats and mice we live-trapped the animals three times a year, marking and releasing all animals caught in order to estimate population density. Stoats are more problematic to work with so we monitored their populations using a combination of tracking tunnels and hair-tubes. Hair tubes are similar to tracking tunnels except that as the animal runs through, a sticky surface pulls out a few hairs which are then used to identify the individual animal using genetic technology,

On the trapline: Ivor Yorkney carries traps in which possums were live trapped, marked and released.

The 1080 poison killed most of the possums and ship rats in the operation area but not the mice. However, it took less than a year for ship rat numbers to bounce back to densities they were previously (5 per ha). In the next six months rat numbers doubled on the 1080 sites and remained at this level (12 per ha) for the duration of the study. The 1080 operation reduced the possum population to less than 1 per ha, thereby reducing Tb threat and damage to canopy foliage. As possums are slow breeders, numbers stayed low for the following three years. However, perhaps as a result of reduced competition for food (forest fruit, flowers and seeds), the rat population was able to "explode" and remained high during this time thereby increasing the potential threat of rat predation to susceptible birds and invertebrates.

On a second set of sites we followed up the 1080 control operation with ground-based rat control using Ditrac blocks (diphacinone) in bait stations. This kept rat numbers low but consequently facilitated an increase in house mouse numbers. This outcome following rat control has now been shown in many pest control sanctuaries around New Zealand and there is uncertainty surrounding the implications of increased mice numbers for native biodiversity. Smaller invertebrates that are prey items of mice may well be suffering increased predation pressure but this remains to be quantified. A positive outcome of the rat control was a significant increase in tree weta. Tree weta are a favoured food of ship rats and when relieved of predation pressure, numbers flourished on our sites.

A third set of sites was subject to continuous stoat control. Over 900ha, approximately 160 stoat traps (DOC 150) were baited with either rabbit meat or eggs and checked regularly. There is concern that by removing the predators, their prey species (rodents) may increase

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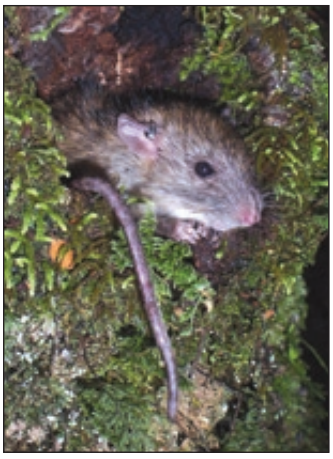

Keeping tabs: A ship rat, above left, and a possum, above, both of which have tags in their ears having been live-trapped and released as part of the programme to estimate population density.

A positive impact on the sites where rat-control work was carried out was the increase in the tree weta population. Tree weta, pictured at right in a "weta house" in the Kaimai, are a favoured food of ship rats.

in numbers; our study results did not show this effect. We suspect that the large home range size of stoats means that stoat populations in these forests are not reaching high enough densities to have an impact on the fast-breeding rodent populations.

Within a single system or site, there are likely to be multiple threats and multiple conservation assets. Understanding the response to pest control over the entire system is becoming increasingly important in order to reduce the possibility of unintended consequences or "perverse outcomes". Our research has helped quantify such responses. The next step is to use our data to build a computer model of the ecosystem, enabling us to predict the consequences of different pest control options both for the pests themselves, and for native biodiversity.

This work was funded by the foundation for Research, Science and Technology; Contract C09X0505 to Landcare Research with support from the Department of Conservation. All work was carried out with DOC consents and permits, iwi support, MOH permits and with Animal Ethics (AEC 06/03/02) approval.

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New programme controls pests and builds community understanding

Hawke's Bay produces quality and quantity in many primary products – sheep, beef, wine, stone and pip fruit being just some.

However, for many people who visit Hawke's Bay and experience its ambience, they see very little of the large-scale rural pest programmes that reduce the impacts of pests on these industries and the region's biodiversity.

This is likely to change with a new pest programme that has been initiated by Hawke's Bay Regional Council. The Hawke's Bay Urban Biodiversity (HuB) programme aims to reduce the impacts of common pests such as possums in urban and semi-urban areas on amenity and biodiversity values. It will also help the council to connect more broadly with the urban community on pest-related issues, and help urban people to see the benefits of pest management. Two urban programmes are under way – one was carried out across inner-city Napier Hill from February to June 2009 and is now in a homeowner maintenance phase, while the other is just getting under way in the rural margins of Havelock North.

The HuB programme depends on the development of solid partnerships with other organisations to achieve the programme's aims. We have added a partnership with the local Society for the Prevention of Cruelty to Animals for their staff to capture feral cats in key urban biodiversity areas. Territorial local authorities (TLAs) are also closely involved in HuB initiatives in their area, particularly in their parks and reserves. Working together with Napier City Council was an important part of the urban biodiversity programme on Napier Hill.

We need to remember that pest control is done to achieve certain outcomes, not as an end in itself. It is important to understand how programmes contribute to that outcome and whether or not they are delivering what is expected. Bird monitoring is being done on Napier Hill to see if the pest control has led to increased bird numbers. The first year's results have shown significant increases in some native species such as tui and good increases across a range of native and exotic bird species. Other surveys will be used to get feedback on the urban communities' views of the HuB programme.

As well as killing possums and subsequently increasing bird populations, such as the tui, above, the Hawke's Bay Urban Biodiversity programme helps to build solid partnerships with the community and other organisations for positive biodiversity outcomes.

To get a successful biodiversity outcome, we also recognise that pest control is often only one (albeit, an important) part of what may need to happen. Habitat revegetation and having remnant bush ecological corridors linked to urban pest programmes are also key elements.

Communication is vital – with residents, councils and partners. When a council needs to deliver a safe and effective toxin/trapping programme in a built-up urban area, communication is at the core of the programme. For example, Napier Hill has 2700 properties in its 350ha operational area, of which 400 property owners agreed to have control done on their land.

Communication also helps to build urban community understanding of, and support for, pest management programmes in a broader sense – so it is vital that people know about the success and benefits of each HuB programme. Letterbox flyers, signage at key public areas, ratepayer interviews for flyers and community

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newspapers, staff interviews on local television, one-to-one discussions between contractors and ratepayers in the operational area, and working with TLAs – these are all valuable communication opportunities.

At first glance, HuB appears to be about killing possums and bringing back birds into urban areas, and increasing bird numbers is certainly an important outcome. More fundamentally, however, it is about combining that with the opportunity to strengthen the understanding and support our urban communities have for pest management activities.

Ultimately, the long-term ability to use toxins and traps to benefit NZ's agricultural exports and protect its unique biodiversity depends to a large degree on urban people understanding why pest control is necessary and what it achieves. This is important in a society that is increasingly averse to chemical use, that increasingly faces more boisecurity risks as a result of the highly interconnected world we live in, and the need for effective and safe management of those biosecurity risks.

More information about the HuB programme can be found at http://www.hbrc.govt.nz/WhatWeDo/Pests/Animals/Possum/UrbanPossumControl/tabid/1078/Default.aspx

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New technologies for stoat control

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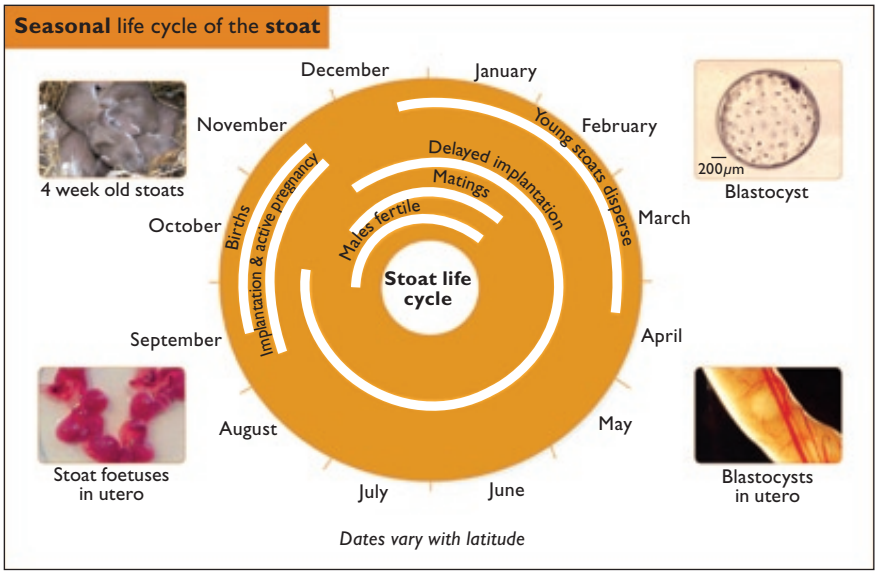
New technologies to control stoats are urgently required, as these pests are a major threat to native wildlife in New Zealand, and are implicated in the decline of many iconic bird species such as kiwi, blue duck, yellowhead and kaka. Currently stoat control relies heavily on labour-intensive trapping. Eggs poisoned with 1080 have been used in the past to kill stoats but there are no registered stoat-specific toxins. However, new toxins and fertility control agents that target the unique physiological and reproductive traits that may well be the stoat's "Achilles heel" are under investigation by Landcare Research scientists.



Stoats occur widely and are highly effective predators that live life in the fast lane. They have a very rapid metabolism and generally live only one to two years. Intensive trapping can reduce stoat populations, however, they have a very high reproductive rate and an unusual breeding strategy that makes them difficult to control. Female stoats can mate as early as three to five weeks of age while still unweaned (before they open their eyes or have fur), and carry embryos in suspended animation for nine to ten months. In the following spring, if conditions are right, the embryos reactivate and six to twelve young are born four weeks later. Large litter sizes mean that stoat populations can grow rapidly when food is plentiful, and that a single pregnant female may potentially carry a viable breeding population of stoats to any island or patch of bush she colonises.

Landcare Research scientists have been targeting some of the unusual aspects of stoat physiology that may allow the development of novel, humane, and potentially species-specific methods for controlling their populations. Brian Hopkins leads one line of research that is developing a new species-selective toxin, i.e. one that is lethal to stoats but non-toxic to non-target species. He recently demonstrated "proof of concept" in studies with captive stoats, with intravenous injection of the toxin killing them. When tested in endothelial cell lines in the laboratory, the toxin killed cells from stoats but did not affect the same cell type from non-target species such as dogs, cats, rats and mice. Brian is now seeking to synthesise the toxin cost-effectively and to optimise its structure, so that it is suitable for oral delivery in baits using technologies currently being developed elsewhere for the oral delivery of small proteins, peptides and vaccines.

I lead a second research team that is seeking to disrupt the breeding cycle of stoats. Their large litter size, short lifespan and unusual breeding cycle make them excellent candidates for fertility control, and modelling studies by Nigel Barlow and Mandy Barron, previously of AgResearch, indicate that it could be as effective as trapping for suppressing stoat populations. I am investigating several aspects of their reproduction, including using a vaccine that targets the zona pellucida (the coat surrounding the egg) and prevents fertilisation. Injection with this vaccine halved the number of eggs produced by treated stoats (4.0 ± 1.3) compared with the number produced by control animals (8.3 ± 1.7). However, the window for disrupting fertilisation in stoats is very short (2–3 weeks) and further work is required to develop an effective bait for delivery of the vaccine.

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I am also evaluating two other agents for their effectiveness in and palatability to stoats and their potential environmental and non-target impacts. Both are orally active chemicals that could be used over a longer part of the stoat's breeding cycle. The first is a toxin targeting hormones that support the embryo and which are likely to disrupt embryonic development anytime during pregnancy. The second is a chemosterilant that, in rats and mice, destroys eggs in their ovaries during early development. As the number of eggs in an ovary is set before birth, the chemosterilant causes premature ovarian failure (menopause) and sterility. It can be administered to adult females at any stage during their breeding cycle.

Effective species-selective methods for controlling stoats with reduced non-target effects and fewer adverse environmental impacts are likely to be a highly beneficial addition to the control toolbox to reduce levels of predation of valued native animals.

This work was supported by the Foundation for Research, Science and Technology, Landcare Research and the Department of Conservation.

The stoat, a highly effective predator for which Landcare Research is investigating species-selective control methods.

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Animal control

Hare and tortoise: Combining toxins for one-hit ground control of possums

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Aerially sowing 1080 baits to control possums is not permitted in some forested water-supply catchments. This leaves ground-based trapping or poisoning as the only practical alternatives. Getting a good kill of possums with trapping is expensive as it requires several visits to clear traps, whereas hand-laying toxic baits normally requires only one or two visits.

Toxins can be fast or slow acting. Fast-acting toxins, such as cyanide, kill possums quickly but because their effect is so rapid some possums become ill before eating a lethal dose, and survive to become wary of the bait used. Slow-acting toxins, such as anticoagulants and cholecalciferol, are less detectable by possums and are less likely to cause bait aversion. The practical downside with slow-acting toxins, when pest densities are high, is that large and expensive amounts of bait are required to ensure hungry animals leave some bait for less avid feeders. This downside is eliminated when most of the possums have already been killed using a different technique.

Together with colleagues I have looked at whether possum populations reduced with a fast-acting toxin could be eliminated effectively and affordably with immediate follow-up using a slow-acting toxin. The trial was conducted in four contiguous forest blocks alongside the Kumara Reservoir in 2008. Two blocks were poisoned first with twice-prefed cyanide paste (Cyanara®) and then with 100g of cholecalciferol (Decal ® cereal pellets) placed in pots 20m apart along bait lines 100m apart, and two blocks received the same treatments on bait lines 200m apart. Leghold trapping on Residual Trap Catch Index (RTCI) lines, radiotelemetry, and chew card interference on Chew Track Card Index (CTCI) lines were used to monitor the outcome.

The cyanide paste killed 79% of the radio-tagged possums, with no difference between blocks with 100m or 200m line spacings and very similar reductions in RTCI and CTCI (see table). Cholecalciferol pellets killed four of the five surviving radio-collared possums. No possums were subsequently trapped but chew cards detected some survivors at seven sites. For both methods combined, there was a 96% kill of radio-collared possums, a 100% reduction in RTCI, and a 90% reduction in CTCI activity. After baiting with cholecalciferol, CTCI detected two foci of possums on a single line in the blocks with lines spaced 100m apart, compared with five foci in the blocks with lines spaced 200m apart. The best overall reduction (97%) in possums was in one of the 100m spaced blocks.

Of the 27 radio-tagged possums killed with cyanide, 22 (81%) were found beside baits along with 508 non-collared possums. Assuming the same mortality between collared and uncollared possums, this

	100-m spacing	200-m spacing	All
Radio-collared possums			
% kill cyanide	80% (15)	79% (19)	79% (34)
% kill cholecalciferol	100% (1)	75% (4)	80% (5)
% kill both	100% (16)	96% (23)	98% (39)
Possum trapping (RTCI)			
% reduction cyanide	80%	81%	80%
% reduction cholecalciferol	100%	100%	100%
% reduction both	100%	100%	100%
Possum Chew Card (CTCI)			
% reduction cyanide	74%	79%	76%
% reduction cholecalciferol	91%	30%	60%
% reduction both	95%	86%	90%
Rat Chew Card (CTCI)			
% reduction cyanide	3%	increase	increase
% reduction cholecalciferol	91%	93%	93%
% reduction both	93%	88%	91%

Table. *Reduction in possum and rat numbers after cyanide and cholecalciferol poisoning, for two bait-line spacings. The reductions in CTCI were calculated from Poisson-transformed data. Number of possums killed shown in brackets.*

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Looking across Lake Kumara towards the study area

indicated that about 650 were killed across all four blocks. Allowing for 20% survival, the pre-control population appeared to average about 820 possums, a relatively low density (by West Coast standards) of c. 1.5 possums/ha.

Cyanide paste had no discernible effect on rat CTCIs, with interference recorded on almost every card in all blocks. In comparison, cholecalciferol pellets reduced rat interference levels by 91% overall and by up to 97% in one of the 100m-spacing blocks.

Overall, these results indicate that using slow-acting toxins in a different bait immediately after an operation using a fast-acting toxin is successful in mopping up surviving possums. The small non-significant difference in the total reductions of possums at the two line spacings indicate that possum survival in the 100m blocks was unlikely to reflect a non-encounter with baits, but rather that about 20% of possums survive an encounter with cyanide paste. Using an intermediate bait line spacing of 150m rather than the 100m and 200m line spacings trialled appears unlikely to reduce the efficacy of possum or rat control in forest habitats.

The experimental control programme required six visits – two to pre-feed the cyanide paste, two to lay and remove the cyanide, and two to lay and remove the cholecalciferol pellets. At an average spacing of 150 m between lines, this cost about $75 per hectare, which could be reduced by perhaps a third if one pre-feed and the bait removal visits were dropped. The cost of the pre-feed and cyanide paste was minor but even at the low application rate of 300g/ha the cholecalciferol bait cost $6 per hectare. In comparison, an aerial 1080 operation a few months previously in the surrounding area cost $36 per hectare. Thus, in flat forest readily accessible from road edges, equivalent control can be achieved using ground-based methods, albeit at a substantially higher cost.

This work was done under contract to the Animal Health Board.

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Biosecurity sector notes

Registration of alternatives to 1080 progress

Alternatives to 1080 being developed by Lincoln University, Connovation and Pest Tech Ltd in collaboration with Department of Conservaton and Animal Health Board are getting closer to becoming available for use. Charles Eason of the Faculty of Agriculture and Life Sciences, Lincoln University, reports.

Zinc Phosphide registration advances

Following the filing of dossiers with ERMA-NZ last year, meetings were than held October- December 2009 with ERMA officials. Detailed responses have been provided to ERMA to questions raised on dossiers.

Responses were provided to ERMA with regard to public submissions and requests for additional technical information in response to the filing of our HS1 dossiers. The first set of responses exceeded over 30 pages of additional information. A further series of questions were received in October.

Follow-up meetings were completed in November to address any further requirements relating to these submissions.

A further set of queries were received in December and responses to these questions were provided in January 2010.

PAPP registration progresses

The registration of paraaminopropiophenone (PAPP) has accelerated. Recent progress, following field trials in 2008 (stoats) and June 2009 (cats), has been rapid. PAPP dossiers for chemistry and manufacturing, toxicology, efficacy, ecotoxicology and non-target impacts, and welfare were filed with the NZFSA in 2008 and ERMA in 2009.

In December 2009 a critically important milestone was reached in the registration process namely the "publicly notifiable stage" on the ERMA-NZ website. Submissions closed mid-February.

Work experience sought

Hi, my name is Caroline Sloan. I am a second year California university student majoring in biology and planning on attending Veterinary School.

I am looking for a volunteer research job in New Zealand during my summer school break which is from May 1 to mid-August, 2010.

I can pay all my travel and living expenses and do not need payment for my work. I would prefer assisting a researcher who is working with wildlife as that is my interest .

If you have any work please contact me at dsloan@puretecbio.com

Thanks

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BIOSECURITY NEW ZEALAND

Hadda beetles under watchful eyes

In January MAF Biosecurity New Zealand (MAFBNZ) found Hadda beetles in Dove-Myer Robinson Park, along Tamaki Drive and in the Auckland Domain in Auckland. Hadda beetles are unwanted organisms in New Zealand.

The beetle was first discovered in Dove-Myer Robinson Park in Parnell, Auckland by an entomologist with close associations with MAFBNZ. He found it resting on a non-host plant and did not recognise it as a New Zealand beetle and reported the find to MAFBNZ Investigation and Diagnostic Centre at Tamaki.

David Yard, MAF Biosecurity New Zealand Response Manager, says the beetle species is found throughout Asia and the Pacific region and is a foliage feeder which cause distinctive damage to foliage.

"Both adults and larvae feed on solanaceous crops including potatoes, tomatoes, and aubergines. The leaf surface is scraped away leaving irregular windows or parallel strips. This feeding damage gives leaves a distinctive "lace-like" appearance which is quite visible."

To date it has been found feeding only on black nightshade (*Solanum nigrum*), a very common weed species in the Auckland area.

Contractors carried out a controlled spray programme at Dove-Myer Robinson Park and the Auckland Domain where they hand-sprayed individual plants on which the beetle has been feeding with a commonly used insecticide.

"A surveillance programme is also planned to determine the extent of the infestation. While there are no human health concerns, the public are encouraged not to enter these areas until the signage and cordons are removed", Mr Yard said.

Hadda beetle larvae are about 7mm long, and pale yellow in colour with black spiny hairs. The adults are 7–10mm in size and yellow/ orange coloured with around 26 black spots on their backs.

For more information on Hadda beetles, go to www.biosecurity.govt.nz/pests/hadda-beetle

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Hadda beetle leaf damage, above and the distinctive feeding pattern, right.

Larvae of Hadda beetle, (*Epilachna vigintioctopunctata*).

Hadda beetle. Note the two square-shaped spots in the centre of the back.

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BIOSECURITY NEW ZEALAND **News**

Future of pest management project – developing solutions for the next 25 years

In 2008 MAFBNZ commissioned an independent company to write a "think piece" on the future of pest management in New Zealand to stimulate discussion on the topic. About the same time regional councils commissioned a similar piece of work.

Both the regional council and MAFBNZ reports found that New Zealand's pest management system stacked up well compared with other jurisdictions. At the same time both suggested that new policies and approaches would be needed to position the pest management sector to meet future challenges.

Challenges faced by the sector include: an increasing pest burden, risks to ongoing availability of physical control tools, lack of clarity around roles and responsibilities of those involved in pest management, the need for more collective action between organisations and individuals, and lack of flexibility in some aspects of the Biosecurity Act 1993.

The Future of Pest Management Project was set up to address these issues. Its brief is to design improvements to pest management systems that will deliver what New Zealand as a nation needs for the next 25 years.

More specifically, the project aims to develop ways to:

- Enable more effective leadership and collective action across the sector;
- Clarify definition of roles and accountabilities;
- Improve legislative tools;
- Implement performance measurement to drive investment to areas which deliver "value for money"; and
- Provide a central repository or "toolbox" for practitioners to access information on physical control tools and best practice.

In 2009 the project team worked on developing possible solutions for these critical areas. Organisations with an interest in pest management at a regional and national level are represented on the project team including: Department of Conservation; Land Information New Zealand; and regional councils. A tangata whenua focus group has been convened to provide Maori perspectives and input to the project.

A draft national plan of action is being developed for consideration by central and regional chief executives. This will be released for stakeholder consultation mid-2010. Interested parties will be invited to provide feedback through a combination of workshops, hui and written submissions. This feedback will inform the preparation of a final action plan and support processes to improve the law.

For more information see the MAFBNZ website www.biosecurity.govt.nz/pests/surv-mgmt/mgmt/future-project

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