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Protect

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

Autumn 2009

Magazine of the New Zealand Biosecurity Institute

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Editor's Note

I hope everyone had a great Christmas and New Year, although it feels like it was months ago. Summer really seems to have flown the coop and winter is knocking on the door. Although most people around New Zealand will say what summer? It was so short and fleeting and according to the old-timers it's going to be a long hard winter.

This is my first time as editor of *Protect*, I hope you enjoy the articles. Any improvements please let me know. I want you to own this magazine as it is your voice, you are the people who are concerned and involved with biosecurity issues. No matter what your job is, your ideas and thoughts are important.

I am introducing a new column "Burning Issues". This is your soapbox, if you have an issue that is bugging you let me know – send me the details. We will publish it in the next issue of *Protect*. Then what I would like is people to debate the issue, send me your thoughts and I will collate the answers and publish them in the next issue. This month I asked Randall Milne to tell me about his burning issue. Check it out and send your responses to me, not Randall.

This month I have focused on islands, both offshore and mainland. It is amazing the diversity and similarities that occur with pest animals, plants and biosecurity on islands. So sit down and read this issue of *Protect* and let me know what you think.

Lynne Huggins
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NZBI news

News from the Executive

Kia ora and seasons greetings from the Executive!

I trust you all have had an enjoyable summer and are looking forward to what the change to autumn means. Usually the smoko room conversation turns to "the roar", duck shooting, and other outdoor adventures.

It is great living in a country where we have so much choice in our pursuit of the great outdoors. And it's in this environment where we enjoy what we, as biosecurity folk, have protected. In a way biosecurity is more than killing pests, stopping or cleaning risk items, managing long-term problems, making "aware", researching, surveillance, and investigating. It is also about taking pleasure in New Zealand's natural heritage. For it's when we are in our bush, on our rivers, or along our beaches that we can be inspired, motivated or just reminded of why we seek to protect and preserve.

The Executive is having a phone conference in early April and any new developments will be communicated through the next issue of *Protect*.

NETS2009

The organising committee has been busy over the summer period putting the finishing touches on the programme, sorting field trips and is now seeking sponsors. NETS2009 is being held in Queenstown, from October 14 to 16. So start preparing now for another fantastic gathering of biosecurity knowledge.

New members

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

John (JD) Dodgson
Lou Hunt
Don McLean
Cheryl Krull
John Sanson
Terry Charles

Take care.

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

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NZBI news

News from the branches

Auckland/Northland

A branch meeting was held at the Unitec Mt Albert campus, Carrington Road, Auckland on Thursday, March 12.

After the formalities were over we had four very informative talks. Professor Charles Eason and Lyn Nicholls gave a presentation on what's new from Connovation products and research development. The talk focused on vertebrate pest control. Products discussed included cyanide and trials with cyanide pellets in Dama and Bennett's wallabies with 2009 registration for control of wallabies.

A new product, Para-aminopropiophenone (PAPP), effective for control of stoats and feral cats is advancing along the registration and approval process. RatAbate contains diphacinone, a first generation anticoagulant which is not persistent and does not contaminate food webs, yet provides effective control of rodents. A zinc phosphide product is being developed for possums, rats and mice, and sodium nitrite for pigs.

Shaun McClaren from NZ Biosecure spoke on the mosquito surveillance control programme at the Devonport Naval Base. There are three types of mosquito traps used to monitor for new mosquito species arriving in the country. The ovi trap is for eggs; the tyre trap for larvae; and a light trap using carbon dioxide and octenol to attract adult mosquitoes. The traps are checked weekly with mosquito larvae and adults identified and eggs reared for identification. There are a number of mosquito species present in Australia and the Pacific Islands which carry a range of diseases. These diseases include Ross River virus, Japanese encephalitis, dengue, malaria, yellow fever and filarisis.

Warren Agnew talked about a new trap he is developing and about how the Black Trakka tunnels can be used to identify many different animal species and their sex from footprints. The new traps, which should be on the market in 2010, apply the toxin to the back of the animal as it goes through a tunnel. The trap is designed to control pests such as mustelids, rodents and hedgehogs and is activated by sensors as the animal walks through the tunnel. The toxin is delivered with a propellant delivered from a gas cylinder.

Dan Blanchon from Unitec gave a talk on horsetails or *Equisetum* species. All *Equisetum* species are listed on the National Pest Plant Accord as plants prohibited from sale, propagation and distribution within New Zealand. Florists import a range of plant material into the country including horsetail which is required to be devitalised to prevent the material from being propagated. Glyphosate is applied to the plant material in the country of origin before its export to NZ. Dan suspects not all plant material imported into the country is treated correctly as he has found some material can be propagated. Dan is carrying out devitalisation trials with glyphosate and other chemicals. Horsetail species are resistant to most herbicides and spread by extensive rhizome systems, they can also spread by

Photo: Auckland Regional Council

All* Equisetum *species are listed on the National Pest Plant Accord as plants prohibited from sale, propagation and distribution within New Zealand.

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NZBI News from the Branches Continued

spores and can form pure stands in a wide range of damp habitats.

The meeting and talks concluded with lunch followed by a field trip to Oakley Creek which runs at the back of the Unitec grounds. This creek has been the site of great restoration efforts by the community group, Friends of the Oakley Creek.

Right: Wendy John from Friends of the Oakley Creek talking to branch members about the restoration work the group is doing.

Greg Hoskins
Executive Member
Northland-Auckland Branch
greg.hoskins@arc.govt.nz

Canterbury

The Canterbury branch has been pretty quiet since our 2008 Christmas get-together.

Branch members can keep Friday, May 24 in the back of their minds for a potential get together. The activity, time, venue and date are to be confirmed closer to the time. Any ideas or suggestions please let Hugh Gourlay know.

Members will be able to check out local branch activities on the new and improved NZBI website calendar now the website has been launched.

Sorry that I don't have anything further to report.

Gemma Bradfield
Executive Member
Canterbury Branch

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NZBI news

Biosecurity personnel profile: Sharon Trainor

Role: Ranger: Quarantine and Logistics
Southern Islands Area, based in Invercargill

Logistics and biosecurity for the Codfish Island operation are managed by DOC Southern Islands Ranger Sharon Trainor. Sharon works closely with Gilly Adam who manages the Southern Islands Area quarantine store to ensure that all the standards laid down in the operating procedures both for servicing Codfish Island and for operating the store are maintained. While both Sharon and Gilly have a range of duties outside their quarantine and logistics roles, quarantine is the priority. Everything else comes second to making sure that the risks posed by research and management visitors to the island are minimised.

Sharon Trainor at work in DOC's Southern Islands Area quarantine store checking clothing for an island expedition.

Sharon joined DOC in 1999, initially working part time at the store, cleaning out the "fish bins" used to transport everything to the islands and being general dogsbody. As the quarantine systems have developed and standards have increased, so has Sharon's role in protecting the islands. Coming from a very diverse background and raising a family before getting back into the workforce where she has worked in the hospitality industry and then on the chain at a freezing works, working for a government department was quite a change, but Sharon adapted to it quickly and was soon an integral part of the team .

Perhaps due to this diverse experience, Sharon has an excellent way of dealing with the people she interacts with who are as diverse as student volunteers to the prime minister. Regardless of who they are, Sharon makes sure they maintain the same standards – there's no "quick quarantines" for Sharon – protecting the islands comes first but she does it in such a way that people are happy to comply.

Although Sharon's background is not in conservation – in fact she would have described herself as "an indoors chick" – having now been exposed to the outdoors she takes every opportunity to get involved in the field. With a supervisor who believes it is easier to be enthusiastic about a place if you have been there, Sharon has visited both the Auckland and Campbell islands as the department's representative on a cruise ship as well as assisting with the sea lion project on Enderby Island at the Auckland Islands.

Sharon has also taken on the monitoring of the South Georgian diving petrels on Codfish, which means that she gets there at least once a year which keeps her in touch with the staff on the island and the day-to-day running of the place.

As part of DOC's national quarantine process, staff are brought in from different locations to audit the quarantine facilities and processes at each of the areas that service offshore islands. Sharon has been involved in auditing the facilities around Northland and looks forward to visiting others in the future. "It gives an opportunity to not only share what we have learnt to help improve their processes, but to learn from other people as well. Quarantine is an ongoing process and you can always do it better. The limiting factors are resources and what is practical."

Sharon's recent focus has been on keeping Codfish Island running while ensuring that the quarantine standards are maintained – this has meant checking the gear for 20 people or more a week – everyone has to be up to the same standard: if it is not clean, it does not travel!

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NZBI News

NZBI's online presence boosted with launch of revamped website

www.biosecurity.org.nz

At the AGM at NETS2008 it was decided to give the go-ahead to a proposal to redevelop the NZBI website. The Executive appointed a website development team comprising website manager David Brittain of Kiwicare Corporation Ltd, NZBI National Secretary Louise Cook of AHB, NZBI National Treasurer Helen Braithwaite of DOC and Gemma Bradfield of ECan.

Quotations were obtained from several web design companies and E2 Media (www.e2-media.co.nz) was selected to assist in the redevelopment.

The new website was launched on April 6. There are several new features on the site which hopefully will make it more useful to members and non-members alike. It is hoped the website will encourage members to participate in Institute events, both locally and nationally. Details of events will be posted on the website 'Calendar' and reports of the "fun times" members have at events will be posted in the 'News' section.

If you or your organisation want to advertise employment opportunities or courses related to biosecurity, contact Louise Cook (cookl@ahb.org.nz) or they can be posted in the 'Jobs and Education' section. This service is free.

It is also expected that the new "search-engine friendly" site will increase the profile of the Institute by returning better results for search terms relevant to biosecuity, projecting a professional image of the Institute and providing more comprehensive and useful information on biosecurity issues.

The consequent increased profile of the Institute will encourage more people with an interest in biosecurity and environmental issues around New Zealand to join the Institute and make it a forum for discussion and dissemination of information.

Applications for membership, registration at NETS, awards and grants will now be able to be made online and in the near future payment for subs and registrations will be accepted on the site.

A photo gallery can be found under the 'NETS – Past Conferences' section. This will not only collect photos from NETS but also photos that would be useful to other members. Perhaps you have some good quality photos that you would like to share with members; photos of New Zealand or of pests or weeds etc. If so, please send them to Website Manager David Brittain (contact details below or on the site).

Members can log into a section of the website which provides access to an archive of past and present *Protect* newsletters, an interactive forum on biosecurity or any other issues of interest to members, NETS abstracts, other publications, minutes of Executive meetings, national and branch reports and other useful information.

If you are a member you should have received your log-in details. If you have any queries please contact David Brittain (David.Brittain@kiwicare.co.nz).

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NZBI News

Call for papers, posters for NETS2009

Papers are now being called for the New Zealand Biosecurity Institute's annual conference to be held in Queenstown, October 14-16, 2009, at the Rydges Hotel.

The theme for NETS09 is "Remarkable Changes". This recognises both the remarkable location of Queenstown, and that the seminar was last held there 30 years ago, under the auspices of the Institute of Noxious Plants Officers. The event will take a retrospective look at pest management, as well as discuss what biosecurity issues we may face over the coming 30 years.

The conference will feature biosecurity issues relevant to the southern South Island such as rabbits, didymo, wilding trees, and pest eradications from islands. Papers covering topics relevant to current biosecurity and pest management issues are also welcome.

We intend to strongly promote use of posters at this conference. This will enable a wider range of topics to be presented and provide opportunities for greater informal discussion and exchange of information over the three days.

To encourage student participation, any tertiary student who presents a paper or poster at the conference will receive a 50% discount off the conference registration.

Abstracts for papers and posters must be received by the Programme Organiser by May 15, 2009.

Richard Bowman
Programme Organiser NETS 09
Email: richard.bowman@es.govt.nz
Phone: 03 211 5115

Burning Issues

Five years too short for a Regional Pest Management Strategy

Randall Milne, Environment Southland

Every five years, regional councils and unitary authorities are legally bound to review their pest management strategies under the Biosecurity Act. While it can be worthwhile to assess the state of pests in a region every five years, it is also costly in terms of time and money to carry out the consultation and cost-benefit analysis etc.,associated with the review. It also doesn't leave much time to carry out pest programmes before they are up for scrutiny again.

Five years is inconsistent with other plans these organisations work with under the Resource Management Act. Perhaps it's time to align the two pieces of legislation and bring pest management into step with the other activities of regional councils and unitary authorities.

Send any thoughts you have on the suitability of the five-yearly reviews of pest management strategies to *Protect* Editor Lynne Huggins, email: folstergardens@xtra.co.nz

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NZBI News

The Council of Australasian Weed Societies announces its award for the

2009 Most Weed-Wise Nursery in New Zealand

This award aims to promote awareness about invasive garden plants. Many serious weeds were originally introduced as garden ornamentals. The award gives positive publicity to retail nurseries that do not sell invasive garden plants and which support appropriate labelling schemes and education of customers.

Anyone can nominate a retail nursery or garden centre for the award – nursery owners or staff can nominate themselves. Details of the selection criteria and instructions for nomination can be found on **www.nzpps.org/awards.php#WWN**.

Nominations must be with
The Secretary of the New Zealand Plant Protection Society,
PO Box 8363, Havelock North, by 30 April 2009.

Global Biosecurity 2010: safeguarding agriculture & the environment

Global Biosecurity 2010: safeguarding agriculture and the environment is being organised collaboratively between the CRC for National Plant Biosecurity, Plant Health Australia, Invasive Animals CRC and Australian Biosecurity CRC for Emerging and Infectious Diseases.

Planning for the conference is under way and the programme will be developed in the new year, including a call for abstracts.

Biosecurity has become a major economic issue of concern to international governments and to agricultural and environmental industries. It has emerged as a relatively new field of concern for researchers across a range of disciplines, spanning both the traditional sciences (such as pathology) and the social sciences (including economics, risk analysis and risk communication), and carries a range of concerns that are unique to the area. Despite its wide impact and complexities, there have, to date, been limited opportunities for scientific exchange among researchers, and with end-users around the central theme of biosecurity.

For example, Global Biosecurity 2010 will focus on current research themes and policy initiatives in agricultural and environmental biosecurity. Its aim is to provide a forum for biosecurity researchers and stakeholders to:

- Workshop, network and exchange knowledge on agricultural and environmental biosecurity
- Facilitate engagement and cross-fertilisation of ideas between researchers and their end-users (industry, regulators and other end-users), and
- Build cross-disciplinary networks across all biosecurity related disciplines.

Global Biosecurity 2010 is to be held at the Brisbane Convention and Exhibition Centre February 28 to March 3, 2010. For further information email biosecurity@con-sol.com

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Island biosecurity

Taking steps to minimise the biosecurity risk to Codfish Island

Pete Clelland

Everybody has heard the fantastic news about the kakapo having their best breeding season ever this year on Codfish Island/ Whenua Hou. What few people know about are the measures taken to protect both the birds and their island home from everything from rodents and invertebrates to alien plants and pathogens.

It was a calculated risk to put all the female kakapo in the world on one island – normally they are divided between at least two sites to split the risk. Kakapo breeding is triggered by very good rimu fruiting. It looked like being a very good rimu-fruiting season this summer, a prediction which has proved correct, and it was decided that the likely gain was worth the risk. As the saying goes about "putting all your eggs in one basket", when you have to do it you make sure they are wrapped in cotton wool. The cotton wool in this case was DOC Southern Islands Area's biosecurity measures.

Packing up: staff check equipment in DOC's quarantine store in preparation for transport to Codfish Island.

As well as servicing Codfish Island, the Southern Islands team also acts as a gateway to the very valuable Subantarctic Island Nature Reserves, comprising Campbell, Aucklands, Snares, Bounties and Antipodes islands. The size of some of the expeditions which go to the subantarctic, along with the frequency of the Codfish servicing – fortnightly most of the time but bi- or tri-weekly during the breeding season, means that a dedicated quarantine store is required. It is still referred to as quarantine rather than biosecurity since it is a term more people can relate to – biosecurity is often taken as the big-picture stuff not whether people have cleaned their boots or not. The operational part of the store is basically split into two parts: the "dirty store" which receives all the dirty equipment that has not been checked and cleaned, as well as the workshop and a couple of separate storerooms for outboard motors etc; and the "clean store" into which only gear that is ready to go straight to the islands is kept and where the checking of individuals clothing etc., is done.

Most of the quarantine measures are the same for people travelling to any of the islands. All equipment is delivered to the dirty store where it is inspected and if needed, cleaned by the expedition teams, prior to being moved through to the clean store. This means that the equipment can be sent down well in advance to avoid a mad rush just before the trip, but this depends on how well the departing personal have cleaned their gear before sending it down. Ideally by the time the trip is leaving, only personal gear needs to be cleaned.

All food is sourced from one supermarket, which packs it into fishbins and seals it immediately. The supermarket maintains specific quarantine measures – traps and glue boards which are inspected as part of the biannual quarantine audit in addition to the standard food-store quarantine requirements. A premium is paid for this service but it ensures a consistent quality control and saves significantly on staff time.

All gear going to the islands is required to be transported in pest-proof containers. After much trial and error we settled on 45 litre "stack nesta" bins, generally referred to as "fish bins", as they can carry quite a bit of gear but not too much – a 45 litre bin full of canned food is a hernia waiting to happen! For heavy items or for difficult or wet landings, we also carry 20 litre polypails – light, easy to pass along a human chain, and they float. Anything that will not fit in a fish bin has to be sealed separately – large bin liners (thick plastic bags up to 2m by 1m) can take most things. Larger things are cleaned and if appropriate, sprayed with a biocide.

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Island biosecurity

As part of the preparation for going to the islands everybody is sent a "Quarantine checklist" which they should go through as they pack and tick off each item as it goes in to their bag and then sign-off that they have cleaned and checked all their gear. When they arrive at the store the quarantine team collects their forms and goes through their gear paying particular attention to high-risk items such as socks, footwear, pockets and especially Velcro.

It is at this stage that those people going to Codfish get special attention. Along with their form they will receive two containers of biocide – all clothes including parkas etc must be washed in it to reduce the risk of taking any avian disease to the island. This includes bringing a set of clothes which have been washed in biocide to the store to change into immediately prior to travelling to the island, with their street clothes left in Invercargill for their return. As packs and gaiters have been found to be high-risk items, there are a supply of both kept on the island and all visitors transfer their clothes into a clean duffle bag at the store.

The visitors are then transported to the airport where they get on the plane/helicopter to the island. On arrival at the island all bags, food bins etc are carried into the hut where the doors and windows are closed prior to all containers being opened and checked. This gives a final opportunity to detect and catch any unwanted rodents/invertebrates. While this may seem extreme, there have been cases of rodents getting into "sealed bags/boxes", including one of a rat, when they were still present on Codfish, getting into a box inside the kakapo room and being transported to another DOC facility on the mainland – much to the surprise of the person who opened it!

For the Subantarctic, all team and personal food and equipment is checked but clothing is not biocided. Specialist equipment – gear used for handling wildlife – must be cleaned in biocide. The selective treatment is because there are up to 1400 tourists visiting the islands each year and there is little point in having much tighter controls for one group than for the others. In general, the tourists pose a lesser risk than management staff since they take significantly less gear ashore and, with a few exceptions, are less likely to have been in recent contact with other wildlife. All visitors still have to have their pockets etc., checked and all footwear is cleaned and treated with biocide before any landings. These precautions are under constant review but any process put in place has to be suitable for use with up to 100 inexperienced people at a time, on a rolling boat.

Codfish Island as seen from Stewart Island.

It is recognised that these processes are not perfect and that they rely on the personal integrity of the visitors to have cleaned and checked their gear and to have been honest on their forms. However, any process has to be practical and affordable, there is no point in having an incredibly detailed plan if it is not carried out. The biannual audit on the quarantine process is designed to highlight any areas which could be improved and to compare what is written down with what is actually done. If they differ, we either need to change what is being done to bring it up to standard, or if it is found not to be practical then the plan should be changed. Over time the plan evolves as standards can be gradually increased as people become more accepting of them and hence more willing to comply.

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Red crowned parakeet on a citron. The increasing numbers of parakeets on Raoul may have a positive impact on the reduction of some exotic species.

Island biosecurity

Controlling weeds on Raoul Is

David Havell
Auckland Conservancy
Department of Conservation

Raoul Island is a subtropical volcanic island and nature reserve midway along the Kermadec trench between New Zealand and Tongatapu. The islands and associated islets have high plant biodiversity values (Sykes, 1975) and are important for both seabirds and localised populations of tui and red crowned parakeets. Goats were removed by 1984 and rats were eradicated in 2002.

The weed programme on Raoul was initiated in response to the impact of Mysore thorn on pohutukawa forest, and later reports on the impact and spread of African olive, purple and yellow guava, mauritius hemp and shore hibiscus on Raoul and Norfolk islands (Devine 1977). The topography, isolation and volcanic nature of Raoul make it a difficult site to control weeds.

The weed programme prior to 1979 was outlined by Devine (1977) and was reviewed by West (1996). The programme has also been discussed by West (2002), and Holloran (2006).

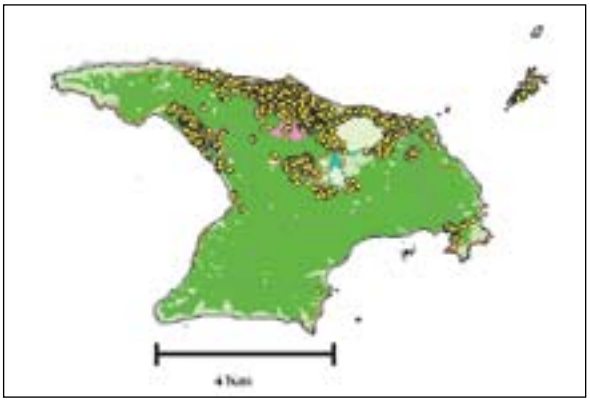

Figure 1. Map of Raoul showing weed infestations, (yellow dots). Most infestations are within search grids. Map: Briony Senior

Airplant (*Bryophyllum pinnatum*) infestation in the Denham Bay dunes.

Three approaches are used to find invasive species: grid searching, monitoring of mapped infestations, and surveillance of likely habitat in areas away from the regular grid search areas. For the control of weeds herbicide and physical control treatments are used.

Most weed management occurs within defined areas, as shown in Figure 1.

One important aspect of the weed programme is the Raoul Weed Database and GIS system. This is used to provide information on the type and location of weed infestations, the hours spent working in a site, and provides notes on how to get to a site and safety concerns. All invasive species locations are now mapped with GPS units. Work activity is regulated by earthquakes, rainfall, and volcanic events.

Raoul Island is unique in that the exotic flora is now largely confined to the old farm area, areas of previous habitation, disturbance sites and the dune systems. The weed programme has reduced many invasive species to scattered individuals or infestations. The exceptions being air plant (*Bryophyllum pinnatum*) which occupies a large patch in Denham Bay, *Alocasia brisbanensis* which is common through the Raoul forest but thought to be in decline, relic oranges in the old orchard, and historic plants such as citron and *Tibouchina* which occupy patches sometimes as large as 200m^2.

The weed control programme has largely been successful, see figures 2, 3, 4, 6. Ten species have

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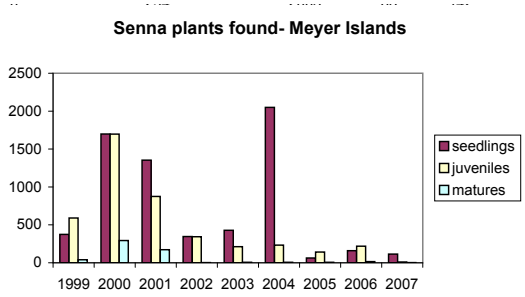
Island biosecurity



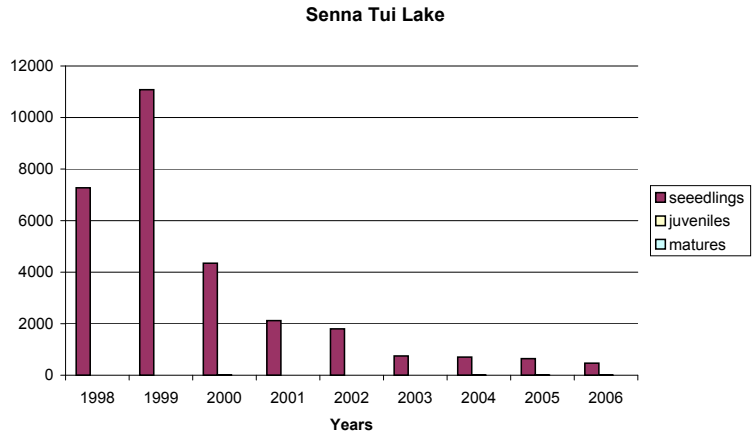


Figure 2. Changes in Senna plants found on the Meyers and around Tui Lake.

Below: Madeira vine control site.

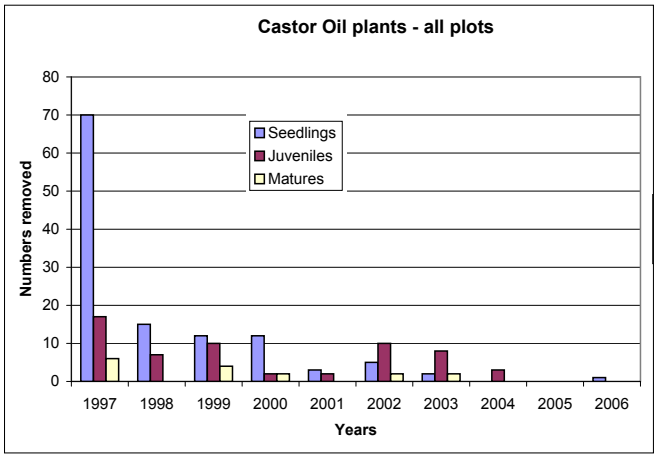


Figure 3. Total number of castor oil plants removed from Raoul Island per year.

not been found for three years, several such as Norfolk pine, tobacco and poplar have only been found in one site. In general the number of mature invasive plants has decreased over the last 10 years to the extent that a mature plant is a rare find. Only one adult mysore thorn and four purple guava adults were found in the period 2006 to 2008. Madeira vine is still a major problem although the distribution has been slightly reduced. *Selaginella* and vetch have been controlled for 10 years and still persist in one small location each, despite control efforts.

Black passion fruit, citrus and Norfolk pine seedlings have increased since the 2002 rat eradication but this may be due to increased awareness of weed species, especially in respect of Norfolk pine. Release from rat and goat grazing may be another cause of increased seedling germination.

After spending some time pulling out hundreds of citrus and Norfolk pine seedlings, the current approach is to remove plants which have reached more than

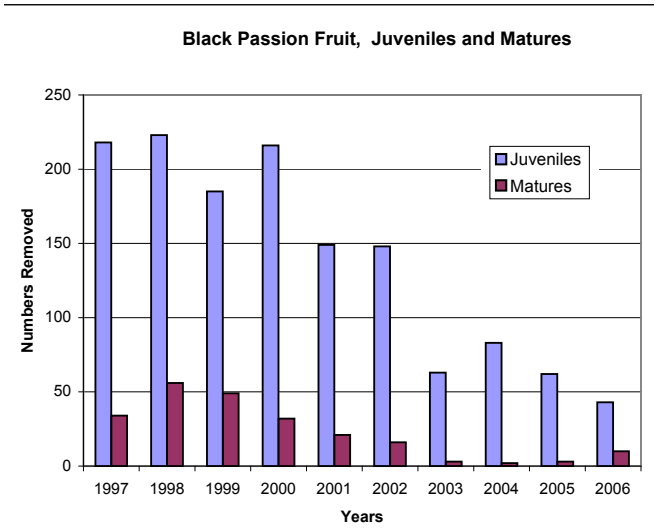


Figure 4. Numbers of passion fruit juveniles and adult plants removed from Raoul Island, 1997 to 2006.

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30cm, and to control seedlings outside the distribution of parents.

There has been some change to the species controlled. For some species such as grape and pawpaw, the threat has been evaluated as higher than previously thought, due to an expected increase in bird numbers .For others such as candlenut ,the species are unlikely to spread from their current distribution. Some historic plants may require management to reduce their local impact. New patches of potentially invasive species such as canna are removed as they appear. Exotic species discovered outside their historic distributions are also removed. Surveillance occurs as resources allow.

Biosecurity measures appear to be working although Onehunga weed has appeared in the lawn around the Met station, and vetch was discovered and removed from the Meyer Islands. There is the potential for exotics species to reinvade Raoul from the Meyer Islands, especially as control on the Meyers will be difficult.

Some seed and seedling banks have been surprisingly persistent. Norfolk pine seedlings have been found seven years after the parents have been removed. Some peach and passion fruit infestations are still active eight years after matures have been removed. Legume seed

Canna and Alocasia Woolshed road.

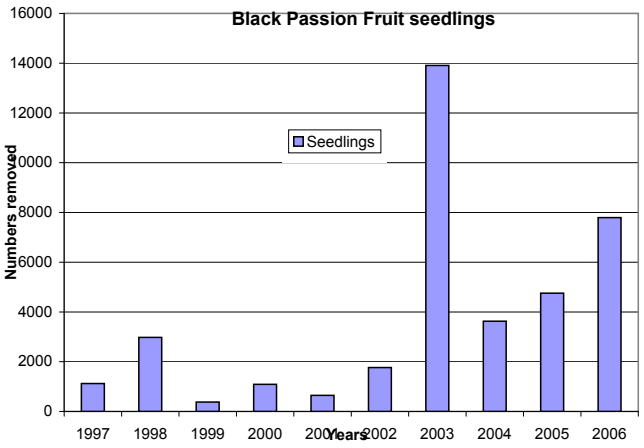

Figure 5. Passion fruit seedlings removed from Raoul. Seedling numbers have trended upwards.

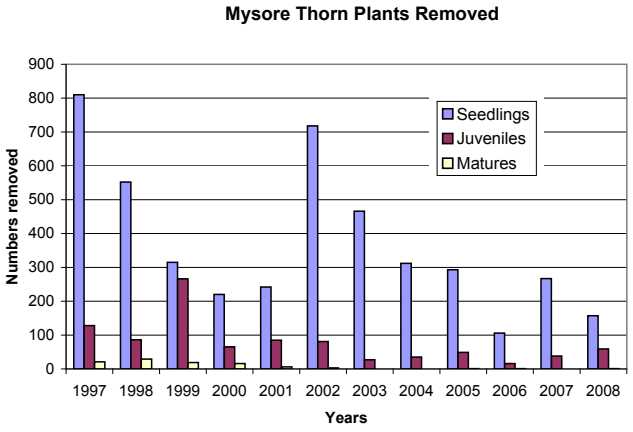

Figure 6. Mysore numbers Denham Bay.

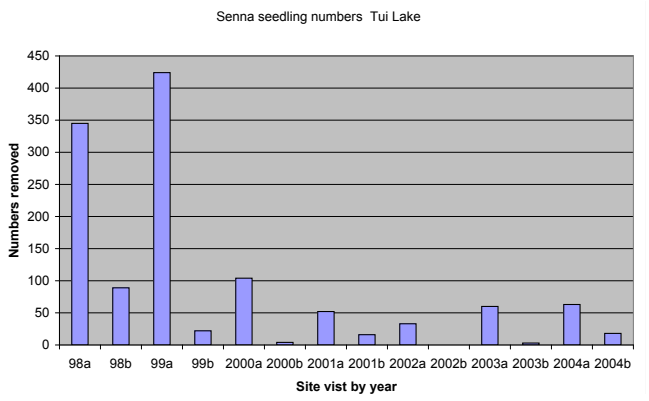

Figure 7. Senna seedling numbers in a Tui Lake infestation. The pattern of change from search to another occurs in other infestations. No mature had been found in this site for 10 years.

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banks are sometimes quiescent for several years, and the number of active senna sites has been relatively constant over the last four years. A regular pattern is for seedling numbers to decline, even if the site remains active.

The success of the weed programme is due to the dedication of the Raoul weed teams, the Warkworth Area Office and the Raoul Island programme managers. The New Zealand Defence Forces, especially the Royal New Zealand Navy, have provided much assistance. I would also like to acknowledge all those who have helped develop the weed data base and GIS system, and the volunteers and staff who have maintained and developed the programme and infrastructure.

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Island biosecurity

Regional council develops biosecurity plan to protect Hauraki Gulf islands

Jonathan Boow

The Hauraki Gulf islands contain many biodiversity values not found on the Auckland mainland, and lack many pest animal and plant species that threaten these values. The Department of Conservation administers a number of the Hauraki Gulf islands (e.g. Little Barrier, Tiritiri Matangi) and has well-established biosecurity procedures for them. However, there are a number of other islands with mixed ownership and much less stringent procedures (e.g. Great Barrier, Rakino). This, together with DOC's imminent Rangitoto/Motutapu multi-pest eradication, provides the impetus for increasing biosecurity protection in the Hauraki Gulf. The Auckland Regional Council is working with DOC to step-up protection and reduce the chance of pest incursions.

The Auckland Regional Council's Regional Pest Management Strategy 2007-2012 (RPMS) contains specific provisions addressing issues relating to the Hauraki Gulf islands. These measures include:

- enhanced pest plant control or eradication on islands and on a mainland coastal buffer zone,
- Argentine ant eradication on Great Barrier Island,
- feral goat and feral pig eradication on Waiheke Island, and
- movement control on all pest species.

The RPMS states that the ARC will develop a Hauraki Gulf Controlled Area Biosecurity Plan, which will provide an integrated framework within which the current (and any future) pest control, management or research activities will be undertaken.

This biosecurity plan has been drafted and has identified a range of actions that will bring added protection to gulf islands from biosecurity threats. These actions include:

- the development of standard operating procedures for pest detection and eradication,
- industry standards to ensure compliance with procedures,
- inspection and quality assurance programmes maintained by council,
- wharf and other associated surveillance and monitoring programmes,
- specific incursion response plans,
- signage and education programmes (see picture).

Key tasks in creating the plan have included identification and assessment of:

- risk organisms (ie declared and undeclared pests),
- risk goods (ie., those that can harbour pests),
- pest pathways,
- assessment of industry and community capability to identify and deal with problems,
- necessary administrative tools (eg memoranda of understanding),
- measures that will effectively exclude pests from gulf islands, including existing measures (local and other) and their effectiveness,
- training needs for industry and communities,
- signage and educational material.

The plan contains a range of measures to be implemented, or that have already been implemented, by the council. It also includes a range of largely voluntary measures to be implemented by others, and commitments to develop specific industry standards and memoranda of understanding. The plan is a working document rather than a compliance manual, as the need for more compliance-driven responses will only arise where voluntary measures can be demonstrated to have failed. The plan will need to be updated regularly, and it is planned that this be annually, at least in the first few years of its implementation.

Raising awareness: signs has been erected at key mainland departure points and a similar sign will be erected on islands throughout the gulf.

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Island biosecurity

Tiritiri Matangi, the 'magical' island

Peter Lee
Chairman,
Supporters of Tiritiri Matangi Inc

Located 4km off the Whangaparaoa Peninsula, north of Auckland, Tiritiri Matangi Island is not only a major conservation success, it is also a superb example of partnerships in action.

Originally farmed for more than 120 years until 1971, the island was left fallow until the decision was made to create a true island sanctuary. A comprehensive restoration plan, one of the country's first, laid the groundwork: a mix of assisted tree planting plus translocations of rare species – but with a key twist: the active involvement of the general public.

A nursery was built in 1983 with the first of some 285,000 trees planted out in 1984. Together with some natural regrowth, this took the percentage of the island in bush from 6% in the late 1960s to more than 60% by 1994 when the tree-planting programme was essentially complete. Not all the island was revegetated, with open areas left to create differing habitats, allow for scenic opportunities and to protect archaeological sites.

Since the release of kakariki in 1974, 11 bird species have been translocated, many of which are rare or endangered. These include the kokako, hihi (stitchbird), saddleback, little spotted kiwi and takahe. Attention is now being turned to bringing to the island some less-endangered yet valuable species such as the rifleman and fernbird.

Weed management has always been critical. In the early days the bill exceeded $30,000 annually, but this has dropped to a more manageable $10,000pa. Modern technology has been a great benefit, with key weeds being mapped using GPS and logged into a database so any seedlings can be readily tracked and culled.

The island has been fortunate in having been largely free of pests. Possums and mustelids were never present, rabbits died out in the 1860s, and rats never got established. The only pest was the Polynesian rat, or kiore, eradicated in 1993. Surprisingly, kikuyu grass, ever-dominant on the mainland, is absent, meaning trees and seedlings could get off to a great start. However, reinvasion is always a serious threat with visitors asked to be careful and vigilant when packing bags.

While the public face remains DOC, an equally important facet has been the growing number of volunteers. In 1988, alarmed by funding cuts threatening the project, a group of public-spirited volunteers formed the Supporters of Tiritiri Matangi to raise funds. The group has steadily grown, and now with more than 1500 members is one of the country's largest conservation volunteer organisations. Over the years the group has funded or arranged sponsorship for the visitors' centre, an extensive implement shed and the purchase of a number of vehicles. It also funded many of the more recent translocations such as three kokako in 2008, and the eradication of the kiore. Most recently the supporters organised charitable funding for a major new interpretation facility.

True partners: volunteers at work on Tiritiri Matangi.

Quite rightly, the group is a true partner with DOC, and no major decision is taken without active involvement of the supporters. Its Memorandum of Understanding, signed five years ago, explicitly recognises this partnership.

What of the future? Translocations are not yet finished: wetapunga and bats remain high on the desirable list. While other islands also receive translocated species, only Tiritiri offers the combination of an unrivalled number of rare species that are easily observable, and so close to a major metropolitan area.

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East Otago sanctuary

Orokonui Ecosanctuary: giving something back to nature

Ralph Allen
Otago Natural History Trust

Until very recently, of the South Island's 151,000 square kilometres, not a square metre remained as safe habitat for native species such as kakapo and tuatara.

To help redress this dreadful state of affairs, in the year 2000, the Otago Natural History Trust began work on the establishment of a pest-proof fenced sanctuary, free of all introduced mammals. Here, east Otago's native biota would be able to flourish in an environment approaching that which existed before humans arrived. The sanctuary would be available to support plant and animal species that were appropriate to the area and that were under threat in the wild.

Orokonui Valley

The Orokonui Valley, about 20km north of Dunedin, provided about 300ha of suitable habitat with topography that was practicable to fence. Most of the valley's vegetation was native kanuka-dominated secondary forest about 100 years old. The balance included a similar-aged large stand of naturalised *Eucalyptus regnans* (including New Zealand's tallest measured tree, at 77m), a substantial gully with old-growth podocarp-broadleaved forest, and about 20ha of mixed exotic and native scrub, mainly established following removal of pine plantation.

The trust gained substantial public support for the project, and in 2007 was able to complete construction of an 8.7km predator-proof fence. More than 40km of monitoring tracks were established to form a grid for access to all parts of the sanctuary. Several months of trapping and poisoning, followed by regular intensive monitoring removed all introduced mammals: wild goats, hares, rabbits, possums, cats, ferrets, stoats, weasels, hedgehogs, rats and mice.

Restoration has proceeded apace. More than 4000 nursery-grown native plants have been established after the clearance of wildling pines and scrub weeds. Following extensive research and consultation, in November 2008 six young captive-bred South Island kaka were released from an aviary on site. Five of them have since spent most of their time in or close to the sanctuary, where two have nested and raised a chick, while the sixth has chosen to roam further afield. These are the only kaka to have lived in the wild in eastern Otago since the 1920s. In March 2009, 22 jewelled gecko, a lizard species under severe threat of extinction in the area, were translocated to the sanctuary. So far these seem to have settled in well in special sub-

Newly released kaka at feeder. Note the transmitter aerial, which enable the birds' location to be monitored.

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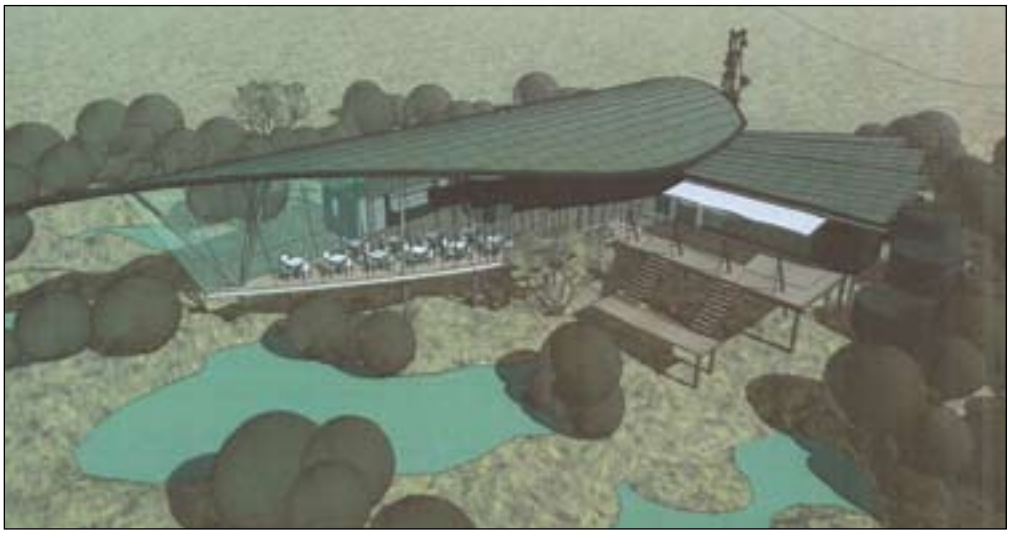
East Otago sanctuary

enclosures that enable their progress to be monitored. Further species to be reintroduced in 2009 include South Island robin and tieke (South Island saddleback), with the additional possibilities of tuatara and kiwi. There is a tragically long list of other plants, birds, reptiles and invertebrates that need protected habitat such as the Orokonui Ecosanctuary offers.



Architect's drawing of the Orokonui Ecosanctuary visitor centre.

Image: Architectual Ecology

Facilities for visitors have been developed in parallel with the restoration of a functional indigenous ecosystem. The trust decided to adopt a commercial model for the financial sustenance of the sanctuary, and established a charitable company, Orokonui Ecosanctuary Ltd, to facilitate this. The intention is that sufficient income will be generated from admission fees to pay the significant operating costs of the sanctuary. To this end, a visitor centre is being constructed that will be a showpiece of sustainable architecture, including a classroom, display area, café, and shop. High-quality paths will lead visitors of all abilities to the most interesting parts of the sanctuary, and the more adventurous will be able to explore further on several good tracks. Education and advocacy will be a major focus of the sanctuary's activities. For all visitors, the emphasis will be on experiencing nature on nature's terms.

What have been the major difficulties faced by the trust? Finding a site was relatively easy: Dunedin is well-endowed with bush-clad land in appropriate ownership (in Orokonui's case, the Department of Conservation (DOC). However, next we had to decide whether to follow the DOC "mainland island" approach of continual trapping and poisoning to maintain low numbers of introduced mammals, or to go for the Karori Wildlife Sanctuary model using a pest-proof fence. Simple arithmetic showed that to be financially independent in the long term, we needed to fence: the cost of a fence was exceeded by the cost of the alternative after some 15 years, and the fence has a life expectancy of about 45 years. Of course, this committed us to a substantial establishment cost, which had to be met by intensive fundraising, always a challenge for conservation projects. The questions of whether or not to be open to the public and, if so, whether or not to charge for entry, were debated vigorously. Both decisions were positive, on the basis that we were aiming for financial independence so that the future of the project would not be hostage to the political whims that affect public funding. That immediately committed us to the establishment of visitor facilities, another huge capital expenditure. As mentioned above, support from both the local community and from funding organisations further afield has been very generous in response to the untiring efforts of our fundraising team and general manager. This has enabled us to meet most of our capital expenditure targets.

Supervision of contractors felling pine trees and building the fence and other structures has been very demanding, and without hard-working and deeply committed staff this would have been a formidable obstacle to our success. Since the fence was completed, the eradication programme and its follow-up monitoring have also proved onerous, along with the day-to-day maintenance of the infrastructure essential to the sanctuary's security. The employment of staff is a continuing challenge: at present, while not fully open to the public, we can barely afford three full-timers, and usually employ two further staff under the Task Force Green scheme. Without the monthly 900-odd hours of help from our 400 volunteers the sanctuary simply could not function. Finding the funding to employ at least another two essential full-time staff when the visitor centre and sanctuary are fully operational will be

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a huge challenge, at least until visitor numbers rise to the level that provides sufficient income.

But the history of the project is one of success. The resident native flora and fauna are thriving in the absence of introduced pests. The programme of reintroductions of species that were formerly present in east Otago is well under way. Within a few months the visitor centre will be completed and Orokonui Ecosanctuary will be formally open to the public and our education and advocacy role can commence. None of this would have happened if not for the goodwill and dedicated support of our staff, our members, and the wider community. The future of New Zealand's wonderful native flora and fauna is a little more secure. With the establishment under way of some 20 similar projects throughout the country, the evolution of our unique biota should be able to continue in these areas much as it would have in the absence of people and the pests they brought with them and hopefully assist in re-stocking New Zealand's forests in the future.

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Control methods

Controlling possums well with less 1080

Graham Nugent[1] & Bruce Warburton[2]

[1] Senior Scientist, Wildlife Ecology and Epidemiology Team
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Landcare Research
Lincoln

Aerial 1080 poisoning has come a long way since poisoned bait was first loaded into the hoppers of fixed-wing aircraft in the 1950s. Today, GPS-guided helicopters sow much-reduced quantities of high-quality bait over precisely mapped areas and deliver reliable high kills of possums and rats (see Fig). For rugged and/or heavily forested areas, aerial poisoning is by far the most cost-effective tool available for large-scale possum control, but recent research suggests that even greater reductions in cost and 1080 use may be possible.

The first inklings of that emerged from trials carried out in the central North Island in 2006, where Landcare Research tested various combinations of sowing rate, sowing pattern, and numbers of prefeeds. Some of the experimental treatments produced good kills, particularly where prefeeding was used, but others had poor outcomes. Overall the results suggested that the way baits were distributed on the ground and the quality of bait were important. In particular, it appeared that some possums had to find more than one 1080 bait to be killed, and if that did not happen quickly enough they survived and became poison shy. Aggregating bait into high-density strips or clusters was thought to be one solution to this problem. Three main trials have been conducted since then that strongly support this new approach to aerial poisoning.

The first trial, in Whirinaki in 2007, showed similar reductions in possum and rat activity (based on leg-hold trapping and ChewTrack card indices) between 100ha blocks poisoned aerially with 2kg/ha cereal 1080 bait either broadcast evenly using a spinner or sown in strips without a spinner. Similar reductions were also achieved when 80% less bait was hand placed in clusters at just 0.4kg/ha along parallel transects spaced 100m apart (the same as the spacing used for the aerial sowings). As long as prefeed was used, all of the possum and rat reductions were high (86-100%). The results indicated that it was not essential for a good kill to completely cover the whole area with a more-or-less even density of bait.

The second trial, in 2008, was a step up to a large operational scale. About 18,000ha in the easternmost part of Molesworth Station, Marlborough, was divided into four blocks, and two were poisoned using the standard approach used there previously – 2.5kg/ha of aerially broadcast cereal 1080 baits without prefeed. In the other two blocks, a 60% lower sowing rate (1kg/ha) was used and the bait was sown in clusters using a modified sowing bucket with a gate that dumped about 40 baits at a time at preset intervals. Equally good reductions in activity were obtained with the clustered baits (100% and 90% in two replicates) as with the broadcast baits (96% and 89%), and post-poisoning trapping data also showed no difference between cluster (1.1% RTCI) and broadcast sowing (0.9% RTCI).

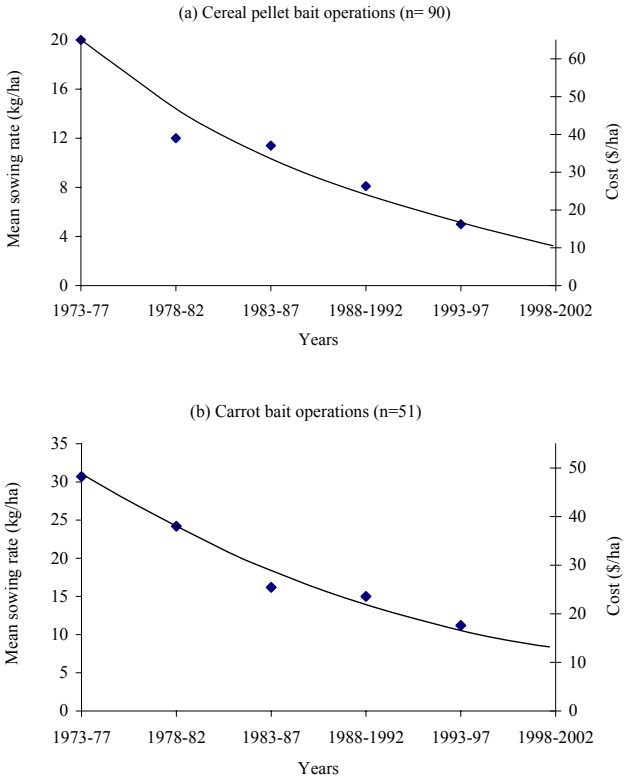

Fig. The continuing decline in the amounts of cereal and carrot bait applied per hectare for controlling possums (from D. Morgan).

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Control methods

The third trial, in South Westland in early 2009, was the most ambitious yet. In three pairs of blocks (400-500ha) it compared possum kills from the usual approach used by the Department of Conservation in that area (prefeeding followed by 3kg/ha of aerially broadcast 1080 cereal baits) with two low-sow approaches. Both low-sow approaches were prefed, and delivered just 0.25kg/ha of 1080 cereal bait in clusters spaced about 40-50m apart and each containing about 10 baits, but in one the prefeed was broadcast evenly over the whole area while in the other it was concentrated at the sites where toxic bait was later sown. Despite using 92% less 1080 than usual, the low-sow approach with aligned prefeed achieved a similar kill to the 3kg/ha treatment. However, percentage kills were lower where prefeed was broadcast evenly.

While it is still early days, these three trials indicate that there is potential to significantly reduce the amount of 1080 bait used without compromising effectiveness. Ultra-low sowing rates of just a few hundred grams of 1080 bait per hectare may increase the probability of failure, but the potential reductions in cost and toxin use appear more than large enough to make that trade-off worthwhile. Given the concerns of some people about broadcast baiting with 1080, being able to use much much smaller amounts in a much more precise way should help address some of those concerns and help retain access to this most cost-effective of possum control tools until alternatives can be put in place.

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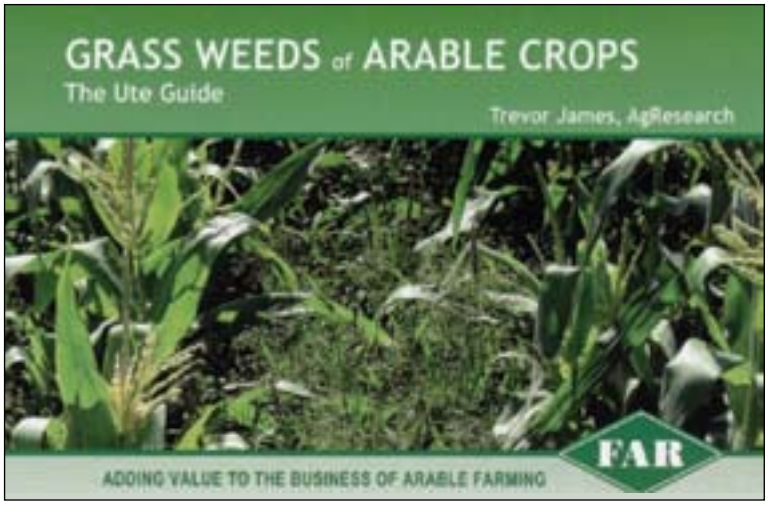
Weed guide

Guide cheap, easy to understand and extremely useful

Grass Weeds of Arable Crops: The Ute Guide

By Trevor James, published by The Foundation for Arable Research (FAR), from whom copies can be purchased at $5 each.



Remember *What grass is that?*, by Nick Lambrechtsen of DSIR? First published in 1972, it underwent minor changes through several editions and reprints before it finally disappeared sometime in the late 80s.

Here, at long last, is a partial replacement that helps field workers identify common grasses. The title says "Grass Weeds of Arable Crops", but these grasses are among the most common ones found anywhere. They appear among our vegetables, in our lawns, in cracks in footpaths, along roadsides, and in the ubiquitous waste places. Take a look at the book – it's cheap, very easy to understand and extremely useful.

One of the great things about this book is that it doesn't use much in the way of line drawings to illustrate important aspects of ligules, flower heads and basal sheaths. Instead high-quality close-up photographs do the job more than adequately.

The book isn't quite perfect, and the author (Trevor.James@agresearch.co.nz) would appreciate any suggestions for its improvement, especially for the keys, which can be used to help readers decide which kind of grass they have. A couple of problems we've picked up already are the lack of any indication of scale on some of the photographs, and the picture at lower left on page 34 of the tall oat grass (*Arrhenatherum elatius*) entry.

Buy a copy, try it out, and let Trevor know of any suggested improvements.

Ian Popay
Dept. of Conservation
Hamilton

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BIOSECURITY NEW ZEALAND **News**

Agencies join forces to fight kauri disease

Six government agencies have joined forces to try to stop the spread of a disease that affects kauri trees.

The newly identified disease – Kauri dieback (*Phytophthora* taxon Agathis or PTA) – has been confirmed as attacking trees in Northland, Auckland and on Great Barrier Island.

The six agencies – MAF Biosecurity New Zealand (MAFBNZ), the Department of Conservation (DOC) and four regional councils; Auckland Regional Council, Northland Regional Council, Environment Bay of Plenty and Environment Waikato – have set up a response team to identify and manage the risks to kauri.

Kauri is a nationally and regionally significant species that is a taonga of great significance to Māori and has cultural value for many New Zealanders. They are part of New Zealand's history, and an essential part of the ecosystem as they are home to many other trees, plants and threatened wildlife.

PTA, or kauri dieback as it's more commonly known, is a serious threat to kauri forest and individual kauri trees in the upper North Island. Believed to be a soil-borne disease caused by a soil pathogen, PTA is specific to kauri and can kill trees and seedlings of all ages.

It is believed to be spread mainly through soil and soil water movement, and it is strongly suspected PTA can be transferred by people, tracked from place to place on shoes, equipment and tyres.

PTA has been found at sites in the Waitakere Ranges Regional Park, DOC reserves on Great Barrier and Trounson Kauri Park in Northland. Symptoms of kauri dieback have also been observed in other areas within the greater Auckland region.

Until more is known about PTA, one of the strongest chances of containing it lies with public education. The Joint Agency Response team has been liaising with iwi, local councils and landowners in the upper North Island, as well as members of the public using kauri areas, asking for their help in stopping the disease from spreading further.

Information sheets and track signs have been distributed encouraging simple behaviours people can adopt right now to stop further spread – namely keeping to defined tracks in parks and reserves, and cleaning footwear and tyres, or any other equipment that comes into contact with soil, before and after leaving kauri forest areas.

A website – www.kauridieback.co.nz – and 0800 number have also been set up (0800 NZ KAURI).

PTA lesions on a kauri tree in the Cascades Regional Park in the Waitakere Ranges, Auckland.
Photo: Auckland Regional Council

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BIOSECURITY NEW ZEALAND **News** Continued

Keep a look out for unusual freshwater crayfish

MAF Biosecurity New Zealand (MAFBNZ) is appealing to those exploring the North Island's freshwater streams and ponds to be on the lookout for an introduced freshwater crayfish that could threaten our native koura.

The Australian crayfish, known as marron, can harm our freshwater environment by competing with native species for food and habitat.

Marron were legally introduced to New Zealand for farming in the 1980s. Farms were later shut down and all known stock eradicated when it was found the introduced crayfish posed a risk to the environment.

Despite this eradication, MAFBNZ suspects a small number of marron may remain in unknown populations. It is believed the most likely places where marron could potentially be found are in fresh waterways, notably ponds, in the upper North Island.

Small numberf of marron may still be in upper North Island fresh waterways.

MAFBNZ is circulating information on the crays to waterway users all over the North Island as a precautionary measure. Fact sheets and laminated identification guides are being distributed through the Department of Conservation, regional councils, Fish and Game New Zealand and science and research facilities.

Marron are similar to appearance to native koura only they can grow to a larger size (approx 38cm long), and their large front claws are smooth textured (as opposed to the native koura's hairy or spiny claws).

If you believe you have seen a marron, take a good note of its location, take a sample if you can, and call MAFBNZ tollfree on 0800 80 99 66.

For further information on marron, visit: http://www.biosecurity.govt.nz/pests/marron

Copies of fact sheets or ID guides are available by contacting MAFBNZ's communications team: lesley.patston@maf.govt.nz

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