

The Biosecurity New Zealand (BNZ), Incursion Investigation team, and the process to notify BNZ of suspect new pests and diseases.

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Scientists, diagnostic laboratory staff, industry representatives, biosecurity officers and farmers or growers in New Zealand's primary industries are usually the first to detect new organisms or their impact on New Zealand's productive sectors and environment. This paper outlines the purpose of the Biosecurity New Zealand, Incursion Investigation team in undertaking investigation and initial response management of suspect and new exotic pests and diseases. A description of the Incursion Investigation team structure, accountabilities and functions are provided. General criteria and the process for using the suspect new pest or disease notification number (0800 80 99 66) are given. Example investigations and initial responses highlighting the importance of early notification of suspect new pests and diseases to Biosecurity New Zealand are used.

Skip Phase Possum Control

Graeme Butcher – Operations Controller, GW

Skip phase possum control is a method GW has instigated to manage possum populations within the Wellington Region. It reduces vector control on the ground, thereby saving resources which can be directed into other operations. The process requires a commitment to monitoring possum populations and only instigating control once thresholds are reached.

It requires setting realistic performance targets to provide protection for multiple years, and predicting that annual possum control can be eliminated. The process requires an annual review of operations to ensure an up-date of predictions.

This process has been instrumental in substantial savings for Vector Control in this Region and will become even more critical as the Animal Health Board (AHB) withdraws funding as local elimination of Bovine Tb occurs. Regions will not be able to fund possum control operations for biodiversity benefits to their current levels once Bovine Tb eradication has occurred and the AHB withdraws their 90% funding.

EXPERIMENTAL MANAGEMENT OF PREDATORS AND MESO-PREDATORS IN NEW ZEALAND DRYLAND ECOSYSTEMS

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Progress in managing threats to native fauna in New Zealand's dryland ecosystems is limited by incomplete knowledge of interactions (predation, competition and herbivory) among introduced pests as well as native wildlife and plant species. Managers often ask about the ecosystem consequences of single-species pest control, such as rabbit removal or ferret control. We used qualitative analysis of a dryland food web to predict which experimental manipulations of feral cats, ferrets, rabbits, ship rats, house mice, brushtail possums, hedgehogs, weasels and stoats would enable us to distinguish among alternative models of trophic interactions between these pest species and their primary native food resources (fruit, seed and invertebrates). Based on these analyses, a large-scale experiment (removal of top predators, i.e. cats, ferrets and stoats) has been implemented on two replicated sites in Alexandra (Central Otago) and Macraes Flat (East Otago). The aim of the experiment is to generate data for multi-trophic interactive models for functional groups of species in dryland ecosystems. A key prediction is that meso-predators (rats, mice and weasels) will respond numerically to the lack of top predators, and we aim to measure the consequences of those responses for native species (lizards and invertebrates). Ultimately, the results of our research will help managers understand (and predict) the ecosystem consequences of removing single species such as rabbits or predators in drylands.

Absence of evidence to evidence or absence – drivers, emerging issues and what the future may hold for surveillance in NZ.

Katherine Clift, Manager Biosecurity surveillance

Abstract: Surveillance is not an isolated activity but one that contributes to many areas within the biosecurity system, including official assurances for trade, risk analysis and import health standards, decision-making during responses and for pest management. There drivers affecting why, how and to what level we undertake surveillance have changed considerably. There are also new issues to contend with; globalisation has resulted in increased opportunities for spread of pests and diseases and environmental changes are resulting in changes to the host ranges and distribution. The Biosecurity Surveillance group are currently developing a surveillance strategy. This strategy includes reviewing the current state of surveillance in NZ and identifying an improved approach and principles to guide future surveillance activities

A Mainland Island in a Water Collection Area - Wainuiomata Mainland Island

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Wainuiomata Mainland Island is located in unlogged podocarp forest situated north-west of Wellington City. A 100m by 150m grid of bait stations has been established in 1,200ha of the upper catchment of the Wainuiomata River. It is within one of two water collection areas used to supply water to the cities in the Wellington region. The mainland island project got underway in August 2005 following an aerial 1080 operation over the wider water collection area. Since that time, the bait stations have been replenished with Ditrac (to control rats) on a two-monthly basis. Ongoing possum trapping has involved the use of traps, while intensive ungulate control has been completed. Stoat traps are in place along the ridges and on the outer edge of the intensive control core. A non-treatment area has been established in similar vegetation outside the mainland island. Monitoring of rodents/mustelids (four times a year), tawa fruitfall plots (yearly) and 5-minute bird counts (yearly) are undertaken in both areas. Rat numbers within the intensive control area fell dramatically after the 1080 operation, then rose to 19%, before falling to 3% in February 2007. In the non-treatment area in the latest monitor, rats were tracking at 81%. Birds were monitored in November 2006, but no changes in bird abundance have been found as yet. A strategic plan for the mainland island has been produced and it is hoped that the site will be ready for a North Island robin release in 2008/09.

The Urban Greenspaces Project

Chris Dench - Urban Greenspace Project Coordinator, Tauranga Environment Centre

The Urban Greenspace Project was launched by the Tauranga Environment Centre in August 2005 with the main aim of increasing the number of **community conservation** groups within the Tauranga urban area.

The project was initiated as a result of growing demand from the community and a lack of co-ordination available to volunteer groups wishing to adopt their local area for restoration. As well as bringing communities closer together. The Urban Greenspace Project is focused on community conservation. Aiming to restore Tauranga's urban greenspaces (reserves and gullies), which have become significantly infested with weeds. Local areas are adopted by Care Groups, which are comprised of volunteers from around the neighbourhood. Every group receives free advice, events planning and resources (i.e. plants, morning teas, tools) for their restoration site through the project. The long-term outcomes include re-establishing native plants and animals (biodiversity) in the region, creating awareness of the natural environment and providing 'healthy' recreational areas for everyone to enjoy.

The **long-term** goal of the project is to increase the available habitat and the natural biodiversity of our city's greenspaces. The project currently has ten Community Care Groups with over 150 volunteers. We work together with the Ministry for the Environment, Tauranga City Council and Environment Bay of Plenty.



“ Biosecurity – A Game of Two Halves” (395)

Terry Donaldson - National Service Manager
Biosecurity Plants and Forestry Surveillance and Notifiable Plants
AgriQuality Ltd.

The first half of the game has been played out in converting New Zealand to a unique farm supplying the world markets with quality, safe food. The second half, the challenge ahead of us, will be played in front of a larger international audience with 6.6 billion supporters.

At half-time in the mid 1980's the ref blew the whistle and we were told that the commodity market to which we supplied our bales of wool, our boatloads of Canterbury Lamb carcasses and our tons of butter and cheese was changing and in a massive way.

At the same time the wise government decided that Agriculture was a sunset industry and tomorrow we would be shearing tourists instead of sheep, logs and fish would be harvested instead of wheat, and all farming subsidies would be removed forthwith!

As the second half of the game got under way the ref explained that the rules of the game that we started with had changed.

Unfortunately those politicians overlooked (or ignored) the risks that these changes would bring to our established farming and indeed our natural environment, which was the attraction for the international tourists.

In this next quarter of the game we need to tighten up our defence and turn to an assault mode if we are to have a future for our children and our children's children in this green and pleasant land. Our defences will require a fit and totally committed front row backed by new technology to outsmart all those who would destroy not only our team, but our home ground.

They will need the support of all New Zealanders – bugger the red socks for a boat race- we need everyone in green socks for the biosecurity game of our lives!

Fertility Control for Wildlife Management

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New Zealand is developing new technologies for the biocontrol of pests, such as possums and stoats. Such technologies should be safe, effective, economic, readily delivered to wild living animals and offer species-specificity.

Biotechnologies for possum control are being evaluated by the recently formed National Research Centre for Possum Biocontrol. One approach is a fertility control vaccine delivered orally in baits, taking advantage of New Zealand's highly effective aerial and ground systems for delivery of toxic baits. We have identified a number of possum egg coat (zona pellucida (ZP) proteins and peptides) that have potential as possum-specific contraceptive antigens. For field delivery of an oral vaccine, we are investigating the use of non-living bacterial "ghosts". The possum's immune system recognises the bacterial ghosts as foreign, and produces antibodies against them and the possum egg proteins, causing a contraceptive effect. In proof of concept trials, female possums immunised with a possum ZP2-bacterial ghost vaccine by nasal spray showed a significant reduction in fertility. However oral delivery may require protection of vaccine ghosts from degradation in the gut and we are currently evaluating protective formulation systems. Priorities for research are increasing vaccine efficacy and longevity ahead of proof of concept studies of vaccine bait delivery systems for possums by 2009.

Stoats are a highly effective predator of native bird species. Their unique breeding cycle offers a long window of opportunity for disrupting reproductive function and makes stoats excellent candidates for fertility control. Landcare Research has investigated the reproductive biology and immunology of stoats and established the first captive breeding facility for stoats in New Zealand. Both immune-based and biochemical inhibition of reproduction are being investigated for future stoat control applications.

Contracted research for Foundation for Research, Science and Technology, Department of Conservation, Animal Health Board and Landcare Research.

Engaging Māori on Environmental Issues

Linda Faulkner – ERMA New Zealand, General Manager Maori

New Zealand's environmental uniqueness both natural and cultural, continue to set it apart from others and has raised significant interest on a world stage as was evidenced at the recently held World Heritage Conference. Even internally when we think about New Zealand's national identity, our unique environment and native biodiversity is at the forefront of the conversation. An important part of this uniqueness is based around the cultural history and context within which the environment and native species exist. Managing and maintaining our native biodiversity extends to ensuring the rich cultural context that surrounds it can flourish.

Māori have a relationship that is inextricably inter-twined with the natural world spanning centuries of observation and experience from which a distinctive body of knowledge and cultural practice has developed. With issues like environmental protection and sustainability proving to be increasingly important values to New Zealanders, iwi/Māori have a significant body of knowledge and understanding of the New Zealand environment to contribute. This knowledge and experience is valuable, alongside that of contemporary scientific knowledge and experience, to the development of innovative tools and processes for protecting our unique environment.

This presentation explores the importance of empowering the kaitiakitanga role of iwi/Māori recognising that its practices are founded in a heritage inspired knowledge system that has been established specifically within the unique New Zealand landscape. The central role of kaitiakitanga is the protection and enhancement of the natural resources and environment for the benefit and sustainable use of future generations. Establishing real and relevant working relationships or partnerships with iwi/Māori can be very difficult in a constitutionally challenging environment. However there are a growing number of examples, particularly at the local engagement level, of successful programmes and initiatives that provide models for moving forward.

Interactive Key to Grasses

Kerry Ford – Landcare Research

A new web-based interactive key to the grasses of New Zealand is being undertaken. There are 460 species of grasses in New Zealand: 188 are native (including 157 endemic species) and 272 are naturalised. Grasses generally are known as a difficult group in which to identify species and this interactive key aims to make identification easier and more effective than dichotomous keys presently available.

Grasses are an important component of many New Zealand ecosystems and there is a strong demand by different sectors, particularly Biosecurity and Conservation, to identify naturalised and indigenous species. Ornamental grasses have become fashionable in recent years increasing the threat of incursions, e.g. the recently introduced *Nassella tenuissima* being a spectacular case of an unwanted species arriving recently via the nursery trade. Many indigenous grasslands and pastoral lands are threatened by invasion from introduced plants including introduced grasses. Landscapes include a mixture of both indigenous and naturalised grass species and it is critical that Biosecurity Officers, Conservation field staff and researchers can distinguish between species.

Aw Ref – They’ve been doing it all day – lessons from the referee

Rob Forlong - Chief Executive Officer, ERMA New Zealand

ERMA New Zealand is the “referee” in many debates around hazardous substances and new organisms, including the controversial topics of 1080 and genetically modified organisms. So from time to time, ERMA and the decisions it makes receive strong criticism from the “players” in these debates.

In his presentation Rob Forlong will explain what ERMA does and the issues that it deals with. He will look at a case study of the introduction of new plants into New Zealand and if 1080 reassessment process so far.

National Pest Plant Accord – changes and future directions

Andrew Harrison – MAF Biosecurity New Zealand

The National Pest Plant Accord (Accord) is a non-statutory agreement between the Nursery and Garden Industry Association (NGIA), regional authorities, the Ministry of Agriculture and Forestry (MAF) and the Department of Conservation (DOC). Its purpose is to prevent the sale, propagation or distribution of specific pest plants. This is enabled by declaring all pest plants listed under the Accord (the 'Accord List') to be unwanted organisms under the Biosecurity Act 1993.

The Accord was originally established in 2001, and formally reviewed in 2006. It has been renewed for another five years by the NGIA, MAF, DOC and all regional authorities with the exception of Otago Regional Council. At the same time, the Accord list was also reviewed. It currently includes 111 species and all species within four genera.

One outcome of the 2006 review was a small change to the 'target audience' for compliance effort under the Accord. This has been widened to include casual markets (such as road-side stalls and weekend markets), as well as commercial nurseries and plant retail outlets. It includes a secondary audience/focus on working with specific botanical interest groups and the general gardening public.

The Accord is effectively a compliance strategy – an approach to achieving a set of desired 'biosecurity behaviours' (e.g., 'check, clean, dry' or 'do not sell, distribute or propagate these plants') among a target audience. There are a range of compliance tools available for use in such a strategy, including: designing good systems and rules; education and persuasion; financial and other incentives; licensing and restricting; audits and inspections; withdrawal, suspension or conditioning of licenses; investigations; and prosecutions.

New Zealand's nursery and garden industry has demonstrated a strong sense of responsibility for and good record of compliance. The compliance strategy for the Accord is accordingly weighted toward encouraging compliance through designing good systems and rules, and education and persuasion. Inspections are also used, but are to be treated as an opportunity to assess and assist compliance in partnership with industry organisations. Enforcement and prosecution tools are available as a last resort, and have not been needed to date!

A number of improvements have been made or are underway to strengthen implementation of the Accord, including better support for the many capable front line compliance staff who implement the Accord on the ground. These will be outlined in this presentation.

Further information on the Accord and updates are available on Biosecurity New Zealand's website: (<http://www.biosecurity.govt.nz/nppa>) or by contacting the National Coordinator (NPPA@maf.govt.nz)

Avoiding Tears Before Bedtime: How Dialogue Can Help Us to Develop More Socially Acceptable Pest Management Strategies.

Lynley Hayes – Landcare Research

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While many people support pest control there are many others who doubt its safety and effectiveness, and universal agreement about what constitutes a pest is also rare. Scientists or land management agencies who attempt to develop pest management techniques or strategies without ensuring effective two-way communication with their communities may at best experience poor uptake of their approach, and at worst serious opposition that jeopardizes progress or even makes a strategy untenable. We describe a technique that allows those charged with pest control to engage in meaningful dialogue with their communities. People are brought together in an environment where they are treated equally, it is safe to express opinions and concerns, where they are encouraged to listen and deepen their understanding, where they can discover common ground and build trust, and ultimately they can collectively find acceptable, or even novel, ways to move forward. While we used the process to undertake dialogue on pest management issues it could be adapted for other topics and social settings as long as key elements remain e.g. good facilitation, ensuring adequate time and resources to build relationships and undertake the dialogue, promoting respect for others and good listening skills, breaking down barriers and encouraging new behaviour patterns by getting people out of established roles and settings, and finding and acknowledging common ground.

Newly naturalised plants: the environmental weeds of the future

Peter Heenan - Landcare Research

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In this presentation I have two main themes. Firstly, garden plants continue to naturalise and these will provide the environmental weeds of the future. These species should be rigorously assessed and where necessary banned. Secondly, vigilance is needed to ensure newly naturalised and well-established species are appropriately controlled and eradicated from gardens.

During the last 5-6 decades New Zealand has seen the naturalisation of some of our worst environmental weeds. For example, *Gunnera tinctoria* was first recorded as naturalised in 1968, various *Passiflora* species from 1947, *Agapanthus praecox* in 1952, and *Erigeron karvinskianus* in 1940. *Gunnera tinctoria*, several species of *Passiflora*, and *Erigeron karvinskianus* are now on the National Pest Plant Accord (NPPA), substantial amounts of money are spent on controlling these weeds by regional councils and DOC, and Landcare Research is exploring biocontrol options for the *Passiflora*.

In the 21st Century, newly naturalised plants in New Zealand are primarily garden escapes. New species of plants continue to naturalise and among the 700 or so species that have been recorded in the past 20 years a subset of these will be the invasive weeds of the future. These could include, for example, *Mandevilla laxa*, *Euryops chrysanthemoides*, *Banksia integrifolia*, *Helichrysum petiolare*, *Acacia pravissima*, and *Embothrium coccineum*. Indeed, several of these are already locally well-established.

Rigorous screening and assessment of newly naturalised plants needs to be undertaken to assess their potential impact on the urban, economic, and natural environments of New Zealand. Weed Risk Assessment of all new naturalised plants should be mandatory (central Government) and species identified as potentially among the worst environmental weeds need to be immediately regulated and eliminated from the nursery trade (using NPPA) and wild populations (Regional Pest Management Strategies, RPMS). Central and regional government needs to be vigilant and proactive toward new naturalisations.

In addition to regulations such as RPMS to control wild populations and NPPA for the nursery trade, well-known species require well orchestrated campaigns to be eliminated from gardens. Public education is critical to this process. For example, although not currently established on Banks Peninsula and the Port Hills (Canterbury), *E. karvinskianus* is still grown in gardens in the area and cultivated plants regularly self-seed in their immediate vicinity. In the Port Hills and Banks Peninsula suitable habitat exists for *E. karvinskianus* on rock outcrops and coastal cliffs that are a prominent feature of the landscape and home to a number of threatened species and local endemics; it would be devastating if this species established there.

The evolution of Community Possum Control Schemes in the Waikato Region 1998 – 2007

Dave Hodges - Environment Waikato

Environment Waikato has been involved in Community based Possum Control Scheme's (CPCS) since 1998. Since then there have been seven modifications based on improving their effectiveness, efficiency and economic sustainability. Community steering groups have been used as an interface between the Council and their local community. This has enabled us to find solutions to problems and identify methods of implementing CPCS's suiting most landowners. Environment Waikato supported the early CPCS's by coordinating the initial possum knock-down and installing bait-station infrastructures. Costs were shared between Environment Waikato and landowners. Landowners were then left to help themselves. Later innovations have seen increasing inputs from Environment Waikato. This includes covering all the costs of initial knock down, bait-station infrastructures, and contracting CPCS facilitators to provide ongoing advice, support to landowners and supplying bait at cost price. At least 75 percent support was required within a community before the scheme became binding on all landowners with 10 percent Residual Trap Catch (RTC) targets in place. These schemes were backed up by RTC monitoring and Regional Pest Management Strategy (RPMS) enforcement. Poor results forced changes resulting in the next evolution. Instead of using landowners to control possums, contractors under performance based contracts were used to achieve control. Ongoing maintenance was funded by targeted rates on all landowners within a scheme area. Under this policy results were guaranteed and 5 percent instead of 10 percent RTC targets were set. However, uncertainty due to the increasing costs of targeted rates in the future has seen the implementation of new CPCS's stall, forcing the latest evolution. The latest development directs possum control to regional priority areas funded from region wide biosecurity rates. This reflects that the benefits of possum control are received by everyone in the region. New CPCS's will address the ongoing challenges of maintaining Tb Vector control gains, catchment protection, and biodiversity enhancement resulting in an increase in community based possum control from 12 areas totalling 204,000 hectares now, to 600,700 hectares by June 30 2011.

Measuring performance of invasive plant surveillance efforts in New Zealand

Peter Holloran – Environmental student, University of California

Active surveillance involves systematic searches of vulnerable places (sites where new invasions are likely to occur) and valuable places (sites where the impact of a new invasion will cause the most ecological damage) for new invasive plant incursions (Braithwaite 2000). Allocating resources among sites and across time involves complicated tradeoffs, but there are some guidelines for the frequency of surveillance efforts (Harris et al. 2001). Once resources have been allocated, there are opportunities for practitioners to collect useful data about their surveillance activities that can be used to evaluate surveillance performance and inform future resource allocation efforts. These performance measures are illustrated using several long-term datasets documenting invasive plant surveillance activities in New Zealand.

Didymo – Thinking globally, acting locally, an industry perspective.

James Holloway – Natural Resource Advisor, Meridian Energy

Didymo was first located in New Zealand by scientists undertaking periphyton monitoring work for Meridian Energy. Since this time the company has had significant involvement in the didymo challenge.

New Zealand scientists have quickly moved to the position of world leader in didymo, however significant uncertainty on ecological impacts, short and long term management still exist. We still do not know the full breadth of ongoing management implications. This paper examines the impacts of didymo in relation to the activities of Meridian Energy.

The didymo incursion has resulted in a significant increase in risks to the company. We have needed to manage the compliance requirements under the Biosecurity Act to continue with our generation activities including the transfer of water and potentially didymo within the schemes.

Didymo poses potentially serious operational risks to both operation and integrity of schemes. A number of less direct risks also exist with regard to the social and environmental aspects of our operations.

To consider and manage these risks, Meridian has examined overseas operations especially in the United States. Significant resources have also been expended on scientific and legal / planning advice. While this has been extremely useful we are not yet in a position where we are comfortable that we have adequate durable strategies in place. We continue to watch where the research and legal frameworks are shifting and overseas risk management strategies to formulate programs for local use.

Manchurian Wild Rice (*Zizania latifolia*) Control & Management in Northland

Peter Joynt – Northland Regional Council

At present largely confined to the Northern Wairoa river and its tributaries, Manchurian Wild Rice is largely unknown outside of Northland, with a limited number of sites in the Auckland and Waikato regions and one site at Waikanae Wellington. This giant of a plant is extremely invasive and difficult to control and has the potential to invade river banks, lakes and wetlands throughout New Zealand. With its ability to totally suppress all other species and readily establish new sites it poses a huge threat to not only river channels and drainage systems but also indigenous wetland systems and a range of economic and environmental values. This paper will discuss the various options for managing this plant and the programme of containment, management and control carried out by the Northland Regional Council over the past 10 years.



Environmental Behaviour Change

“Will social marketing’s ‘toddler’ grow up in time?”

Jeremy Lambert - Communications Manager - MAF BIOSECURITY NEW ZEALAND

Background

New Zealand’s economic performance is largely dependent upon its primary production and tourism industries. These industries, in turn, rely heavily upon the environment.

New Zealand’s Ministry of Agriculture and Forestry is the country’s lead government agency for biosecurity and primary industry sustainability. Much of the Ministry’s work relies upon the delivery of social marketing programmes that:

1. protect the country from the potential harms of exotic pests and diseases; and
2. deliver sustainable agricultural and forestry practices

Unfortunately, there are some unique challenges that face environmental social marketers (*vis a vis* health or education social marketers). Thankfully there are also some unique opportunities!

This presentation will examine the relative ‘toddler’ of the social marketing family and ask the important question – will the ‘toddler’ grow up in time to save the world!

Objectives

This presentation will draw upon the experiences of the author as he:

1. compares the relative development of environmental and health social marketing
2. looks at the current state of environmental social marketing, assesses whether or not there is time for it to make a difference and if so, how

Specific social marketing case studies the author will draw from will include:

- Environment: Check, Clean, Dry
A campaign from the Ministry of Agriculture and Forestry (NZ) to get freshwater ways users to Check, Clean and Dry their equipment in between waterways to prevent the spread of aquatic pests
- Environment: Cleaning and Anti-fouling Hulls

A campaign from the Ministry of Agriculture and Forestry (NZ) to get marine users to regularly clean and anti-foul their hulls to prevent the spread of marine pests

- Environment: Declare or Beware

A campaign from the Australian Quarantine and Inspection Service (Aust) to get passengers arriving in Australia to declare risk goods at the border

- Health: Like Minds Like Mine

A campaign from the Ministry of Health (NZ) to reduce stigma and discrimination against people with experience of mental illness

- Health: Where a condom every time

A campaign from the New Zealand AIDS Foundation encouraging men who have sex with men to use a condom every time for anal sex

Biography

Jeremy Lambert has been working in the social marketing space for nearly a decade. During that time he has contributed to some of the country's most high-profile and successful social marketing campaigns, including Smokefree, Quit, SunSmart and Like Minds Like Mine.

Most recently he has been leading the delivery of biosecurity social marketing programmes and is a member of the government's sustainability communications review board.

In his spare time, Jeremy chairs the board of the New Zealand AIDS Foundation, an international leader in the delivery of programmes that prevent the transmission of HIV and support people living with the virus.

PCA Success: A Model To Follow

Campbell Leckie – Biosecurity Manager, Hawkes Bay Regional Council

The Hawke's Bay Regional Councils Possum Control Area (PCA) programme is now at 400,591 hectares. The programme works with the Council funding the initial control or first knockdown of possum numbers using contractors, with the farming community accepting responsibility for on going maintenance. Adapting the self-help possum control model used by the Taranaki Regional Council to the Hawke's Bay has been an overwhelming success. Farmers have accepted responsibility for keeping the possum population below the 5% RTC threshold. Excellent relationships between farmers and council staff, and the use of skilled maintenance contractors have also been critical to the programmes success. Each of the 50 PCA's have a Residual Trap Catch (RTC) that is well below the council's compliance rule of 5%. Many of the PCA's have been going for 4-5 years since the inception of the programme in 2000-2001 with the (RTC) often being well below 2%. However there are differences between the Hawke's Bay and Taranaki self help models with some important lessons learned as to what has been needed to create a successful programme in the Hawke's Bay. So where to from here! One of the critical issues faced is the roll over of the Animal Health Boards (AHB) possum control operation's as the AHB progressively achieves its disease targets. Staff have already transitioned some AHB operations into the PCA programme and in doing so have learned additional lessons for future years.

The Molesworth Wilding Challenge

Nick Ledgard - Ensis

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This presentation covers the history of conifer introduction, spread and removal on Molesworth station, inland Marlborough, and the lessons learnt about wilding prevention and control. Molesworth station is New Zealand's largest farm (c. 180,000 ha). Due to there being large areas with a thin or depleted vegetation cover and light animal grazing, Molesworth is ideally suited to wilding conifer spread. Introduced trees (mainly conifers) were planted in considerable numbers in the 1940s/1950s, and between 1970–1980. The main plantings were near Tarndale, where approximately 250 ha of pines had been established by 1980. At least eleven species of introduced conifers are present, the commonest being Scots pine, a vigorous spreading species. The other main spreading species are contorta and Corsican pine and European larch. Spread, mostly of contorta pine, was first noticed and removals initiated in the 1960s. The largest current wilding areas lie alongside the Clarence river and around Tarndale. Removals of seed source trees were initiated in 1987, and by 1994 around 100 ha of the more exposed Scots pine stands had been felled – just prior to major seed production. However, by 2005, an estimated 50,000 ha were affected by wildings (mostly widely scattered), some trees occurring at least 20 km from the likely seed source. Since that time, control efforts have been increased, and by the end of 2006 all the large Scots pine stands (150 ha) had been felled. The current focus is on removing scattered outlier wildings before they cone.

The Biosecurity system, success and failures – a varroa perspective

Cr Brian Mason – Councillor Environment Southland

Whenever there is a biosecurity incident it is extremely important that a review is carried out to establish the sequence of events that occurred. It is only from building a database that we can learn how to refine and develop a better outcome for the future.

The Varroa incursion into the South Island is an excellent example of what can happen and the consequences of the decisions that were made.

A number of questions need to be answered:

- Why was the Memorandum of Understanding never signed?
- Why did MAF fail to keep the Varroa Agency in the consultative loop at the beginning of the incursion?
- Was there a lack of preparation for a suitable insecticide?
- Did the Minister have exemption powers that were never used? Or conversely – should he have exemption powers to meet biosecurity incursions?
- Did the time-frame of the decision makers lack urgency?
- Has a trace-back been instigated to identify the incursion's pathway?
- Have they recognised the significance of the pollination services and human involvement in the facilitation of Varroa's spread?

Staying at the Forefront – The Way Forward for Biosecurity in New Zealand

Dr Barry O’Neil - MAF Biosecurity New Zealand

New Zealand has been a world-leader in biosecurity ever since the late 1800s when our predecessors introduced the concept of keeping out diseases and pests to protect our developing agricultural base.

Since then, we have stayed at the forefront by widened our focus from agriculture to also protect our environment, social fabric and culture – while other countries continue to focus biosecurity efforts on economic impacts alone.

But we are not resting on our laurels. To help ensure we stay ahead, MAF Biosecurity and the MAF Quarantine Service integrated on July 1 into a new organisation to provide enhanced leadership to the New Zealand biosecurity system.

MAF Biosecurity New Zealand will be more adaptive and responsive, and it will adopt a new business model that means it is better able to identify and prioritise risks - and in doing so protect New Zealand, our people, and our natural resources, plants and animals.

MAF Biosecurity New Zealand will also have a greater focus and behave with the professionalism, dedication and skills to lead the biosecurity system - in partnership with the wider government sector, industry, and the general public.

Weedbusting at the border

Kerry Paice – Biosecurity New Zealand

Champion, P ¹Biosecurity New Zealand. ²National Institute of Water and Atmospheric Research

Biosecurity New Zealand recently uncovered an aquatic plant smuggling operation that also sold aquatic plants through the internet. The importation of any plant material by smuggling operations poses a number of serious risks to the New Zealand's environment, economy and way of life.

The plant material may be contaminated with a vast array of pest, diseases, algae and parasites that are not naturally found here. Previous examples of freshwater pests likely to have been introduced by this pathway are water net algae (*Hydrodictyon reticulatum*) and a number of snails. The plants themselves may be unwanted in New Zealand. The majority (75%) of our current aquatic weeds were introduced to New Zealand deliberately, most as aquarium and ornamental pond plants.

Current legislation requires assessment of potential weed species and inspection and quarantine of imported material to manage any contaminants or hitchhiker species. The illegal importation of aquarium plants bypasses these opportunities to identify the weed potential of the plant and any associated organisms which may threaten New Zealand freshwater ecosystems and human uses of these.

This paper further discusses these issues and documents the smuggling operation from the initial interception of plants at the Auckland International Mail Centre to the trial and prosecution.

EXPANDING A VISION FOR THE ENVIRONMENTAL, ECONOMIC and SOCIAL ASPECTS of BUSINESS

Clive Paton – Ata Rangi Ltd

This presentation discusses the Ata Rangi journey towards achieving an environmentally and socially responsible, sustainable business which is also economically sound. Clive will talk about the triggers that created the vision and outline the steps taken towards achieving his goals. Milestones and achievements include helping to develop 'Sustainable Winegrowing of New Zealand' and embracing these policies and practices; on the next level up, striving for and achieving the internationally accredited and audited environmental management standard, ISO 14001; three times winning the International Wine and Spirit Competition's Trophy for Best Pinot Noir and more recently being Supreme Award Winner of the 2006 Ballance Farm Environment Awards. On top of this, Clive is involved "hands-on" with conservation work at the Ata Rangi "Bush Block", 300 acres just south of Martinborough which was purchased in 2002. He has planted thousands of native trees there, has covenanted 120 acres of bush, and has set up the Waihora Watch, a group of neighbouring farmers whose mission it is to protect the Waihora stream and catchment. Ata Rangi has also formed a marketing collaboration with the Project Crimson charitable conservation trust, a project that has developed directly out of Clive's work with the regeneration of northern rata at the Bush Block.

CLIVE PATON BIO

Clive Paton is the founder of Ata Rangi Vineyard in Martinborough. He bought and planted the original home-block in 1980, and in doing so became one of a handful of people who pioneered grape growing in the area. Clive had formerly been dairy farming in the South Wairarapa but his love affair with red wine and belief in the potential of the area for grape-growing led him to the Martinborough terrace. Clive and the family team (Clive's wife Phyll and sister Ali) who co-own the business have developed Ata Rangi into an internationally respected brand with a particular emphasis on Pinot Noir. Responsible environmental management has been a focus from the very early days, with Ata Rangi embracing sustainable winemaking and grape-growing practices, as well as achieving ISO 14001 accreditation, becoming one of only a handful of wineries in the world to do so. Clive is also an avid conservationist, planting thousands of trees at the Ata Rangi 'bush block' and working with Project Crimson on rata regeneration in particular.

Biocontrol, heather beetle and the volcanic plateau

Paul Peterson – Insect and Plant Ecologist, Landcare Research

Helen Harman, Landcare Research, Private bag 92170, Auckland
Simon Fowler, Landcare Research, P.O.Box 40, Christchurch
Paul Barrett, Massey University, Private bag 11222, Palmerston North

Heather beetles have been released to control heather at three locations in New Zealand since January 1996; high altitude sites on the Central Plateau of the North Island (Tongariro National Park and New Zealand Army land), sites near Rotorua and more recently at low altitude sites adjacent to Tongariro National Park. Establishment at high altitude sites on the Central Plateau has been poor and, until recently, beetles have only significantly damaged heather at one site before a population collapse. Conversely, establishment success at Rotorua has been excellent with large areas of heather being consistently damaged or killed over time. Early indications suggest better establishment at low altitude sites adjacent to Tongariro National Park compared with nearby high altitude sites.

Poor heather beetle performance at high altitude sites on the Central Plateau may be linked to winter and spring conditions. Morphometric studies on heather beetles in New Zealand compared with those from original collection sites in the United Kingdom show that beetles here are significantly smaller. Smaller beetle size may be due to low genetic diversity or poor nutrition and may help to explain poor winter and spring survival.

We are currently comparing the genetic makeup of New Zealand and United Kingdom beetles, comparing nutritional status of heather from New Zealand and United Kingdom sites and following experiments to help us understand if over wintering survival is correlated with body size and if we can increase body size and improve beetle performance at high altitudes.

Byting back

Andre Post – Explorer Graphics Ltd

The use of Geographic Information System (GIS) software in the field of biosecurity is growing. GIS software can be used to access, query and analyse biosecurity information using powerful map based applications.

André will show how GIS software is used and demonstrate with several real world examples from the area of Plant Pest management and Possum Control as used by Hawkes Bay Regional Council and Taranaki Regional Council.

Biosecurity New Zealand's National Invasive Ant Programme: the past year in action

Megan Sarty – MAF Biosecurity New Zealand

The National Invasive Ant Programme began with the first find of red imported fire ants at Auckland airport in 2001. Since then, six annual surveys have been conducted at high risk border sites, and more than 60 finds of exotic ants have been successfully treated. The past year has seen an increased surveillance effort, both in New Zealand and offshore, and our third incursion of red imported fire ants. This has resulted in a three year eradication campaign consisting of intensive surveillance out to 2 km radius from the nest, aerial distribution of insecticidal ant baits in un-surveyed areas, tracing movements of risk items over the past three years, and ongoing restrictions on movements of risk items, including soil, wood, electrical equipment, and hay. In addition, a new focus on offshore risk mitigation has seen the successful trial of a model project to reduce the frequency and volume of contamination of sea containers arriving in New Zealand. Other offshore initiatives include the Pacific Invasive Ant Surveillance and Pacific Invasive Ant Identification Training. Future work will focus on refining the National Invasive Ant Surveillance programme to maximise the probability of detecting high impact exotic ants, and continuing the roll out of prevention measures offshore.

Plant biosecurity – is it time to give up?

John Sawyer - NZ Department of Conservation

Clayson Howell. Department of Conservation, PO Box 10420, Wellington 6143

There are growing pressures for New Zealand biosecurity measures to be relaxed in the interests of realising New Zealand's true economic potential. "Forget HSNO and get on with economic development". One of HortResearch's science leaders, Dr Ross Ferguson, recently described existing rules for importing new plants as extraordinarily expensive and too strict. He suggested that if we stop importing plants we effectively lose our competitive edge. There are many others lending their voice to this argument including Keith Hammett who recently described New Zealand's fervour to preserve native plants as eco-fascism. Those seeking open access to genetic material from overseas often forget about the importance of protecting New Zealand's indigenous endemic plant resources in one of the world's thirty centres of plant diversity. The statistics tell an interesting story. Exotic plant species in New Zealand now number in excess of 35,000 and are rapidly naturalising to the point where they now outnumber indigenous vascular plant species. Once established, vascular plants are seemingly impossible to eradicate. Do we really have no chance of controlling the insidious spread of exotics across the landscape? Is it time to give up caring about plant biosecurity and let this process of homogenisation win? Retaining a competitive economic edge and protecting our indigenous biodiversity are not mutually exclusive even if dramatic climate changes occur. This paper will discuss biosecurity issues as they relate to protecting New Zealand's indigenous plant life. Issues include knowing what exotic plant taxa are here already, what has naturalised, what plants are arriving and how, what indigenous plant communities are still worth protecting, evaluating the adequacy of the impact assessment process for plant imports and finally promoting the New Zealand flora and the true impacts and cost of 'weeds'. The pros and cons of existing programmes designed to educate and change behaviour and effect sustainable management of New Zealand and its indigenous plant resources are also discussed.

Pukaha - restoration of a New Zealand forest reserve without predator fencing

Tony Silbery – Department of Conservation

The Pukaha Restoration Project is based on a regime of intensive pest management over a 942 ha podocarp/hardwood forest remnant in the Wairarapa, south-east North Island. Goats (*Capra hircus*) and possums (*Trichosurus vulpecula*) have been controlled to low densities since the mid 1990s, with goats now all-but eradicated. Possums were initially controlled through aerial spread of 1080 baits. Ongoing control of both possums and ship rats (*Rattus rattus*) is based on a grid of 1057 bait stations (approx 1 ha⁻¹). Toxins (1080, brodifacoum, coumatetralyl, and encapsulated cyanide) are changed over time to minimise the risk of toxin resistance and bait shyness. Mustelids (mainly stoats, *Mustela erminea*) are controlled using kill traps (DOC 200 and Fenn) at a density of 0.55 ha⁻¹.

Captive or hand-reared kaka (*Nestor meridionalis*) were reintroduced on a trial basis in 1996; the population has increased to over 100 birds through natural recruitment and further releases of captive bred birds. North Island brown kiwi (*Apteryx mantelli*) and kokako (*Callaeas cinerea*) have been reintroduced since 2003 (and ongoing) and both have bred successfully in the reserve, contrary to the situation with unmanaged populations.

The involvement of neighbouring landowners, iwi, regional and local authorities, volunteers and sponsors all form an integral part of the Pukaha Restoration Project. Innovative strategies to build community involvement have included the "sponsor a hectare" scheme, and production of a CD of birdsong and waiata.

MANAGING RUSA DEER AND THEIR IMPACTS IN NEW CALEDONIA

Joseph Manauté & Bill Simmons – Advisor to the New Caledonian Minister of Agriculture, and Life Skills.

Javan rusa deer were introduced to New Caledonia 140 years ago and have established themselves across all of the habitats on the main island, Grande Terre. The deer are highly valued by overseas hunters and have attracted tourist revenue as well as being a source of income for deer farmers. Most significantly, rusa are an important source of protein for New Caledonians, particularly those in rural communities.

Pastoral development and the renewable sustenance provided by the pastures which have replaced many previously forested areas, have provided the catalyst for an explosion in deer numbers – particularly over the last 10 years. This situation has been aggravated by the game status of deer, European styled legislation which aims at conserving deer numbers and managing hunter behaviour, controls on arms and ammunition and an absence of any legal requirement for landowners to manage invasive pest species on their own land or take responsibility for mitigating off-site effects.

The impacts of rusa deer on biodiversity, agriculture, forestry and soil & water values are now highly visible. The deer are visibly food stressed and trophy quality has declined. Urgent action is required to reduce deer numbers in most areas and restore the values at risk; including restoring the quality of the deer themselves. A number of deer control measures have been recommended.

You Mean We Have to Sell Biosecurity?

Joe Starinchak – Outreach Co-ordinator, U.S Fish and Wildlife Service

If you take anything away from this presentation, I hope it's a new perspective. For the past 16 years, I've worked for several U.S. conservation organizations at various levels. These experiences have enabled me to see things differently. And from my point-of-view, the "selling" part of our job is the single most important aspect of our work. More than likely, your response is, *"Are you kidding me? The Biosecurity Institute paid for this American to talk to us about 'selling?' As resource managers and biosecurity professionals, we don't have time to sell anything. We are already consumed with our own organizational challenges and pressing biosecurity projects that demand our attention. Eradication activities, monitoring naturalized species impacts, 1080 controls, new species incursions, vector and pathway management require our expertise."* Sadly, in today's climate, these projects are why we have to sell, and sell effectively. The biosecurity issue is very complex. The stakes are high; we know it; the public has no idea about this issue and what is at risk, and all of our activities contribute to an effective response. So, if we don't sell this issue and involve the public, we will only shortchange our work, the environment and ourselves. Fortunately, a global revolution is occurring that gives us access to a platform that can enhance our "selling" capabilities and engage the private sector like never before to get our messages out and engage the people.

Plastic encapsulation of the ex-Navy frigate Canterbury

Peter Stratford – MAF Biosecurity New Zealand

Large vessels regularly arrive in New Zealand and a portion of these are heavily biofouled on the in-water surfaces. These biofouling species can pose a significant biosecurity risk to New Zealand as they have the potential to become established. However, with the exception of cleaning the hull of vessels via dry-docking, which isn't always practical (i.e. high costs, limited availability of dry-dock facilities), there are currently very few methods or tools by which such biofouling can be treated. A wrapping technique more commonly used on small vessels and wharf piles was therefore adapted and tested on a large vessel – the ex-Navy Frigate, HMNZS Canterbury. The Canterbury was decommissioned in March 2005 and has since been permanently berthed at the Devonport Naval base in Auckland. During this time the Canterbury had accumulated the unwanted sea-squirt, *Styela clava* on the hull. This vessel therefore provided a perfect opportunity to test a theoretical method for both containing and treating biofouling on large vessels by encapsulating the hull in plastic. The rationale behind this method is that the wrapping creates anoxic conditions rendering the encapsulated water uninhabitable by any organisms, including target unwanted species. While vessels up to 60m in length had been wrapped successfully in the past, the Canterbury, at 113 m in length, was the largest known vessel to be wrapped *in situ*. Details of the wrapping method, monitoring effectiveness and the outcome of the wrapping process will be presented.

Results of Greater Wellington Eradication (total control) programmes

Michael Ulrich – Biosecurity Officer (Pest Plants), GW

In Christchurch NETS 2005 GWRC gave a presentation about their eradication (total control) programmes in the Wellington Region. We introduced the idea of 200 metre delimiting surveys around all bird and wind spread eradication species sites as a means of proactively searching for potential satellites. These species are blue passion-flower, climbing spindleberry, smilax, mothplant and woolly nightshade.

Two years on over 100 delimiting surveys involving 10,000 inspections have been performed around these eradication species sites. With half these sites, via the 200 metre surveys being delimited, the result has been an increase around known eradication sites of greater than 100%.

In the war on total control weeds this presentation looks at results of the survey programme and includes progress on control efforts on eradication species in the Wellington region.

Island Xposure - Control of Environmental Invasive Plants on Whangarei offshore Islands

Monica Valdes – Ranger Threats/ Weeds, Department of Conservation, Whangarei

In 1995 the Department of Conservation initiated an intensive weed control programme on the Poor Knights Islands, 20km offshore from Tutukaka, Northland, New Zealand. The intention: to eradicate all infestations of four environmentally invasive plant species: Mexican devil (*Ageratina adenophora*), mist flower (*Ageratina riparia*), moth plant (*Araujia sericifera*), and pampas grass (*Cortaderia selloana* and *C. jubata*). In 1997, this control was extended to the Hen and Chickens Islands, located 40km southeast of Whangarei.

Poor Knights Islands are considered one of New Zealand's most important natural treasures, home to many endemic and native species which no longer exist on the mainland. The Hen and Chickens Islands group also has outstanding Biodiversity values with less endemism but greater diversity of habitat types and species. The habitat contains many unusual plant communities and rare species. Both island groups are gazetted Nature Reserves, administered by the Department of Conservation, with access restricted to small parties undertaking conservation management, scientific projects or for cultural purposes.

We are now in a position to evaluate the progress/successes of this programme. Control methodologies will be explained. All known weed sites are visited twice a year by the 'island weeders'- a small dedicated group comprising of Department of Conservation staff and volunteers. Visits are timed to coincide with peak germination periods and pre early flowering to minimise further seed set. Aerial surveys are completed during early flowering to locate any plants on cliff faces or in the canopy of trees. Surveillance for new sites occurs through the habitat considered to be free of weed sites.

A summary of the results to date will be presented using graphic representation of population trends over time. A spreadsheet was developed that provides useful field data for control purposes and the raw statistical information for management and monitoring purposes. Key point: significant reduction in the level of infestation of the targeted species throughout the islands has been achieved, although, moth plant and Mexican devil have proved tenacious. Tactics to improve locating infestations will be discussed. There are questions about the longevity of seed viability concerning reinvasion sources.

Translating research into operational tools using didymo as a case study

Frances Velvin – MAF Biosecurity New Zealand

Donaldson, JW; Vieglais, CMC
MAF Biosecurity New Zealand

Several times each year a new species is recorded in New Zealand for the first time. Identification of a new-to-New Zealand species prompts an incursion response and Biosecurity New Zealand initiates actions appropriate to the organism. An investigation of *Didymosphenia geminata* (didymo) after it was discovered in Southland, New Zealand, in 2004 identified this freshwater alga as an invasive species with potentially significant impacts on the New Zealand economy, environment and social values. Several streams of research were initiated to provide information on potential distribution, impacts and control options to inform incursion management decisions. We will report on how this research has led to the development of operational tools that are used by government and regional organisations, recreational groups, industry and other freshwater users to manage the risk of this invasive species.

Can managers predict the spread and persistence of pest ants in their region?

Ward, Darren¹; Stanley, Margaret¹; Toft, Richard²; Rees, Jo²

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Invasive ants are a significant ecological and economic threat to many regions of New Zealand. At present, some RCs and DOC currently control only two species of ants, Argentine and Darwin's ants. However, we know very little about the risks from other invasive ants in terms of climatic suitability, potential distribution, their ability to persist and their potential impact. How can managers best use their limited budgets to manage the ant pests that are most likely to persist in their regions and most likely to have damaging impacts? We used an ecological risk scorecard to rank invasive ant species on their likely pest status to humans and to native ecosystems. At a large scale we know some ants (eg. Argentine ants) can spread rapidly through their association with humans. But how might this be affected by climate? Through large scale climate modelling we can confidently predict the suitability of 'high risk' ant species to various regions throughout New Zealand. However, at a smaller scale (i.e. once in a region) do ants spread rapidly and persist? A recent study of Argentine ants resurveyed the same localities 5 yrs apart. While it showed relatively slow colonisation of new sites, it showed strong persistence once established, although there appear to be considerable annual fluctuations in density.

Charting new waters controlling marine pests

John Willmer – MAF Biosecurity New Zealand

Marlborough mussel farmers have been the driving force behind a marine pest management programme underway across the Nelson / Marlborough regions. The mussel farmers have taken a leadership role working with a range of local and central government agencies and stakeholders to develop and implement a pest management programme. In doing so, they have achieved some notable results.

In the best traditions of kiwi ingenuity the mussel farmers and service providers applied their resources, capability and experience of operating in the marine environment to undertake extensive pest control activities throughout the region.

In doing so, they trialled and refined a number of pest control techniques that involved wrapping various structures in plastic and covering the seafloor to kill off *Didemnum vexillum*, an invasive fouling sea squirt.

The local councils played key supporting and coordination roles within their respective communities. Councils engaged with stakeholders to deliver a wide range of activities from public awareness, to liaising with vessel operators to reduce the risk of the pest being spread, through to providing a containment area within the port where vessels or marine equipment could be safely decontaminated.

The programme continues to demonstrate the value of working in partnership to deliver marine biosecurity outcomes, and provides a useful model for future initiatives. It has resulted in an increasing willingness of agencies, industry and other stakeholders to engage and invest resources in the programme, in turn, building regional marine biosecurity capability.

The programme has paved the way for biosecurity agencies and stakeholders to work in partnership to develop an integrated regional marine biosecurity programme across the top of the South Island. The regional programme will take a generic approach dealing with the full range of biosecurity risks. First steps for the partnership is to develop a regional biosecurity plan that will provide a framework for agencies and stakeholders to identify, and provide for their broader biosecurity interests in a coordinated manner.