A PUBLICATION OF MAF BIOSECURITY NEW ZEALAND

biosecurity

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JUNE 2009

Protecting our marine environment

Giving biofouling the slip

Aquatic animal diseases

Antarctica: the driest, coldest, windiest continent

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Biosecurity magazine

Biosecurity is published six-weekly by MAF Biosecurity New Zealand. It is of special interest to all those with a stake in the protection of New Zealand's economic, environmental and social assets from the dangers posed by pests and diseases. Animal welfare issues are also covered. The articles in this magazine do not necessarily reflect government policy.

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ISSN 1174 – 4618

Production and printing management by City Print Communications in association with Context Public Policy Communications.

BIOSECURITY NEW ZEALAND

Environmental Paper Profile

Biosecurity Magazine is printed on Sumo Gloss.

Sumo is an environmentally responsible paper manufactured under the environmental management system ISO 14001 using Elemental Chlorine Free (ECF) pulp sourced from sustainable, well managed forests.

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EDITORIAL

Giving biofouling the slip

Invasive species are one of the four greatest threats to our marine ecosystems, along with land-based pollution, the over-exploitation of living marine resources and the alteration or destruction of marine habitat.

While biosecurity in a terrestrial context has been around for well over a century, marine biosecurity is a much younger discipline and has only really been identified as a major issue in the past 20 or so years.

There are two major opportunities for the unintentional introduction of species into New Zealand, both of which relate to shipping – ballast water (water carried inside a vessel for stabilisation) and biofouling (the attachment of organisms to the outside of a vessel and in its internal water systems).

Shipping is an international industry, so managing the risks from marine pests and diseases associated with shipping needs an international approach. New Zealand has mandatory requirements for vessels to manage their ballast water, and is currently working through the processes to become a party to the 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediments.

The situation for managing biofouling is very different. There are currently no internationally agreed biofouling measures in place. For New Zealand this is a major concern because analysis by the National Institute of Water and Atmospheric Research (NIWA) of the introduced marine species that we already have suggests up to 87 percent of species are likely to have been introduced as biofouling (Kospartov et al (in press))[1].

Until recently, there was a belief that antifouling paints had minimised the risk of invasion through biofouling but research undertaken here and in Australia has shown that biofouling is a real and ongoing biosecurity concern. Biofouling can be extensive in "niche areas" such as sea chests, propeller shafts, or bow thrusters even when the main hull of a vessel is clean, and slow moving or poorly maintained vessels can accumulate literally tonnes of biofouling. The research has also identified a range of potential measures to address biofouling risks such as designing vessels so that antifouling systems are more effective, applying different antifouling paints to niche areas, or using targeted and contained in-water cleaning. (See page 6 article for more details on biofouling risks.)

As a result of these research findings, there is starting to be international movement on the biofouling issue. In 2007, New Zealand, along with the United Kingdom, Australia, the International Union for Conservation of Nature (IUCN) and the Friends of the Earth International were successful in getting the development of management measures for biofouling on the International Maritime Organisation (IMO) Marine Environment Protection Committee's agenda. The IMO is the major standard setting body for marine biosecurity issues related to shipping.

Since February 2008, MAF Biosecurity New Zealand (MAFBNZ) has been leading an IMO "correspondence group" on biofouling – a group with representatives from some 18 countries and nine non-governmental organisations, including industry peak bodies and conservation groups. The group has been working via email to summarise what we know about biofouling from research, to look at the potential impacts – positive and negative – of biofouling regulations on industry and on the environment, and to identify best practice measures for managing biofouling.

Based on the correspondence group's work, in February of this year the IMO agreed to the development of international guidelines for managing biofouling on ships. This is a significant step forward and could mean that an internationally agreed approach is only a few years away – which is lightning speed for international measures and good news for our marine ecosystems.

■ Dr Naomi Parker, IMO biofouling correspondence group Chair, MAFBNZ Manager Strategic Science Team, Senior Science Adviser – Marine.

1 Kospartov K; Inglis G; Seaward K; Brink A van den; D'Archino R; Ahyong S (in press) *Non-indigenous and cryptogenic marine species in New Zealand. Current state of knowledge – Interim report prepared for MAFBNZ Post Border Directorate.* MAFBNZ, Wellington, New Zealand.

BIOFOULING CONTROL METHODS FOR ARRIVING YACHTS

Example of extreme vessel biofouling.

Formal controls are being developed to minimise the risk of biofouling introducing aquatic species that could harm New Zealand's marine environment.

Non-indigenous marine organisms pose a major threat to New Zealand's marine environment. These species can cause significant harm by dominating native communities, displacing local species, as well as impacting on aquaculture operations.

Introduced marine organisms typically arrive either in ballast water or as biofouling (animals attached to a vessel's hull). Ballast water is regulated by an import health standard that requires all vessels planning to discharge ballast water in New Zealand to have exchanged that water in the open ocean (more than 200 nautical miles from land and at a water depth of more than 200 metres).

Vessel biofouling has only been recognised as a means of introducing invasive species for the past decade.

Recent work found between 69 and 90 percent of known introduced marine organisms in New Zealand were probably brought in via hull biofouling.

MAF Biosecurity New Zealand (MAFBNZ) is working through the International Maritime Organisation (IMO) to develop international measures for minimising the transfer of invasive aquatic species through biofouling on ships.

A formal risk analysis of biofouling on recreational vessels arriving in New Zealand is underway at present, and a discussion paper will be available later this year as part of public consultation on measures being developed by MAFBNZ to minimise the risk, particularly from international yachts.

A recent biofouling survey of 181 international yachts and launches found them to be a high-risk pathway, with many having growth on their hulls, mainly in niche areas such as the rudder and keel. International yachts, most of which arrive in Opua, Northland, make up about 20 percent of New Zealand's total vessel arrivals.

MAFBNZ's Grant Weston holding the SCUBAR camera system.

While formal controls are being developed to address the issue of biofouling, MAFBNZ has been

Quarantine Wharf at Opua – the first civilisation many yachties see when they arrive in New Zealand.

running a voluntary compliance effort for some years.

Over the past year, extra effort has been put in to raise awareness and encourage good practice in keeping hulls clean, particularly for yachts coming to New Zealand from the Pacific Islands – given about 70 percent of all international yachts arrive from Tonga or Fiji.

Communications programme stressing the key message of "Clean and antifoul your boat".

A communications programme has been developed around the need for vessel cleaning, stressing the key message of "clean and antifoul your boat". Brochures are included with government agencies' yacht information packs distributed to Pacific Island marinas and posts, and information is available on the MAFBNZ website in a specific section for yachts entering New Zealand.

MAFBNZ also attended a function in Whangarei in November for the seasonal fleet of cruising yachties arriving in New Zealand. This was an opportunity to both share information and gain valuable insights into the lifestyle and hull cleaning habits of this group to help inform future communication.

Currently, MAF inspects all yachts when they arrive in New Zealand. Inspectors note any biofouling on parts of the hull they can see from the wharf, and may direct a badly fouled vessel to be hauled out of the water.

To enable inspectors to examine the entire hull more carefully, once formal controls are in place, MAFBNZ is trialling an underwater camera system that includes an extendable pole, flexible head to check around the rudder and propeller, and lights for use at night and in murky water.

The planned controls would also allow inspectors to take action if a vessel was found to have an unacceptably high level of biofouling, including requiring cleaning at facilities that met MAF's biosecurity standards. Vessels would be lifted from the water and all biofouling removed. Large material, such as seaweed and mussels, would be removed and disposed of at a landfill, and smaller organisms would be retained in tanks and filtered before waste water was released into the environment or recycled. Approved cleaning facilities would ultimately be required near every port receiving international yachts.

An alternative to hauling vessels out of the water might be to use floating enclosure systems into which dirty vessels could be driven. The water could be drained and, if necessary, chemicals added – for example, acetic acid (vinegar) or bleach – to kill all biofouling. MAFBNZ has recently commissioned a study into the feasibility of using such an option, including examining a system to neutralise chemicals and cleanup water before discharge back into the ocean.

At present, there is a lack of cleaning facilities in the Pacific Islands. As most New Zealand bound vessels depart from the Islands, it may prove useful to work with Pacific Island countries to provide better marine biosecurity protection to the region, for example, assisting major marinas to establish safe cleaning facilities.

■ Dr Chris Denny, MAFBNZ, chris.denny@maf.govt.nz

Extreme biofouling on a yacht from Wellington harbour. Photo: MAFBNZ.

Cling-ons on the starboard bow: the biosecurity risks of vessel biofouling

Biofouling is the accumulation of marine plants and animals that inevitably occurs on hard substrates such as rocks, wharf piles and vessel hulls submerged in sea water.

Species that foul vessels are a particular biosecurity concern because they are able to be transported well beyond their native range and have the potential to invade new habitats.

Of the non-indigenous marine species known to have arrived in New Zealand, about 87 percent probably arrived as biofouling[1]. While not all of these new arrivals obviously impact on the receiving environment, some have had significant impacts.

Globally, non-indigenous marine species have impacted on economic, environmental and socio-cultural values by smothering, displacing, or re-engineering native species, habitats and infrastructure.

In New Zealand, high-impact introductions that were probably made via biofouling include the sea squirts *Didemnum vexillum* (fouling aquaculture in the Marlborough Sounds), *Styela clava* (now widespread in several New Zealand locations) and *Eudistoma elongatum* (fouling beaches in the Bay of Islands), as well as the Japanese kelp *Undaria pinnatifida* (modifying habitats throughout New Zealand).

In order to reduce the biosecurity risk associated with vessel biofouling, MAF Biosecurity New Zealand (MAFBNZ) has commissioned research to better understand and manage the problem. Investigations into biofouling on commercial, passenger and recreational vessels have been completed, with investigations of slow-moving and fishing vessels in progress (see page 16).

Analysis of the results to date has shown that every type of vessel is likely to have some biofouling associated with it, but in many cases the level of biofouling over the bulk of the hull will be negligible.

The biosecurity risk is most likely to be high on vessels that are moored for extended periods, travel at low speeds and/or have little need to maximise operational efficiency or speed. The vessel classes that most commonly have these attributes are recreational vessels, barges and specialist craft such as oil rigs.

Niche areas (such as sea chests and internal seawater systems), where organisms may find shelter from disturbance and/or a lack of any antifouling system, have been found to pose a substantial biosecurity risk despite accounting for a relatively small proportion of the hull.

Globally, niche areas have been found to carry a substantial number and diversity of organisms, and are considered one of the key issues in developing appropriate risk minimisation controls.

Samples of the fauna found at the base of an oil rig's leg. Photo: Cawthron Institute.

Fouling in the sea chest of a commercial vessel. Photo: John Lewis.

The number of niche areas on a vessel will depend on the complexity of the underwater structure of the vessel and its operation. Vessels such as semi-submersible oil rigs, which have complex subsurface structures, spend extended periods moored in a single location and are difficult to clean, will not only have many potential niche areas but also considerable opportunity to develop a substantial biofouling community. Once a biofouling community begins to develop a three-dimensional structure (in other words, progression beyond a slimy layer to larger organisms such as weed, barnacles, mussels, etc), it starts to create further niche areas that, in turn, allow a greater diversity of organisms to colonise, including mobile species such as crabs and even fish.

Some solutions to minimise vessel biofouling, such as biocidal antifouling paints (poisonous to marine life), have been available for many decades because there is a commercial imperative to keep hulls free from biofouling and maximise operational efficiency (a slime layer 1 millimetre thick can cause a 15 percent loss in ship speed[2]). However, the application of different types of antifouling paint to match the different conditions encountered on different parts of the hull or in niche areas is a relatively new development.

Similarly, the use of in-water cleaning for in-service maintenance of the hull has a long history. However, the need to balance the requirements of keeping a vessel clean with those of minimising the discharge of both biological and chemical contaminants into the receiving environment is a reasonably recent development.

Various design solutions, such as rounded bars on sea chest grates or the recessing of sacrificial anodes, are also available but until now have not been widely used as this is not critical for operational efficiency. MAFBNZ is moving ahead with developing border measures to mitigate the risks associated with vessel biofouling (see page 4). However, it is recognised that unilateral measures are unlikely to be effective (see also page 3).

Consequently, New Zealand has been involved at the International Maritime Organisation (IMO) to develop international measures that will minimise biofouling on vessels.

International guidance should not only aid countries in their attempts to mitigate the risks of non-indigenous marine species introductions, but also provide an imperative for ship owners, operators and those that service them to develop novel solutions to the problem.

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1 Kospartov K; Inglis G; Seaward K; Brink A van den; D'Archino R; Ahyong S (In Press) *Non-indigenous and cryptogenic marine species in New Zealand. Current state of knowledge – Interim report prepared for MAFBNZ Post Border Directorate. MAFBNZ*, Wellington, New Zealand.

2 Lewthwaite, J C; Molland, A F; Thomas, K W (1984) *An investigation into the variation of ship skin frictional resistance with fouling. Transactions of the Royal Institute of Naval Architects* 127: 269–284.

THE "NUMBER-8 WIRE" APPROACH TO REDUCING BIOFOULING RISK

Case Study: using hot water blasting as a low-tech, cost-effective treatment for biofouling on a large commercial vessel.

While antifouling coatings are used widely in commercial shipping for efficiency gains, fouling organisms can still occur on specific areas of vessels, known as niche areas. These include the dry dock strips on keels, and seawater intakes and anchor wells.

Manual removal is often the principal management tool used for the large-scale control of vessel biofouling, often involving the scraping of the vessel's hull to remove organisms. On larger or modified vessels, for example those with dredge arms, this methodology may not be enough.

MAF Biosecurity New Zealand (MAFBNZ) Senior Adviser (Marine) Justin McDonald has recently joined the organisation from the Western Australian Department of Fisheries. Prior to this, he worked as a marine consultant where one of his projects involved travelling to Singapore to "clear" a vessel for entry into Australia. During this "clearance" Dr McDonald, along with West Australian fisheries staff, oversaw the use of a hot water blasting method to deal with niche area fouling.

The vessel involved was the *Lange Wapper*, a trailing suction hopper dredger around 130 metres long. It was in dry dock in Singapore and due to visit Australia. An introduced species survey was required prior to the vessel entering Australian waters, with full examination of all underwater sections of the dredge.

Worker in bow thruster intake pipe using pressurised boiling water to kill biofouling within bow thruster cavity. (Note: the pressure cleaner is inserted almost completely within the cavity to target fouling.)

A crew had been assigned to clean the vessel using traditional scraping methods prior to the inspection. The majority of the vessel was scoured clean and had a new coating of antifouling paint. The exceptions were the manually inaccessible areas of the bow thruster cavity (see photos).

The cavity is part of a sleeve that encases the bow thruster intakes. Normally the bow thruster intakes and cavity are not examined, especially if an in-water inspection is conducted, because it requires oxy-acetylene tools to cut metal bars and climbing into a relatively narrow tube.

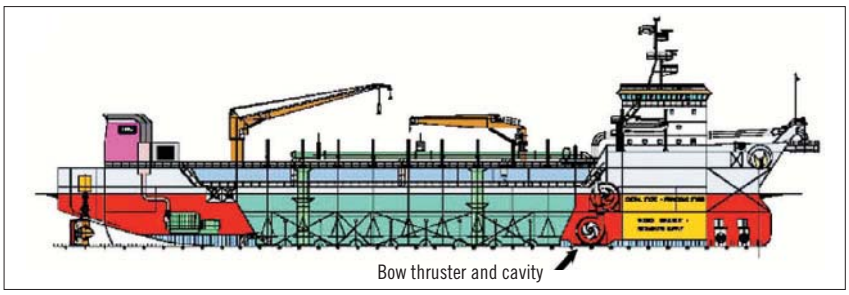
The bow thruster cavity was found to contain significant colonies of the recognised pest species the Asian green mussel (*Perna viridis*) and two acorn barnacle species.

As the bow thruster cavity could not be reached by traditional manual means, other pest organism treatments, such as submersion in vinegar (acetic acid), were considered. Use of a vinegar solution in a location such as the bow thruster cavity was, however, restricted as the method requires immersion of organisms in the solution for 12 hours or more. Because of the nature of the bow thruster and cavity, the immersion technique was impractical and a different technique for removing the organisms was required.

The pressure was on to find a solution as Singapore Harbour is extremely busy and the vessel had to be out of dry dock the next day. There was, however, no way the vessel would get clearance to enter Australia in its fouled state.

Using what was at hand, Dr McDonald and a crew of contractors managed to route boiling water from the ship's boiler to a high-pressure water blaster cleaner like that used to clean cars.

Hot water has been advocated as a treatment for ballast water (Mountfort et al, 1999). The water used in this instance was 130 celsius at the source



Above: Schematic of *Lange Wapper* showing location of bow thruster.
Top left: Invasive barnacles and mussels visible around the cavity opening were in even greater numbers within the cavity.
Bottom left: *Perna viridis* (Asian green mussel) removed from bow thruster intake pipes on dry dock floor.

and in excess of 80 celsius when it reached the bow thruster area. The water entering the cavity, and the duration of the treatment, was such that the surrounding metal of the thruster intake tubes were too hot to touch. The hot water treatment continued until all visible organisms had been killed, characterised by detachment from the boat surface (mussels only) and their bleaching (barnacles and mussels). This took around an hour.

The master and crew were unaware of how great a risk a "simple" patch of mussels could pose if introduced into non-endemic waters. In fact, when informed of the potential impacts, they were appalled that they may have unintentionally introduced them to Australia. The cooperation of the master and crew in this process ensured that the vessel left Singapore for Australia free of biofouling.

The promotion of marine pest awareness to vessel masters and crews, and simple use of low-tech, cost-effective treatment methods, such as this, could lead to more comprehensive cleaning taking place. This could, in turn, reduce the risk of species being introduced to non-endemic waters and mean faster turnarounds in future clearance inspections, saving both clients and inspectors time and money.

■ Dr Justin McDonald, Senior Adviser (Marine), MAFBNZ, justin.mcdonald@maf.govt.nz

Reference

Mountfort, D O; Hay, C; Taylor, M; Buchanan, S; Gibbs, W; (1999). Heat treatment of ship's ballast water: development and application of a model based on laboratory studies. *Journal of Marine Environmental Engineering* 5, 193-206.

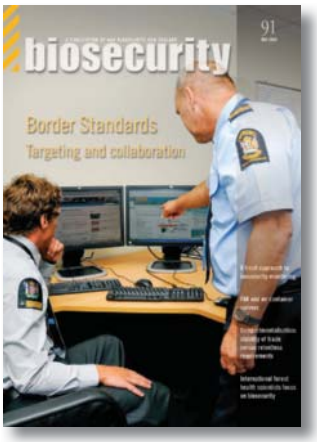
HAVE YOUR SAY ABOUT *BIOSECURITY* MAGAZINE

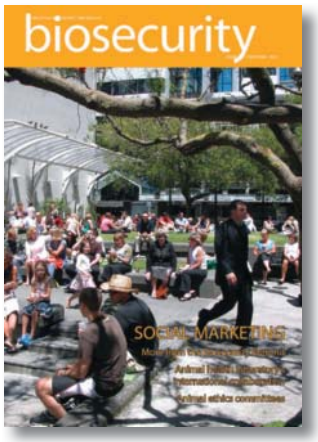
MAF Biosecurity New Zealand is surveying *Biosecurity* magazine readers to find out if the publication is continuing to meet readers' needs and what improvements could be made. To achieve this, we'd like to hear how you use the magazine, how satisfied you are with the current format and suggestions for improvements.

We invite readers who are currently receiving their own copy of *Biosecurity* magazine to take part in an online survey at: www.maf.govt.nz/biosecurity-survey (make sure you type in the whole of the web link highlighted in blue and you will be taken straight to our survey). If you have any problems accessing the survey please contact MAFSurveys@maf.govt.nz.

The survey will close on **31 July 2009** so please be sure to give us your feedback before this date. Whether you have a little or a lot to say, your opinion is important to us and will contribute to the future of the magazine.

We would like to thank everyone in advance for their time and look forward to hearing your views.





Acting in the marine environment through partnerships

Partnerships between government and non-governmental organisations are proving a sound platform for helping protect New Zealand's marine environment, writes MAF Biosecurity New Zealand's Bob Johnston, Lou Hunt and Jennie Brunton.

National and regional partnerships

Many organisations and individuals have an interest in protecting our marine environment from damaging pests. It is therefore desirable that all interested parties – central and local government agencies, iwi, industry and other stakeholders – act together to pool expertise and resources, and work collaboratively towards common goals.

MAF Biosecurity New Zealand (MAFBNZ) co-ordinates a national marine partnership framework called STOMP (Stop the Spread of Marine Pests).

The goal of the partnership is to improve marine pest management capability over time, including an increased level of protection for high-value marine areas. This includes:

- raising awareness about marine pest management and how organisations and individuals can contribute to this;
- developing marine pest management capability across central and regional government and industry;
- preventing and slowing the spread of marine invasive species and mitigating the impacts of these, where feasible and affordable.

STOMP functions as an umbrella group for several regional partnerships that are being established around the country. These regional partnerships are at various stages of development – a summary for each follows.

Top of the South

The pilot programme for regional partnerships is the Top of the South Island – covering coastline administered by the Nelson City Council and Marlborough and Tasman District Councils.

The Top of the South Partnership, co-ordinated by MAFBNZ, includes representation from the three councils, the Ministry of Fisheries (MFish), Department of Conservation (DoC), aquaculture industry, port companies, tangata whenua and other stakeholders.

The partnership has developed a strategic plan that identifies priority actions to prevent the introduction and minimise the spread of damaging marine species. The council partners have all supported the strategic plan and agreed to provide ongoing funding to implement it, and MAFBNZ has committed ongoing funding. This is the first time such a joint funding approach has been agreed for marine biosecurity management in New Zealand.

A locally based co-ordinator is being contracted for the partnership programme, whose responsibilities will include assisting with:

- developing advocacy programmes;
- engaging with marine users;
- identifying high-value areas to protect;
- identifying high-risk pathways and vectors for pest spread; and
- developing and promoting surveillance programmes.

Top of the North

The Top of the North Partnership also aims to build marine biosecurity capacity to stop the spread of marine pests. To date, the focus of this partnership has been collaborating on operational activities as MAFBNZ builds networks with potential regional partners for the future.

Information sharing has been the key outcome, with a MAFBNZ marine biosecurity webpage set up, workshops held in the region to extend knowledge of marine pests, and numerous local initiatives undertaken to promote stopping the spread of marine pests. Marine biosecurity information has been given to advocates engaged through the Coromandel Marine Farming Association and Northland Regional Council; the Marina Operators' Association is working with MAFBNZ to distribute "clean boating" and "clean marinas" guidelines (see page 12); and regional events such as boat shows and cruising club events have been attended to promote marine biosecurity best practice.

This increase in awareness of marine pest management has resulted in vessels carrying marine pests being intercepted on arrival at a local port.

Priority actions for the next year include continued improvements to information sharing, developing regional surveillance and promoting operational guidelines for tidal grid use.

Chatham Islands

The Chatham Islands Marine Partnership is the newest of the regional marine partnerships. The partnership's potential members include MAFBNZ (co-ordinator), Environment Canterbury, the Chatham Islands Council, DOC, MFish, iwi, the Chatham Islands fishing industry, shipping and port companies.

Like other partnerships, this one will focus on prevention activities and changing people's behaviours, and will target primary pathways by which marine pests can spread, for example, vessel fouling.

Fiordland

The Fiordland Marine Biosecurity Partnership consists of representatives from MAFBNZ, DOC, MFish, Ministry for the Environment (MfE), Environment Southland and the

Fiordland Marine Guardians (the Guardians). Each of the central government agencies is responsible for collaboratively implementing the Fiordland Marine Conservation Strategy that was developed by the Guardians.

Under the conservation strategy, MAFBNZ has worked with the other agencies and the Guardians to develop a Fiordland Marine Biosecurity Strategic Plan.

The Cawthron Institute is also developing a Risk Management Operational Plan for the Fiordland Marine Area, which will be implemented over the next five years. The plan proposes that most effort be directed to vector management, with supporting measures around surveillance, agency co-ordination, and communications for education and behaviour change.

A great deal has already been learned from an interim operational programme that began in 2007. This programme consists of generic measures (education campaign, vessel inspections, compliance and pest control) to reduce the immediate risk of potential marine pests from Southland spreading into Fiordland. The interim programme will inform the longer-term operational activities.

In addition, MAFBNZ, DoC and Environment Southland are working collectively to develop a Joint-agency Marine Biosecurity Response Agreement. This agreement will provide a framework for investigating and responding to marine risk organisms that are detected in the Fiordland Marine Area.

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Recreational vessels: options for managing biosecurity risks

Recreational vessels are increasingly being linked with the introduction and spread of some high profile pest species, such as didemnum and undaria, writes Paul Sheldon, Nelson City Council's Environmental Monitoring Co-ordinator.

Vessels moored in-water are a particular biosecurity concern because they:

- remain idle for long periods and can get heavily affected by pest species;
- are often slow moving, meaning associated fouling assemblages tend to survive vessel passage rather than being dislodged;
- often visit high-value sites such as marine reserves and aquaculture sites;
- are largely unmanaged for biosecurity risks.

In response to these concerns, the Nelson City Council, with funding from the Foundation for Research, Science and Technology (FRST) Envirolink medium advice grant scheme, has commissioned the Cawthron Institute to conduct a "think piece" to stimulate discussion on marine biosecurity risks associated with recreational vessels at the Nelson marina.

The resulting report, *Options for Managing Biosecurity Risks from Recreational Vessel Hubs* (Cawthron Report No. 1591, April 2009), was authored by Richard Piola and Barrie Forrest. The report identifies two broad management options:

- control of the source population of a pest(s) within the marine environment itself; and
- direct management of vectors (vessels).

The report considers vector management to be the most realistic and achievable, but notes that the two approaches are not mutually exclusive.

The report provides several options and recommendations:

- introduce a regular antifouling regime – every 12 months – with the possibility of a Warrant of Fitness sticker or displayable document indicating compliance;
- introduce a regime of regular vessel inspections to identify high-risk vessels;
- ensure that appropriate resources (for example, facilities and expertise) are available for treatment;
- consider the implementation of a biosecurity levy to recover costs;
- introduce public awareness programmes; and
- introduce management of swing moorings and tidal grids.

The report was commissioned to consider options for Nelson in particular, and is not necessarily a template for other regions. However, the issues it addresses are widespread, and some of the management options presented may be applicable elsewhere.

The report's recommendations will be used by the Nelson City Council in its review of the terms and conditions for berth-holder agreements at the Nelson marina, which includes consultation with boat owners.

Paul McArthur, the Council's manager of parks and facilities, expects the review to be completed within the next 12 months.

For a copy of the report, see the Envirolink website at www.envirolink.govt.nz – click on the "reports" tab and report number 607.

■ Paul Sheldon, Environmental Monitoring Co-ordinator, Nelson City Council, paul.sheldon@ncc.govt.nz

Marinas and MAFBNZ working together for marine biosecurity

New Zealand's marina network is working closely with MAF Biosecurity New Zealand (MAFBNZ) to help protect our coastal environments from the impacts of marine pests.

The New Zealand Marina Operators' Association is phasing in an international environmental initiative known as the Clean Marinas programme and is working to incorporate biosecurity information in the process.

The programme embraces the many aspects of environmentally friendly boating, including sewage management, boat refuelling, bilge water and boat cleaning, and incorporates the world's best practice in terms of sustainability in the marine environment.

It is designed for both individual boaties and marina operators. Operators participate through a self-assessment audit programme, while for individual boat owners the emphasis is more on education.

Information will be shared with boaties through online resources and printed fact sheets, which will be widely distributed through marina offices, mail outs and boat shows. Future plans include the concept of "dock walkers" or face-to-face advocates, working in and around marinas, engaging boaties in conversations about best practice, and sharing information and products/giveaways.

Marina Operators' Association spokesman Brett Colby says the programme is a good example of an industry-led programme developed by industry for industry.

"We aim to offer practical, cost effective solutions to everyday operational issues. Facilities who can demonstrate they consistently use best management practices to reduce environmental impacts will be designated as a "Clean Marina" and be awarded a specific level of achievement within the nationally recognised accreditation programme."

Mr Colby says that in terms of environmental education, his organisation is in a prime position to become the conduit

between the boating fraternity and environmental agencies promoting best practice and environmental concerns. "We already have a number of marinas throughout the country pledging their commitment to the Clean Marina programme."

The wider Clean Marinas programme is supported by the Auckland Regional Council through its Coastal Enhancement Fund, which allocates funding annually to projects that improve the coastal environment.

Now MAFBNZ is on board, it is working in partnership with the marinas to produce a Clean Boating booklet. The booklet will contain full information on biosecurity best practice, including effective boat cleaning and the importance of thorough antifouling. It will also stress the potential impacts of pest species, the need for cleaning to be carried out in facilities with waste containment, and guidelines for environmentally sound use of tidal maintenance grids.

The relationship has developed through the work of the Top of the North Partnership programme, which sees MAFBNZ working with regional councils, local industries, iwi and government agencies to improve marine biosecurity in the upper North Island – New Zealand's boating hub.

Find out more about the Clean Marinas programme at: www.cleanmarinas.org.nz

- Specific information for boaties is at: www.cleanboating.org.nz

Marine Value Mapping: questions of *what, why* and *where*

MAF Biosecurity New Zealand (MAFBNZ's) obligation to safeguard New Zealand's marine environment from pests and diseases is a challenging task.

Marine borders are hard to manage because there is no single physical point of arrival – for example, organisms living on a vessel's hull (biofouling – see pages 4 and 8) have the potential to disperse into New Zealand's coastal waters as a ship makes its way into port.

To make matters even more difficult, water acts as a visual and physical barrier – surveillance activities are no simple task, and neither are efforts to collect general information on underwater ecosystems.

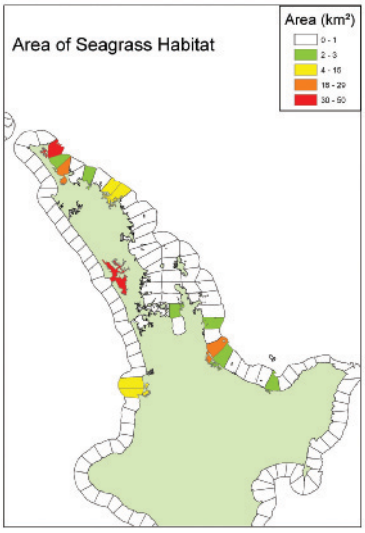
Given the challenges and limitations of working in an underwater environment, it is not surprising that significant components of marine biodiversity are undescribed or yet to be discovered.

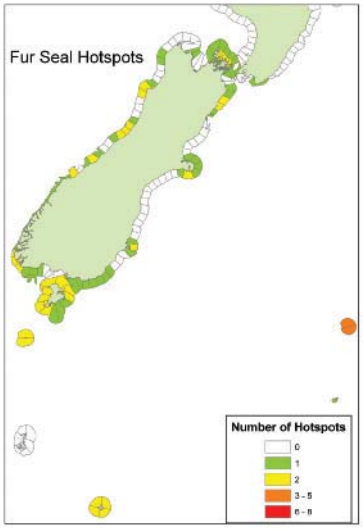
To effectively manage biosecurity risks to New Zealand's marine environment, it is critical that we have an understanding of what is at risk. Fundamental questions are "What do we want to protect?, Why do we want to protect it? and Where is it?"

Knowing the identity, importance and location of "core values" allows government agencies to better anticipate potential impacts to the environment, and this knowledge can be used to prioritise management and inform decision making.

To address this information need, MAFBNZ, in conjunction with the Department of Conservation (DoC), co-ordinated a research programme to identify and map a range of sub-components for each of the following marine core values:

- environmental – for example, habitat types, protected areas and species distributions;
- economic – for example, coastal land value and commercial fishing;
- social – for example, recreation sites and amenity value; and
- cultural – for example fishing grounds such as taiāpure and mātaitai.





Examples of some of the environmental value mapping datasets.

A series of expert focus groups and hui were used to identify a range of sub-components for each of the four marine core areas as indicated above. The focus groups comprised a broad range of participants, each with specific expertise in the marine sciences, valuation theory and marine resource management. They included leading New Zealand scientists, economists, sociologists and representatives from several coastal iwi.

For each of the selected sub-components, the focus groups identified the methods and information available for assessing their characteristics ("value") and locations. Relevant data holdings were then acquired, with a focus on sources that were freely available through sharing agreements, or within the public domain.

In the final phase of the projects, the data was collated and then synthesised in a Geographic Information System (GIS) to produce maps of the core value sub-components.

Although information on the distribution of coastal resources has already been assembled in geographic databases, in many cases it is fragmented among a range of national and regional authorities. This project is aimed towards consolidating spatial information on coastal values into a single, national source. The environmental and economic workstreams have been completed (reports are available at www.biosecurity.govt.nz/about-us/our-publications/technical-papers), and the social and cultural projects were scheduled to be completed in June 2009.

The project is the first systematic attempt to identify and map components of value (environmental, economic, social and cultural) in relation to New Zealand's coastal marine ecosystem. The comprehensive database of marine resources and their relative values can be applied to a variety of coastal zone impacts. In this way, the project will have wide benefits to coastal resource managers, including central and local government, scientists, researchers and environmental decision makers.

It is also expected that the project will have additional conservation and management benefits outside the biosecurity perspective.

■ Dr Dan Kluza, Senior Adviser, Risk Analysis (Marine), MAFBNZ, daniel.kluza@maf.govt.nz

ELIMINATION OF FANWORM PROCEEDS IN LYTTELTON PORT

Work is underway on a $3.5 million programme aimed at eliminating the marine pest Mediterranean fanworm from Lyttelton Port of Christchurch.

MAF Biosecurity New Zealand (MAFBNZ) detected the Mediterranean fanworm (*Sabella spallanzanii*) last year during its routine surveillance programme of checking ports of entry to New Zealand for a suite of high-risk pests. The fanworm is an introduced species that has the potential to harm New Zealand's coastal marine environment.

MAFBNZ's contractors on the elimination programme, Diving Services New Zealand, and the National Institute of Water and Atmospheric Research (NIWA) have recently completed the first treatment cycle in the port's waters (although initial work scoping the scale of the infestation also involved treatment by removing all fanworms found).

Treatment involves divers systematically searching for individual fanworms, and, where found, manually removing them. This methodology has been demonstrated by research to be the best means of reducing and ultimately eliminating the worm. Areas searched include wharf piles, pontoons, some vessels and even areas of seabed.

During the latest treatment round, in April, divers retrieved some 64 fanworms – a result Response Manager Dr Peter Stratford says is an expected outcome this early in the elimination programme.

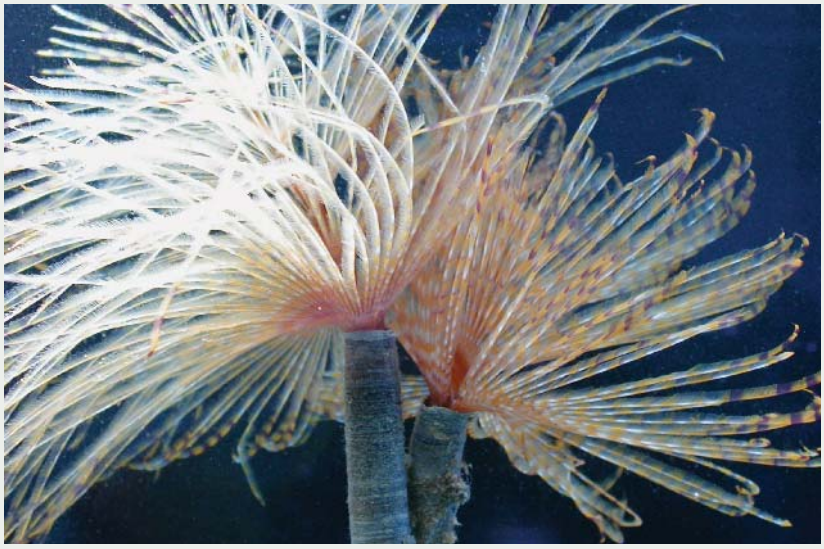
In addition to the treatment programme, a fanworm surveillance programme is also in place in the Lyttelton Port area. The surveillance differs from the treatment in that it involves a partial inspection of a large number of wharf piles with the express purpose of rapidly identifying the likely spread of the fanworms throughout the port – whereas treatment thoroughly searches the entirety of each and every wharf pile within the identified treatment site.

This two-tiered approach allows the allocation of the treatment effort to areas where it is most needed, for example, where the fanworms are being found. Any fanworms found during surveillance are also removed for further examination.

The most recent surveillance round, undertaken in May, found a further 26 specimens from more than 1200 piles inspected throughout the Lyttelton Port area, including one on the Cashin Quay wharf – the port's large container vessel wharf, and outside the semi-enclosed port area.

Dr Stratford says the find is not considered to impact significantly on

"Treatment involves divers systematically searching for individual fanworms, and, where found, manually removing them. This methodology has been demonstrated by research to be the best means of reducing and ultimately eliminating the worm."



Sabella spallanzanii.

the overall elimination programme at this stage.

"The fanworms that have been removed from the port are now being examined to determine their reproductive status and size distribution. This information is useful as it will help us determine when the fanworms are likely to breed, so we are able to plan further treatment activities around those times," he says.

In order to rid Lyttelton of the pest, it is expected several treatment and surveillance cycles will be required. The cycles are planned for about every three months, and may continue for two years. The next full treatment round is scheduled for June 2009.

The programme will, however, be reviewed in October this year to ensure the treatment remains effective.

"It is hoped that the entire port will have been inspected by the October review period, so we'll have a good idea of how the programme is performing by then," Dr Stratford says.

As well as the search and removal operation, work is also underway on a separate scientific study to give MAFBNZ a better understanding of whether there are any hidden populations of the fanworms that the divers are unable to detect. This project involves placing 20 structures, (called settlement plate arrays) made up of small PVC panels (or tiles) and rope tassels, strategically around the inner Lyttelton port. The theory is that if there are any fanworm larvae floating around in the water, they can settle on these structures. The structures can then be retrieved after six weeks and carefully studied to determine if any new fanworms have grown.

"If small fanworms are found, we will know there are more adults in the area that we have not yet found. If no juvenile fanworms are found, it may indicate that the population is struggling to reproduce successfully," says Dr Stratford.

"The use of this 'tool' is still experimental, but along with the diver searches, it forms part of the range of techniques we're using in this attempt to eliminate the fanworm."

MAFBNZ is also urging the owners and operators of boats moored in Lyttelton to continue to keep up good maintenance programmes on their vessels.

If vessels have anything more than a light slime layer on their hull (for example, a furry layer or actual barnacles, mussels, etc), they are at risk of picking up the fanworm – and other marine species – and spreading them to new, potentially high-value areas.

"Areas particularly at risk are other parts of the wider Lyttelton Harbour, the nearby Marlborough and Nelson areas, Stewart Island and Fiordland – all with high value tourism, unique environmental assets or marine farming industries."

MAFBNZ is also running an education programme targeting Lyttelton vessel owners and port users. This includes direct information drops to berth holders, a club evening to talk to boaties, signs in the port and at marina berths and targeted advertising in boating and fishing publications.

The message is simple – keep your hull free of fouling and maintain a good coating of antifoul paint.

■ Dr Peter Stratford, Response Manager, MAFBNZ, peter.stratford@maf.govt.nz

FISHING FOR MARINE BIOSECURITY THREATS

The first study in the world to comprehensively look at biofouling across vessel types is being carried out by MAF Biosecurity New Zealand (MAFBNZ).

A new season is underway for the cutting-edge Vessels Biofouling project – this year focusing on fishing boats.

Non-indigenous marine species that can impact on New Zealand's environment and people are most likely to arrive as biofouling on vessels. MAFBNZ has been determining the relative risks associated with vessel biofouling through a systematic sampling of international vessels since 2004. The risks associated with commercial, passenger, recreational and slow-moving vessels are becoming clear but information on fishing vessels has been lacking.

Fishing vessel sampling started in 2006 but only three vessels were sampled because changes in fishing quotas and regulations meant fewer international fishing vessels were entering the New Zealand Exclusive Economic Zone (EEZ) to fish and port.

To understand the risks fishing vessels pose to biosecurity, the scope of the survey has been readjusted to better reflect these patterns. Previously only foreign flagged vessels entering the EEZ, fishing, and then leaving, were considered. Now international and domestic vessels that have worked outside of, or are passing through, the EEZ are considered.

MAFBNZ has contracted the Cawthron Institute in Nelson to sample fishing vessels arriving from international waters to the ports of Auckland, Nelson and Timaru. These ports were chosen because they have the most consistent international arrivals of fishing boats.

MAF border staff advise scientists at Cawthron when a boat is about to arrive, and a team then surveys the vessel. Sampling began in February and will be completed by December. Six boats have been sampled so far, of an expected total of at least ten.

Sampling is voluntary, and involves underwater divers systematically

continued on next page ›

HAVE YOUR SAY – Commercial harvest of undaria

MAF Biosecurity New Zealand (MAFBNZ) is seeking feedback on possible options to allow greater commercial use of the introduced Asian seaweed undaria (*Undaria pinnatifida*) without significantly increasing its adverse impacts on the marine environment.

Undaria, an exotic pest seaweed, was accidentally introduced to New Zealand in the mid-1980s. It is now found in most ports and harbours along the east coast of New Zealand as well as in Taranaki, the top of the South Island, Stewart Island and Snares Islands/Tini Heke. Its distribution around New Zealand is a combination of spread from the initial introduction as well as additional introductions.

In its edible form, undaria is commonly known as "wakame" and can be used for salads, fish and meat dishes, and in soups and accompaniments. There is also increasing promotion in the health food and pharmaceutical markets because antiviral compounds from undaria have been found to inhibit the herpes simplex virus. Other uses include as fertiliser and fish food.

Currently, undaria is allowed to be commercially harvested when taken as part of a control programme or as a by-product of another activity, for example, mussel farming. Some parties are interested in widening the type and scope of situations where it would be legal to commercially harvest the seaweed.

MAFBNZ has developed a discussion document for public comment that looks at the following three options:

Option 1: Harvest as part of control or by-product operations only (status quo)

This option prohibits farming.

Option 2: Harvest anywhere undaria has naturalised, but excluding farming

This option would allow harvesting anywhere undaria has naturalised, including natural substrates, artificial surfaces, floating or beach cast. Option 2 prohibits farming.

Option 3: Harvest anywhere undaria has naturalised, farming only in highly infested areas

This option would allow harvesting anywhere undaria has naturalised as in option 2. Option 3 would also allow farming in areas already heavily infested with undaria.

Submissions on the discussion document must be received by MAFBNZ no later than **5pm on Friday 31 July 2009**. Information on the submission process is included within the discussion document.

- Copies of the discussion document are available at www.biosecurity.govt.nz/biosec/consult or contact Maria Cassidy at maria.cassidy@maf.govt.nz or (04) 894 0403.

gathering information on biofouling amounts, locations and species. Diving teams record and collect organisms found on the hulls, which are later identified by experts (Figures 1, 2 and 3). The captain is given a questionnaire that asks for information on the boat's characteristics (for example, length and cruising speed), maintenance regime (such as type of antifouling paint and date of last clean) and voyage history (last 20 ports and dates of layover). This data will be analysed for trends that may help prevent future arrivals of non-indigenous animals in New Zealand through biofouling.

A review of marine biofouling, non-indigenous marine species, and their impacts is presented by MAFBNZ Adviser, Risk Analysis (Marine) Dr Andrew Bell on page 6. General trends of vessel biofouling from analysis so far are also presented, as well as recent developments and thinking in the sphere of vessel biofouling.

Although biofouling on the bottom of vessels is known to have introduced non-indigenous species into New Zealand and around the world, little research has been done on it.

"This is the first study of its kind in the world to comprehensively look at biofouling across vessel types," MAFBNZ Senior Adviser, Risk Analysis (Marine) Dr Daniel Kluza says.

MAFBNZ's work not only benefits New Zealand but is also feeding into international attempts to understand the issues and risks involved in biofouling, for example, the Biofouling Correspondence group of the International Maritime Organisation (see page 3).

■ Simon Philips. Adviser, Risk Analysis (Marine), MAFBNZ, simon.philips@maf.govt.nz

Figure 1: Fishing boat at dock, being refuelled and about to be surveyed for the Vessel Biofouling project.

Figure 2: Scuba divers taking photo-quadrats on the boat's hull.

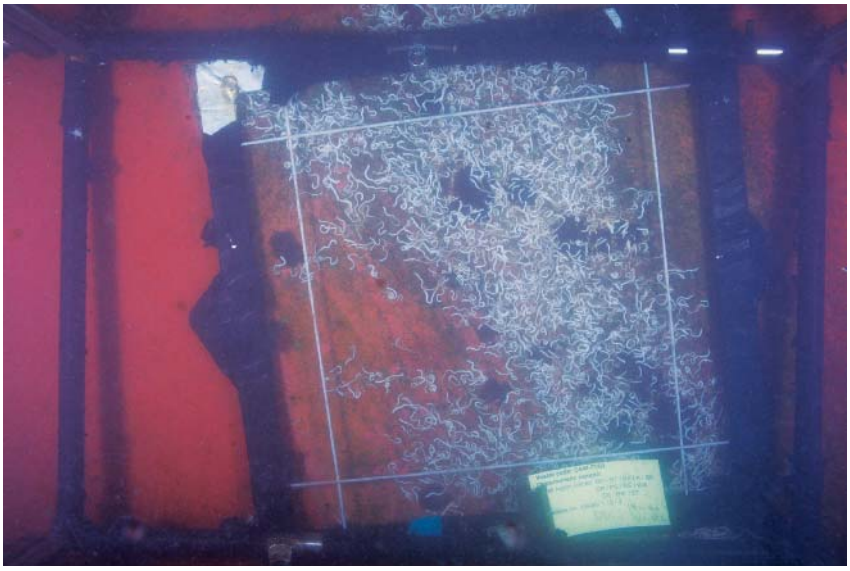


Figure 3: A patch of biofouling on an area of clean hull. The white squiggles are shell tubes of worms.

All photos courtesy of Cawthron Institute.

AQUATIC ANIMAL DISEASES AND DIAGNOSTICS

MAF Biosecurity New Zealand (MAFBNZ) is constantly increasing its ability to detect aquatic diseases that could damage New Zealand's environment and economy.

MAFBNZ capacity in aquatic animal diagnostics

Just like marine pests, it is important to be able to detect and identify diseases and pathogens of aquatic animals (fish, molluscs and crustaceans). Aquatic animals play an important role in the environmental, economic, social and cultural welfare of New Zealand. MAFBNZ, through its Investigation and Diagnostic Centres (IDCs), provides an aquatic animal diseases diagnostic service.

The IDC at Wallaceville houses both the Marine Incursion Investigator, who responds to reports from the MAF hotline (0800 80 99 66), and the Animal Health Laboratory (AHL) where the diagnostic tests are carried out.

Diagnostic tools used at Wallaceville include pathology, immunology, bacterial culture and virus isolation on fish cell lines. These classical diagnostic disciplines are supplemented by the increasing use of molecular tests (looking for the nucleic acids of pathogens).

The aquatic diagnostic team deals with a wide variety of cases every year, from straightforward testing of salmon for export, to complex investigations of shellfish mortalities and, of course, the fascinating clinical oddities that crop up from time to time in the aquatic population.

It is increasingly clear that capability in aquatic animal health has a significant role to play in the biosecurity of New Zealand. In fostering a cross-MAFBNZ approach, a Principal Adviser in aquatic animal diseases has just been appointed and is based within the AHL.

Thinking globally: international aquatic animal health

Aquatic animal health is a global issue. Not only does it affect the environment and productivity of aquatic natural resources worldwide, but there are trade implications too.

MAFBNZ is represented by AHL staff on the Australian Sub-committee on Aquatic Animal Health (SCAAH) and the Animal Quads aquatic animal health working group (a joint Australia, Canada, New Zealand and US group). Both these groups deal with broad national and international aquatic animal health policy development and collaboration.

In addition, IDC provides technical and policy input to the World Organisation for Animal Health (OIE), both as a member country and through the Principal Adviser's invited membership of OIE working groups.

Acting locally: advancing diagnostics for New Zealand

Not only does the laboratory carry out diagnostic tests, it also develops new ones, constantly improving MAFBNZ's diagnostic capacity.

Aquatic animal bacteriology diagnostics is complex and often fails to follow clearly defined text-book scenarios. MAFBNZ recognised the need to develop and validate rapid diagnostics for specific aquatic animal bacterial diseases. Initially four bacterial diseases were chosen based on identification of risk pathways:

- *Aeromonas salmonicida* and *Yersinia ruckeri*, which have had significant impacts on salmon in northern hemisphere countries. These diseases were chosen because of the importance of protecting New Zealand's salmon industry, which has an export value of $44 million in 2008[1].
- *Streptococcus iniae* and *Lactococcus garvieae*, which may enter New Zealand via the ornamental fish trade, and pose a risk to the health of multiple marine and freshwater finfish species

While aquarium keeping can be great fun and a rewarding hobby, ornamental fish are a potential threat to New Zealand's fisheries industries, native fish and other wildlife. More than 1000 exotic freshwater and marine fish species are permitted to enter into New Zealand and 1.2 million fish are imported each year.

Reports have emerged in recent years that highlight the risk of disease spread associated with the global ornamental fish trade, particularly those caused by iridoviruses.

Iridoviruses are emerging pathogens that affect various animals in fresh and salt water. The virus causes serious disease outbreaks in natural and cultured environments. Iridoviruses also infect amphibians and reptiles and, along with fungal infection and habitat destruction, have contributed to amphibian population decline around the world. The ability of iridoviruses to infect various types of hosts is a cause for concern as they can spread readily to new host species.

A project is currently being completed to develop molecular diagnostic tests to rapidly and accurately detect iridoviruses. Scientists at Wallaceville have succeeded in developing DNA-based tools to detect both major groups of iridoviruses responsible for fish and amphibian mortality.

We've got the paua: we want to keep them

Readers may be well aware of the viral disease causing concerning mortalities in wild abalone in Victoria, Australia. New Zealand paua are related to the Australian abalone so MAFBNZ determined that full diagnostic capacity for this emerging disease, called abalone viral ganglioneuritis

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1 Scientific papers for publication in peer reviewed journals are currently in preparation.

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(AVG), should be developed at Wallaceville.

While advanced clinical disease could be diagnosed using histopathology and electron microscopy, MAFBNZ had no way of detecting the pathogen in mildly affected animals or those paua not showing clinical signs at all.

Scientists are nearing the end of a two-year project on the AVG virus, funded by MAFBNZ, and working in collaboration with the Australian Animal Health Laboratory. As a result, the diagnostic laboratory now has a range of rapid and accurate diagnostic tools to detect the disease in the absence of clinical signs.
(The assistance of the Paua Industry Council Ltd with this project is gratefully acknowledged.)

Dirty bottoms: are they a disease risk for New Zealand?

Internationally, there is an ongoing focus on the pest risk posed by biofouling on shipping, oil rigs and barges. But there is also evidence to suggest that some fouling organisms, such as bivalve shellfish, could carry diseases to another country.

To investigate this risk pathway, the Wallaceville AHL is running a project to introduce and validate diagnostic tools for detecting pathogens in biofouling organisms, and is looking at hundreds of biofouling animals to see if there is evidence of pathogens of significance to New Zealand.

The project is still in its early days, but progress has been made in validating the tools and sourcing appropriate reference material from around the world. Information from studies such as this one will inform New Zealand's input into the work of the International Maritime Organisation (IMO) on biofouling and ballast water management.

A platform for continued development

Working with aquatic animal diseases is a dynamic and rapidly developing area, and it is vitally important that improvements in diagnostic capability continue.

The validation and implementation of the advanced diagnostic tools discussed above has increased MAFBNZ's diagnostic capability and provided an excellent platform on which to continue building capability in the area of aquatic animal pathogens of significance to New Zealand.

For more information see:
www.biosecurity.govt.nz/pests/animals/ahl/aaddt

■ Dr Colin Johnston, Principal Adviser, Aquatic Animal Diseases, MAFBNZ, colin.johnston@maf.govt.nz

New principal adviser for aquatic animal diseases

Colin Johnston was recently appointed MAF Biosecurity New Zealand (MAFBNZ) Principal Adviser, Aquatic Animal Diseases.

Based within the Investigation and Diagnostic Centre (IDC) Animal Health Laboratory at Wallaceville, Dr Johnston diagnoses diseases of fish, molluscs and crustaceans using pathology, bacteriology, virology and DNA technologies. He is also involved in developing new diagnostic methods for diseases of significance to New Zealand.

Dr Johnston represents New Zealand on the Quads aquatic diseases working group (a joint Australia, Canada, New Zealand and US group) and the Australian Sub-committee on Aquatic Animal Health (SCAAH). He sits on a World Organisation for Animal Health (OIE) working group on the biosecurity safety of commodities from aquatic animals and has been an invited speaker on fish welfare by both the Royal Society of New Zealand and the RSPCA Australia.

A veterinarian, Dr Johnston has worked full-time with aquatic animals for more than 12 years, and is a member of the Australian College of Veterinary Science by examination in aquatic animal diseases. In 2006, he was made an examiner in aquatic animal diseases for the College.

Dr Johnston joined MAFBNZ in 2006, where he worked in Policy and Risk before his move to the Wallaceville IDC. He was previously the Veterinary Manager for a large UK aquaculture company, responsible for the health and welfare of 45 million fish across almost 60 farms. He then moved to Australia, where he became the General Manager, Aquatic Resources, with the Government of South Australia. He had carriage of the State aquatic animal health and aquaculture resource management programmes and oversight of the State Government-funded aquaculture management research programme.

Dr Johnston's appointment as Principal Adviser will enable him to provide advice across MAFBNZ and become more involved in coaching and mentoring other staff.

BIOSECURITY ESSENTIAL TO NEW ZEALAND'S AQUACULTURE SUCCESS

Biosecurity magazine asked Aquaculture New Zealand for its views on the importance of protecting New Zealand from pests and diseases, and the challenges ahead. As Research Manager Mike Mandeno writes, New Zealand's reputation as a producer of healthy seafood from a clean and pristine environment needs to be guarded vigilantly.

Located far from heavily populated and polluted areas, clean waters and spectacular coastlines, make New Zealand one of the most ideal countries for growing seafood. Stringent quality assurance programmes work to guarantee the high quality of New Zealand's aquaculture produce.

Biosecurity is an essential element in the sector's continued success. Be it within the farming or processing phases, a biosecurity event can have a lasting commercial effect with the added reputational risk well beyond the event.

The aquaculture sector is extremely vigilant. The reason for the vigilance is threefold with possible outcomes seeing the industry being one of the following: victim, competitor or vector – or all three.

Aquatic pest species can be among the most challenging. This is because of logistical difficulties with working in the aquatic environment – difficulties with detection and because of the ability of some organisms to reproduce and disperse via microscopic life stages. This is especially true for marine fouling pests. These types of pests can overgrow aquaculture stock and natural communities with serious adverse effects. However, to other marine users such species may be completely unseen.

Marine aquaculture's location within the public domain introduces a layer of complexity absent for some terrestrial pests. Within the marine environment there is a range of human vectors and artificial structures under various types of ownership. All have the potential to mediate the spread of introduced pests. However, there is no common incentive to ensure owners keep the environment free of pest species.

With new marine incursions, the visitor has often taken the opportunity to adopt a travelling host. By the time wider ecological effects of an incursion are realised, the opportunity for eradication will probably be gone. This introduces a need for robust and precautionary initial assessments of likely effects, especially ecological effects.

The optimal approach is to prevent new incursions altogether through pre-border and at-border protection measures. However, such measures are subject to international agreements and take considerable time to establish.

There is an ongoing need for measures to control and eradicate new incursions. Effective systems require the co-operation of all user groups – including marine farmers, commercial operators and recreational users. However, not all user groups are easily motivated to behave responsibly.

As occupants of public space, the aquaculture sector can be at risk from a variety of factors, the majority of which are easily identifiable and monitored for, with the support of the relevant agencies and deliverers. It is in the sector's interest to ensure the water in which its produce grows is as clean as possible and stays that way. It is also important for New Zealand Inc, as an event can have a damaging, if not fatal, effect on commercial enterprises.

New Zealand's marine environment is unique and vast. It is also economically, ecologically and socially important. Protection of this vast environment from unwanted pests requires a vigilant, responsive, robust and integrated biosecurity system. This will rely on clear incentives for responsible behaviour by all users.

There is a lot at stake. Aside from the range of values that can be affected by marine pests, at risk is New Zealand's reputation as a producer of healthy seafood from a clean and pristine environment. This is one of our natural competitive advantages, and one that should be guarded vigilantly.

- Aquaculture New Zealand, based in Nelson, was formed as a single voice for the New Zealand aquaculture sector and to implement the industry strategy released in 2006, which outlines the industry's vision and goals to 2025. The Strategy sets out a 10-point plan identifying the steps the organisation will be taking to work with the sector to achieve the vision of being a $1 billion industry by 2025. Aquaculture New Zealand brings together individual species bodies, the New Zealand Mussel Industry Council, New Zealand Salmon Famers' Association and the New Zealand Oyster Industry Association. Primarily funded through an industry levy, the organisation is focused on legislative reform and the creation and implementation of research and development and market development strategies. This work is underpinned by a focus on sustainability and recognition of the current and future role of Māori in the development of the industry.
  See www.aquaculture.org.nz for more information.

FIRST SALTWATER CROCS EMIGRATE TO NZ

New Zealand Food Safety Authority (NZFSA) vets were close at hand for the import of New Zealand's first saltwater crocodiles.

Goldie and Scar arrived at Whenuapai Air Force base on a Hercules on Tuesday 21 April at 11.55pm. Both saltwater crocs were caught in the wild in Australia before living in crocodile farms. Goldie hails from North Queensland and Scar from the Northern Territory.

Scar, weighing in at more than 450 kilograms, and Goldie, at 420 kilograms, are both about 40-years-old. Scar is 4.8 metres in length and Goldie not far behind, measuring 4.5 metres.

The night they arrived in New Zealand was freezing – our first cold snap of the year – and these crocs sure had a shock – coming from temperatures in the mid-thirties to Auckland's winter of single digits.

The crated crocs were off-loaded from the Hercules and hoisted onto a truck. From Whenuapai they were escorted by NZFSA vets to Butterfly Creek, a zoo and tourism/hospitality facility near Auckland Airport.

The real fun began as Goldie and Scar were craned off the truck and over the Butterfly Creek railway, then slid along scaffolding frames into their new enclosures.

First out was a slightly chilled Scar. It took a while for him to warm up, but he soon began to move, promptly wedging himself between one of the rocks and the exhibit barrier, before easing himself into his heated pool. Then it was

Goldie's turn. He came out still having some rope stuck on his tooth. Once he had warmed up he also went into the water (which is heated to at approximately 31 degrees), where he thrashed around a bit to dislodge the rope. All was finally over at 4.30am.

The crocs were in quarantine for seven days and monitored by NZFSA vets for that period. The quarantine period ended on 29 April, and the pair have been on public view since late May.

Goldie and Scar are fiercely territorial and so need to be kept in separate enclosures. Both are doing well in their new homes. Goldie seems to be the more confident of the two – very active from his early days here and dining on some great New Zealand chicken breast and pork belly.

Len Brown, Manukau City Mayor, will officially open the crocodile exhibit on 2 July.

■ Andrea Smith (nee Plume), MAFBNZ, andrea.plume@maf.govt.nz

Protecting the driest, coldest, windiest continent

Antarctica New Zealand has been working with the Ministry of Agriculture and Forestry (MAF) to better understand and manage biosecurity threats to Antarctica. Melanie Newfield, Senior Adviser, Risk Analysis, visited Scott Base in February.

Mount Erebus from the top of Crater Hill. Photo by Melanie Newfield, MAFBNZ.

While a lot of attention has been given to the protection of Antarctica, biosecurity has not been a priority until relatively recently. There is now increasing concern about biosecurity threats, especially when combined with the impact of climate change.

In a place where most of the biodiversity is microscopic or hidden under ice, most of the threats are also likely to be microscopic or hidden, making the risks much harder to understand and assess. Most are also likely to be hitchhiker species, meaning that they are more difficult to predict. MAF's experience in risk analysis and managing hitchhiker organisms is therefore relevant in assessing and managing risks to Antarctica.

Work with Antarctica New Zealand goes back some years and was initially focused on managing people and specimens returning from Antarctica. Attention has now turned to better biosecurity protection. MAF's contribution to this has included identification of intercepted organisms by its Investigation and Diagnostic Centres (IDCs), advice from the

View from Robert Falcon Scott's hut at Cape Evans. Photo by Melanie Newfield, MAFBNZ.

"The Tane Mahuta of Ross Island" – lichen near Scott Base. Photo Jana Newman, Antarctica New Zealand.

Post-Border Directorate on managing a fly incursion at Scott Base, involvement in an international workshop on non-native species in the Antarctic in 2006, and advice from Risk Analysis on assessing and prioritising biosecurity risks.

Antarctic biodiversity – Weddell seal. Photo by Melanie Newfield, MAFBNZ.

Mount Erebus with road-marker flag. Photo by Melanie Newfield, MAFBNZ.

Scott Base, on Ross Island, is the centre for New Zealand's activities in the Antarctic. During the late spring and summer months there are three flights a week bringing people and cargo to the base. Once a year a cargo ship and a fuel tanker bring additional supplies. Occasional tour ships also visit the area. Although it is a remote location, there are still many opportunities for non-native species to be transported to Antarctica.

However, once a new species arrives it has to contend with Antarctica's most effective biosecurity measure – the climate. The driest, coldest and windiest continent on earth is a hostile place to most life, but a surprising number of species are able to cope with extreme conditions.

A small number of introduced species have taken advantage of human-modified environments, for example, flies have sometimes established and become a nuisance in heated buildings.

Some species have adapted to surviving the worst weather and grow only when conditions are favourable, and it is these kinds of species that are likely to be the most serious threat. One of the main biosecurity threats may be native Antarctic species that are inadvertently transported to new locations by human activities.

The biodiversity of Antarctica is not as obvious as the lush forests and fields that cover New Zealand, but it is diverse and unique. Around Scott Base the obvious life is seals and skuas (large birds related to the gull family), while on other parts of Ross Island there is an abundance of penguins.

Also found in tiny pockets around Scott Base and McMurdo Station are lichens, algae and mosses. Some of the lichens found just centimetres from tracks could be more than 1000 years old, and could be destroyed by a careless footprint.

Other species include small invertebrates such as nematodes (roundworms), springtails and mites, soil-inhabiting fungi and bacteria that survive in thermal areas on active volcanoes such as Mount Erebus. Diverse and remarkably colourful marine communities are found under the sea ice in water with an average temperature of about –2 celsius (the salt content lowers the freezing point of the water below zero).

The unique position of Antarctica, as the world's least modified wilderness and a "non-country" where the main human activity is scientific research, also means that the biosecurity threats to Antarctica need to be considered in a way that is different from biosecurity threats to a country like New Zealand.

When assessing the risks to New Zealand, MAF has clear guidance about

Iceberg at Cape Bird. Photo by Melanie Newfield, MAFBNZ.

Unloading a United States Airforce C-17 Globemaster at Pegasus Airfield (Ross Ice Shelf). Photo by Melanie Newfield, MAFBNZ.

what values it is trying to protect. Documents such as the Biosecurity Act 1993, Biosecurity Strategy and the MAF Statement of Intent state the aim of protecting New Zealand's economy, environment and people (both human health and social/cultural values). One of the areas where Antarctic biosecurity differs is that "wilderness" and "science" are central to what is valued about Antarctica.

Just as transport of people and cargo to New Zealand has associated biosecurity risks, so does transport to Antarctica. New Zealand is a recognised leader in biosecurity, and that means there are high expectations as well as opportunities to provide international leadership on protecting Antarctica from biosecurity threats.

With MAF and Antarctica New Zealand working together, the experience of both organisations can contribute to protecting one of the world's most unique and special places.

■ Melanie Newfield, Senior Adviser, Risk Analysis, MAFBNZ, melanie.newfield@maf.govt.nz

Antarctic biodiversity – Adelie penguins at Cape Bird. Photo by Melanie Newfield, MAFBNZ.

MV American Tern docked at the port at McMurdo Station. Photo by Melanie Newfield, MAFBNZ.

Keeping an eye out for the pine sawyer beetle

Pine plantation. Photo courtesy USDA Forest Service.

MAF Biosecurity New Zealand (MAFBNZ) recently completed a two-year seasonal surveillance programme for the serious forestry pest Japanese pine sawyer beetle, *Monochamus alternatus* (longhorn beetle), following detection of a single live adult beetle. No pine sawyer beetles were detected by the programme.

The Japanese pine sawyer beetle is a vector of the pinewood nematode (roundworm), *Bursaphelenchus xylophilus*, which causes pine wilt disease (PWD) (Figure 1).

This disease has destroyed large tracts of Asian pines and is recognised internationally as one of the most harmful forestry diseases in the world. In light of this significant threat to New Zealand forestry, the Japanese sawyer beetle is classified as a Notifiable Organism under the Biosecurity Act 1993.

A single live adult beetle was detected in a warehouse at Cambridge in December 2007. At the time of detection, eight wooden reels of wire rope had recently arrived from China and a further 60 wooden reels from previous consignments were also stored inside the warehouse.

Following detection, the warehouse and reels were inspected by a MAFBNZ officer. No evidence of sawyer beetle activity was found in any of the eight reels although one of them had several large holes and frass (insect debris) inside it. The eight reels were fumigated and incinerated. All reels had the International Standards for Phytosanitary Measures (ISPM) MB stamp, which showed they had been fumigated in China using methyl bromide.

To ensure no live beetles remained in the warehouse, it was fog treated with an insecticide. A residual insecticide spray was applied to the wall–floor junction as an additional precautionary measure. The beetle was later identified by the MAFBNZ Plant Health and Environment Laboratory (PHEL) Investigation and Diagnostic Centre (IDC) as *Monochamus alternatus*.

To determine whether any pine sawyer beetles had escaped from the warehouse or populations had established, MAFBNZ contracted AsureQuality to conduct lure-based surveillance. The surveillance was

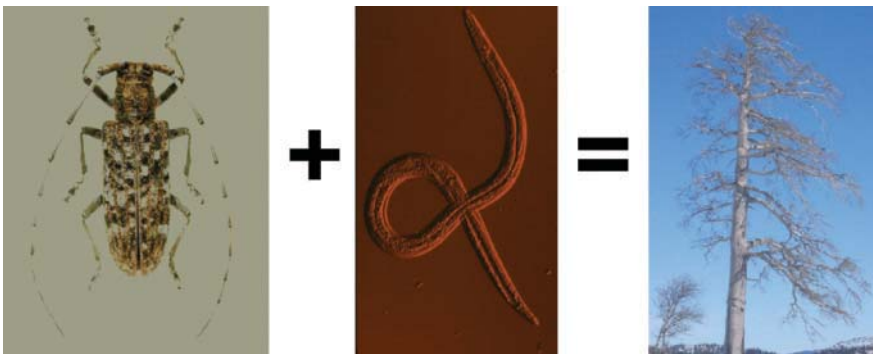

Figure 1: Pine sawyer beetle, pine wood nematode and dead pine tree. Photos courtesy www.animalpicturesarchive, Halik & Bergdahl and Astrid Lied respectively.

"This disease has destroyed large tracts of Asian pines and is recognised internationally as one of the most harmful forestry diseases in the world."

conducted within a 500 metre radius of the warehouse over the summer–autumn seasons in 2008 and 2009. (The adult beetles travel between 50 and 260 metres in their lifetime.)

Results

Tests carried out by PHEL on the solitary pine sawyer beetle showed it was not infected with the pinewood nematode.

No pine sawyer beetles were caught in either survey although other beetles known to occur in New Zealand were trapped, indicating the method was effective in attracting beetles.

The results from the lab testing, the treatments applied at the warehouse and the surveillance programme, provide confidence that neither the nematode nor the pine sawyer beetle is established. It is likely that the beetle detected was a solitary individual originating from one of the eight imported wooden reels.

MAFBNZ has informed key stakeholders of this detection, the actions undertaken and results of the surveillance. MAFBNZ Border Standards group has been informed of the risks associated with the pathway of entry, in particular the effectiveness of ISPM stamped wooden items.

Conclusions

PWD would pose a serious threat to New Zealand pine forests should it arrive here. Overseas records show that the pine wood nematode has not only been found in packaging wood imported from areas where it is known to occur (United States, Japan, Korea, Hong Kong, Taiwan and Portugal), but also from countries considered to be free of this pest (Brazil, Thailand, Belgium, Netherlands, Italy and Spain).

Global circulation of wooden packaging material among infested and non-infested countries is a major means by which the nematode is spread around the globe. Currently all wood packages coming into New Zealand are subjected to ISPM 15.

Considering that other longhorn beetles could act as potential vectors for the nematode, constant vigilance and quick responses are required to prevent this disease from establishing in New Zealand.

- Emmanuel Yamoah, Plant Response, MAFBNZ, emmanuel.yamoah@maf.govt.nz
- Travis Ashcroft, IDC, MAFBNZ, travis.ashcroft@maf.govt.nz
- Diane Jones, IDC, MAFBNZ, diane.jones@maf.govt.nz

NETS 2009 – Remarkable Changes

This year's New Zealand Biosecurity Institute conference (NETS) will be held in Queenstown 14–16 October at the Rydges Hotel.

The conference theme – "Remarkable Changes" – recognises both Queenstown's remarkable location and the remarkable changes that have taken place in pest management and biosecurity over the past 30 years. The conference will also explore some of the changes we may see in biosecurity in the coming years.

If you intend to be involved in biosecurity in the future, you should be in Queenstown for NETS 2009.

Highlights include speakers such as John Hellstrom – one of New Zealand's forward thinkers in biosecurity, and Professor Phillip Hume from the Bio-Protection and Ecology Division at Lincoln University. There will also be the opportunity to learn about biosecurity issues from those at the coal face of pest management.

The landscape of Central Otago has also seen remarkable changes over time – some not necessarily for the better. The scheduled field trips for NETS 2009 will showcase this amazing part of the country and the pressures it has had to contend with – from both pests and people.

To register for NETS 2009 go to the New Zealand Biosecurity Institute's website at www.biosecurity.org.nz

New Zealand Biosecurity Institute

RED IMPORTED FIRE ANTS ERADICATED FROM NAPIER

Following an intensive three-year surveillance programme, MAF Biosecurity New Zealand (MAFBNZ) declared the successful eradication of the Red Imported Fire Ant (RIFA) from Whirinaki, north of Napier, on 22 April 2009.

Red Imported Fire Ants (*Solenopsis invicta*) are considered one of the worst invasive insects and are the subject of control and eradication activities in many parts of the world. They have been declared an Unwanted and Notifiable Organism under New Zealand's Biosecurity Act 1993.

RIFA have been successfully eradicated from New Zealand on two previous occasions – from Auckland International Airport in 2001 and Ports of Napier in 2004.

Survey team with data logger in action.

Native to South America, Red Imported Fire Ants are capable of spreading across wide areas and can pose a direct threat to human health and lifestyles, as well as our native flora and fauna. The ants are tiny (2–6 millimetres long), reddish-brown in colour, are effective foragers and they are aggressive. If disturbed, they will sting to defend their nest and surrounding area, and the stings can be painful for both humans and animals.

A single RIFA nest of about 30,000 worker ants was discovered in the grounds of the Pan Pac Forest Products plant at Whirinaki, in June 2006 and was quickly destroyed. It remains unclear how the ants arrived, as Pan Pac is primarily an exporter and most of its imports come from Europe, which is free of fire ants.

Nest analysis has shown that dispersal by mated flying ants could have occurred in either, or both, the summers of 2004–05 and 2005–06. The flight distance of the RIFA queens from their nest is thought to be up to 2 kilometres.

A Controlled Area was put in place extending out in a 2 kilometre radius shortly after the Whirinaki nest was detected, restricting the movement of potential fire ant conveyors that could cause further spread. The Controlled Area was essential from a biosecurity point of view, but, while effective, caused extra work for businesses and locals living within the area.

The three-year eradication programme also included the following activities:

- Four complete rounds of surveillance involving visual inspections and the use of bait pottles containing a mixture of peanut butter, sausage meat and cotton wool soaked in a sugary water solution. The aim was to attract any ants living in the area into the pottles, which were collected and analysed to check for RIFA. A minimum of four baits per equivalent 10 metre x 10 metre grid (100 m^2) were laid out in a 2 kilometre radius of the nest find. Over 900,000 bait pottle samples were collected and checked for RIFA

AsureQuality field staff involved in the 2008–09 Red Imported Fire Ant surveillance programme.


Red imported fire ant.

A Controlled Area out to a 2 kilometre radius of the nest find was put in place shortly after the Red Imported Fire Ant nest was detected in June 2006.


Red Imported Fire Ant mound detected in the grounds of Pan Pac Forest Products plant in Whirinaki, Napier, June 2006.

over the three-year programme. Areas that could not be surveyed on foot were aerially treated with insecticidal ant baits.

- Six rounds of aerial treatments using insecticidal ant baits were applied to areas that could not be accessed on foot for surveillance activities.
- Regular monitoring of the area out to 200 metres from the original nest site.
- Regular passive monitoring using pitfall traps out to 200 metres from the original nest find. A pitfall trap consists of a teflon-coated tube containing 10 millilitres of ethyl alcohol buried in the ground. The top of the tube is flush with the surface to trap ants that fall into it. An elevated cover protects the pitfall to minimise rainfall entering the trap.
- Tracing of all known risk goods in and out of the Pan Pac site from the time the nest was believed to have established.

The success of the eradication programme was due in no small part to the co-operation and support of Pan Pac Forest Products staff, local businesses and the Whirinaki community. Special thanks also go to AsureQuality staff who carried out the operational activities, and Flybusters Antiants that provided the screening services for the eradication programme.

■ Sheree Christian, Adviser, Environmental and Marine Response, MAFBNZ, sheree.christian.@maf.govt.nz

Pest mosquito eliminated from Coromandel

MAF Biosecurity New Zealand (MAFBNZ) has recently declared the successful elimination of the Southern salt marsh mosquito (SSM) from the Coromandel area, ending some three years of treatment and surveillance activity.

The Australian mosquito can be a carrier of Ross River virus, which causes a severe flu-like illness in humans, and is also a vicious day-time biter.

The insect was first detected in New Zealand in Napier in 1998 and has been under treatment at several locations around the country since then. It has now been eliminated from all but one of these sites – Wairau, in Marlborough, where excellent progress is being made on its elimination.

SSM was first detected in the Coromandel in May 2006. Activities undertaken since then to locally eliminate the insect have included helicopter and ground treatment operations, trapping of adults and sampling for juvenile life stages.


S-methoprene insecticide granules are applied aerially as part of the Coromandel elimination programme.

MAFBNZ Incursion Response Manager David Yard says the successful elimination of the mosquito in the Coromandel is something to celebrate.

"MAFBNZ, and in the initial stages the Ministry of Health, have undertaken a comprehensive work programme against this aggressive mosquito. To be able to declare this success is significant considering the vast areas of ideal habitat the Coromandel provides for the pest," Mr Yard says.

He says the co-operation of local landowners contributed significantly to the success of the programme, and MAFBNZ is grateful for their help.

Now elimination has been declared in the Coromandel, the area comes under the control of the Ministry of Health, which administers an active national surveillance programme. This programme covers all of New Zealand to provide early detection of any exotic salt marsh mosquito, and will ensure that a sound level of ongoing surveillance is carried out in the Coromandel.

"DECLARE OR DISPOSE"

MAF Biosecurity New Zealand (MAFBNZ) implemented a targeted advertising campaign in May to remind airline passengers of their responsibility to declare or dispose of risk goods at the border. The campaign also acknowledges those who always declare correctly.

Key audiences are non-English speaking background New Zealanders (particularly Asian and Pacific Island audiences), and all New Zealanders who already comply with biosecurity requirements.

These two audiences were identified through passenger research (which focused on segmenting and understanding travellers' compliance decision making), and from passenger profiling data.

Why non-English speaking background New Zealanders?

These people tend to bring in high-risk items without understanding what our laws are and why they need to comply with them, and the need to declare or dispose.

Why those who already comply?

About 96 percent of international air travellers are compliant with border biosecurity requirements – that's around 4.4 million travellers annually. Reinforcing this compliant behaviour is important in order to maintain its high levels.

A range of channels in ethnic and mainstream media has been chosen to reach the various priority audiences. The schedule includes magazines and newspapers, web banners and radio advertisements. Supporting material will also be distributed at international departure lounges and arrival areas at airports, and through i-sites (Visitor Information Centres).

Several designs have been developed based on feedback from focus groups with the priority audiences, and the theme of respectful authority links them all. Print designs include two in an airport setting (one with an inspector and detector dog, the other with a family), one focusing on our beautiful environment, the other on sport.

Where appropriate, these designs have been translated in to the priority audience languages.

The key message is "Declare or Dispose. It is New Zealand law".

■ Kathy Dyer, Communications and Marketing Adviser, MAFBNZ, kathy.dyer@maf.govt.nz

Biosecurity magazine: OVERSEAS POSTING

Please note this is the last edition of *Biosecurity* magazine that will be posted to overseas addresses. (Copies will continue to be posted to New Zealand addresses.)

The magazine will continue to be available to read on the MAFBNZ website: www.biosecurity.govt.nz/publications/biosecurity-magazine/index.htm

DETECTOR DOGS TO BECOME STARS OF THE SMALL SCREEN

MAF Biosecurity New Zealand's (MAFBNZ's) detector dogs and their handlers are about to feature in a new television series based on the lives of working dogs.

The seven-episode series, to be called *Dog Squad*, is set to air next year and will also feature the work of dogs from the New Zealand Police and the Department of Corrections.

The show comes from the same production house that made the popular *Border Patrol* series.

Cream Media Company Director Nigel Snowden says *Dog Squad* will be strong on the relationship between dogs and their handlers, the working life of the dogs and the challenges they encounter as they go about their day-to-day business.

MAFBNZ is pleased with the opportunity to showcase the dogs' work, along with the chance to highlight its border messaging around not bringing biosecurity risk goods to New Zealand.

Dog Squad was set to begin production this month

PEOPLE IN BIOSECURITY

Kathy Walls joined MAF Biosecurity New Zealand (MAFBNZ) in April as Senior Adviser with the Environmental and Marine Response Team in the Post Border Directorate. Her background is in marine conservation and ecosystem-based management. Kathy worked for the Department of Conservation until 2006 when she took up a two-year position in Fiji as Director of the Wildlife Conservation Society's South Pacific Programme. She has an MSc (Hons) in marine biology and geography from the University of Auckland.

Sherman Smith has recently taken up a position as a Senior Adviser in the National Co-ordination Team, part of the Pest Management Group, Post Border Directorate. In this role he will contribute to the co-ordination of pest management across the biosecurity system. Sherman has a BSc in ecology and zoology from Massey University and worked initially as a nature guide in Arthur's Pass. He then spent four years in various roles with the Department of Conservation in Palmerston North. Most recently, Sherman worked for five years with Environment Southland as a biosecurity officer (pest animals), where he was involved in a wide range of pest management issues, from community-led environmental restoration projects to strategy reviews.

Laura Anderson has joined the Post Border Directorate Systems Design Group as Systems Co-ordinator, and is responsible for maintaining the Incursion Response System (IRS) application. IRS is the MAFBNZ system that supports quality operational decision making during responses, including visibility of surveillance, movement control, organism management and tracing operations. She is also responsible for assisting users to configure IRS effectively in a response. Laura recently moved to New Zealand from the United Kingdom, where she worked for the past 10 years in the information technology sector as a business analyst and then in technical consultancy, most recently holding responsibility for the design and implementation of web-based employee benefit packages.

Felicity Campbell has recently joined the Post Border Group as a Team Support Officer for the Surveillance Team. She is the new contact person for disease freedom statements, and administers the Transmissible Spongiform Encephalopathy (TSE) programme payments. Felicity has just returned from her OE in Europe, where she worked for the United Kingdom's leading property and investment company as a PA to the corporate communication team. Prior to leaving New Zealand, Felicity worked for Bayleys Real Estate, based in the Viaduct Harbour in Auckland, and won the organisation's Administrator of the Year prize. She also spent two years working for the Auckland City Council's Recreation and Community Events division and was involved in organising events, such as the multi-cultural festival Pasifika, and facilitating filming requests within the city.

UPDATES

DECLARATION OF COUNTRY FREEDOM FROM AVOCADO SUNBLOTCH VIROID

MAF Biosecurity New Zealand (MAFBNZ) has announced that New Zealand is free of the Avocado Sunblotch Viroid (ASBVd).

ASBVd is a disease that affects only avocados. It can be either symptomless or can display symptoms on the leaves, stems and fruit of avocado trees. ASBVd was believed to be present in New Zealand following testing undertaken during a subtropical crop survey in 1998–1999. However, subsequent independent testing has failed to detect the presence of this viroid.

Over the 2008–09 summer, MAFBNZ and the Avocado Industry Council worked together to develop a new MAF surveillance standard for ASBVd, incorporating international best practice in sampling and testing protocols. All sites that had tested positive to ASBVd in 1998–1999 were re-surveyed using the latest DNA technology and have tested negative.

A full article on the survey is scheduled to be included in the next edition of *Biosecurity*.

NOTICE OF REVOCATION OF APPROVED ANIMAL IDENTIFICATION SYSTEM

Pursuant to section 50 of the Biosecurity Act 1993 and regulations 8 and 9 of the Biosecurity (Animal Identification Systems) Regulations 1999, I give notice of revocation of the following approved animal identification system:

AgriQuality Animal Identification System, also known as AgriTags, administered by AsureQuality Ltd (formally AgriQuality Ltd).

This notice modifies the Notice of Approved Identification Systems for Bovine Tuberculosis Control (notice number 1571) notified in the *New Zealand Gazette* No 167, 7 December 2006.

Dated at Wellington this 26th day of May 2009.

Peter Thomson
Director, Post-Border
Ministry of Agriculture and Forestry
(Acting under delegated authority)

The operation of the AgriTags scheme ceased on 13 February 2009 with relevant information transferred to the Animal Health Board to support the bovine tuberculosis pest management strategy.

EGG POWDER IHS CONSULTATION

As part of the consultative process in the development of the import health standard (IHS) for egg powders from specified countries, MAF Biosecurity New Zealand (MAFBNZ) has distributed the following draft document for public consultation and comment: **draft import health standard for shelf-stable spray dried egg powders or egg crystals from specified countries.**

This document can be viewed on the MAFBNZ website at: www.biosecurity.govt.nz/biosec/consult

An IHS for egg powders from specified countries has been drafted to review the mitigation measures and heat treatment requirements for these commodities in light of the recent import risk analysis (IRA) for egg powders from all countries. This draft IHS combines several existing IHSs for various egg powders from Canada, the United States, Australia and European Union member countries.

Comments on the draft document should be forwarded to MAFBNZ by close of business on **Friday 26 June 2009**.

MAFBNZ encourages respondents to forward comments by email to: aurelie.castinel@maf.govt.nz or AnimalImports@maf.govt.nz

Submissions can be posted to: Aurelie Castinel, Animal Imports, MAF Biosecurity New Zealand, Ministry of Agriculture and Forestry, PO Box 2526, Wellington, New Zealand, or faxed to +64 4 498 0662.

IMPORTATION OF SEED FOR SOWING

MAF Biosecurity New Zealand has issued a minor amendment to the *Hordeum* and *Triticum* schedules within the import health standard: 155.02.05 Importation of Seed for Sowing. This standard is dated 7 May 2009. The revised import health standard is available on the MAFBNZ website: www.biosecurity.govt.nz/files/ihs/155-02-05.pdf

No significant changes have been made to the import requirements for *Hordeum* and *Triticum* seeds. Amendments to these schedules provide further clarification of the options available for importing seeds.

Pest watch: 1 April 2009 – 22 May 2009

Biosecurity is about managing risks – protecting the New Zealand environment and economy from exotic pests and diseases. MAF Biosecurity New Zealand devotes much of its time to ensuring that new organism records come to its attention, to follow up as appropriate. The tables here list new organisms that have become established, new hosts for existing pests and extensions to distribution of existing pests. The information was collated between 1 April and 22 May 2009. The plant information is held in the Plant Pest Information Network (PPIN) database. Wherever possible, common names have been included.

ANIMAL KINGDOM RECORDS

Validated new to New Zealand reports

No new to New Zealand records during this period.

Significant find reports

No significant find records during this period.

New host reports

No new host records during this period.

New distribution reports

No new distribution records during this period.

- If you have any enquiries regarding this information please email NZBiosecuritySurveillance@maf.govt.nz

PLANT KINGDOM RECORDS

Validated new to New Zealand reports

Organism	Host	Location	Submitted by	Comments
Caliphis hickmani (mite)	*Actinidia deliciosa* (kiwifruit)	Auckland	IDC (export pre-clearance)	
Helleborus net necrosis virus (HeNNV)	*Helleborus* sp. (winter rose, lenten rose)	Waikato	IDC (general surveillance)	
Narcissus latent virus (NLV)	*Narcissus* sp. (narcissus)	Dunedin	Literature	
Obolodiplosis robiniae (gall midge)	*Robinia pseudoacacia* (false acacia)	Auckland	Scion (high risk site surveillance)	
Vallota mosaic virus (ValMV)	*Nerine* sp. (Guernsey lily)	Auckland	Operational research (flower bulb survey)	
Alstroemeria mosaic virus (AlMV)	*Alstroemeria* sp. (Peruvian lily)	Auckland	Operational research (flower bulb survey)	
Hippeastrum mosaic virus (HiMV)	*Hippeastrum* sp. (hippeastrum)	Auckland	Operational research (flower bulb survey)	
Hyacinth mosaic virus (HyaMV)	*Hyacinthus* sp. (hyacinth)	Wanganui	Operational research (flower bulb survey)	
Iris mild mosaic virus (IMMV) *Iris potyvirus 2* (no common name)	*Iris* sp. cv. Wedgewood (iris)	Wellington	Operational research (flower bulb survey)	
Ornithogalum mosaic virus (OrMV)	*Iris tingitana* (iris)	Wellington	Operational research (flower bulb survey)	
Ornithogalum potyvirus (no common name)	*Ornithogalum* sp. (Star of Bethlehem)	Wellington	Operational research (flower bulb survey)	
Ornithogalum stripe mosaic virus (OrSMV)	*Ornithogalum thyrsoides* (Star of Bethlehem)	Wellington	Operational research (flower bulb survey)	
Ornithogalum necrotic mosaic virus (OrNMV) *Veltheimia mosaic virus* (VeMV)	*Lachenalia* sp. (lachenalia)	Wanganui	Operational research (flower bulb survey)	
Tulip mosaic virus (TulMV)	*Tulipa* sp. (tulip)	Wanganui	Operational research (flower bulb survey)	
Zantedeschia mild mosaic virus (ZeMMV)	*Zantedeschia* sp. (calla lily)	Wellington	Operational research (flower bulb survey)	
Freesia leaf necrosis virus (FLNV)	*Freesia* sp. (freesia)	Auckland	Operational research (flower bulb survey)	

Significant find reports

Organism	Host	Location	Submitted by	Comments
No significant find records during this period.				

New host reports

Organism	Host	Location	Submitted by	Comments
Aphelenchoides ritzemabosi (chrysanthemum foliar nematode)	*Symphytum* sp. (ornamental comfrey)	Auckland	IDC (general surveillance)	
Bactericera cockerelli (tomato/potato psyllid)	*Capsicum frutescens* (cayenne pepper)	Auckland	IDC (general surveillance)	
	Physalis peruviana (cape gooseberry)	Hawkes Bay	IDC (general surveillance)	
Bedellia psamminella (insect: moth, no common name)	*Muehlenbeckia australis* (pohuehue)	Wellington	Scion (other indigenous)	
Bionectria ochroleuca (fungus: no common name)	*Michelia yunnanensis* (no common name)	Northland	IDC (general surveillance)	
Cylindrocladium pacificum (fungus: no common name)				
Phytophthora cinnamomi (phytophthora root rot)				
Botryosphaeria parva (botryosphaeria rot)	*Tilia europaea* (European linden)	Wellington	Scion (high risk site surveillance)	
Botryosphaeria stevensii (diplodia rot)	*Fraxinus angustifolia* (narrow-leaved ash)	Auckland	Scion (high risk site surveillance)	
Calliprason pallidus (pallid longhorn beetle)	*Pinus patula* (Patula pine)	Auckland	Scion (high risk site surveillance)	
	Agathis microstachya (bull kauri)			
Candidatus Phytoplasma australiense (Coprosma lethal decline)	*Solanum tuberosum* cv. Russet Ranger (potato)	Waikato	IDC (Liberibacter)	
Cardiaspina fiscella (brown lace lerp)	*Eucalyptus propinqua* (eucalypt)	Wanganui	Scion (high risk site surveillance)	
Trachymela sloanei (small eucalyptus tortoise beetle)				
Lily symptomless virus (LSV)	*Lilium regale* (Christmas lily)	Mid-Canterbury	IDC (general surveillance)	
Tulip virus X (TVX)				
Ceroplastes sinensis (Chinese wax scale)	*Teucrium fruticans* (tree germander)	Auckland	Scion (high risk site surveillance)	
Essigella californica (Monterey pine aphid)	*Pinus coulteri* (Coulter pine)	North Canterbury	Scion (exotic forest survey)	
Glomerella acutata (anthracnose)	*Asparagus officinalis* (asparagus)	Auckland	IDC (general surveillance)	
Glyptotermes brevicornis (dry wood termite)	*Fraxinus* sp. (ash)	Auckland	Scion (high risk site surveillance)	
Heliothrips haemorrhoidalis (greenhouse thrips)	*Ugni molinae* (strawberry myrtle)	Auckland	IDC (general surveillance)	
Lepidosaphes ulmi (apple mussel scale)	*Crataegus monogyna* (hawthorn)	Wellington	Scion (high risk site surveillance)	
Monteithiella humeralis (insect: bug, no common name)	*Pittosporum ralphii* (karo)	Wellington	Scion (high risk site surveillance)	
Parasaissetia nigra (nigra scale)	*Polygala* sp. (milkwort)	Auckland	Scion (high risk site surveillance)	
Parlatoria fulleri (scale)	*Macadamia tetraphylla* (macadamia)	Auckland	Scion (high risk site surveillance)	
	Tristaniopsis laurina (water gum)			
Oemona hirta (lemon tree borer)	*Syzygium paniculatum* (brush cherry)	Auckland	Scion (high risk site surveillance)	
	Chaenomeles sp. (flowering quince)	Wellington	Scion (high risk site surveillance)	

Organism	Host	Location	Submitted by	Comments
Parlatoria fulleri (scale)	*Ceratopetalum gummiferum* (Christmas bush)	Bay of Plenty	Scion (high risk site surveillance)	
	Macadamia tetraphylla (macadamia)	Auckland	Scion (high risk site surveillance)	
Phloeophagosoma thoracicum (cossonid weevil)	*Araucaria heterophylla* (Norfolk Island pine)	Auckland	Scion (high risk site surveillance)	
Phloeophagosoma thoracicum (cossonid weevil)	*Ulmus x hollandica* (elm)	Auckland	Scion (high risk site surveillance)	
Phytophthora citricola (phytophthora rot)	*Fagus* sp. (beech)	Southland	IDC (general surveillance)	
Porotermes adamsoni (termite)	*Salix* sp. (willow)	Auckland	IDC (general surveillance)	
Ornithogalum mosaic virus (OrMV)	*Iris* sp. cv. Wedgewood (iris)	Wellington	Operational research (flower bulb survey)	
Ornithogalum mosaic virus (OrMV)	*Ornithogalum thyrsoides* (Star of Bethlehem)	Wellington	Operational research (flower bulb survey)	
Pseudaulacaspis eugeniae (white palm scale)	*Corymbia calophylla* (Port Gregory gum)	Auckland	Scion (high risk site surveillance)	
Pseudococcus longispinus (longtailed mealybug) *Parlatoria fulleri* (scale)	*Lophostemon confertus* (brush box)	Auckland	Scion (high risk site surveillance)	
Tyrophagus curvipenis (mite)	*Persea americana* (avocado)	Bay of Plenty	IDC (export pre-clearance)	
Uraba lugens (gum leaf skeletoniser)	*Prunus domestica* (European plum)	Auckland	IDC (general surveillance)	
Uresiphita polygonalis maorialis (kowhai moth)	*Sophora howinsula* (kowhai)	Wellington	Scion (high risk site surveillance)	
Uromyces pisi (fungus: no common name)	*Teline monspessulana* (Montpellier broom)	Wellington	Scion (indigenous survey)	
Xylotoles sp. (longhorn beetles) *Sericotrogus subaenescens* (beetle: no common name)	*Foeniculum vulgare* (fennel)	Wellington	Scion (high risk site surveillance)	

New distribution reports

Organism	Host	Location	Submitted by	Comments
Bactericera cockerelli (tomato/potato psyllid)	*Cyphomandra betacea* (tamarillo)	Bay of Plenty	IDC (Liberibacter)	
	Solanum tuberosum cv. Rua (potato)	Taranaki	IDC (general surveillance)	
Balanococcus danthoniae (mealybug)	*Actinidia deliciosa* (kiwifruit)	Waikato	IDC (export pre-clearance)	
Botryosphaeria parva (botryosphaeria rot)	*Tilia europaea* (European linden)	Wellington	Scion (high risk site surveillance)	
Lily symptomless virus (LSV) *Tulip virus X* (TVX)	*Lilium regale* (Christmas lily)	Mid-Canterbury	IDC (general surveillance)	
Cosmospora sp. aff. *purtonii* (fungus: no common name)	*Myrsine australis* (mapou)	Wellington	Scion (indigenous survey)	
Cylindrocladium pacificum (fungus: no common name)	*Michelia yunnanensis* (no common name)	Northland	IDC (general surveillance)	
Dialectica scalariella (echium leaf miner)	*Echium candicans* (Pride of Madeira)	Wanganui	Scion (high risk site surveillance)	
Hysterographium fraxini (fungus: no common name)	*Fraxinus angustifolia* (narrow-leaved ash)	Wanganui	Scion (high risk site surveillance)	
Phytophthora citricola (phytophthora rot)	*Fagus* sp. (beech)	Southland	IDC (general surveillance)	
Septoria fuchsiicola (fungus: no common name)	*Fuchsia excorticata* (tree fuchsia)	Wellington Gisborne	Scion (high risk site surveillance)	

- If you have any enquiries regarding this information please contact NZBiosecuritySurveillance@maf.govt.nz

MAF general enquiries: 0800 00 83 33

Exotic disease and pest emergency hotline: 0800 80 99 66

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