Chapter 5: Biosecurity Risks

CONTENTS

Briefly 89

In depth 91

National overview 91

Biosecurity risks for Marlborough 94

Marlborough is vulnerable to the arrival of new pests 94

Pests can spread easily 94

Growth and development pressures 94

Impact of pests on indigenous biodiversity values 95

Impacts of pests on Marlborough's economy 95

Responding to biosecurity risks 97

Regional pest management strategy for Marlborough 100

Monitoring rabbit populations 106

Pest fish 108

Monitoring other pest species 109

How the community can help in managing pests 110

Previous photo: Applying Rotenone to Taylor Dam to eradicate rudd and tench.

Biosecurity Risks

Briefly ....

In Marlborough we are faced with ongoing control of many pest species that were the result of historic introductions, e.g. possums. Other pests, such as Didemnum vexillum in the waters of the Marlborough Sounds, are more recent arrivals. The Council has been managing a range of pest species for quite some time, but this has traditionally focussed on pests in primary producing sectors, especially farming. However, managing pests today has a much broader focus, with the protection of human health and of our indigenous terrestrial, marine and freshwater environments becoming increasingly important.

ISSUES

- Marlborough is vulnerable to the arrival of new pests.
- Pests can spread easily.
- The spread of pests can be made worse by growth and development pressures.
- Pests can impact significantly on indigenous biodiversity values and on the economy of Marlborough.

PRESENT AND FUTURE MANAGEMENT

The effects on the economy and environment of unwanted organisms entering New Zealand are potentially significant. Because of this, a lead role in dealing with biosecurity issues is taken by central government, particularly by the Ministry of Agriculture and Forestry. A significant role of the Ministry, through Biosecurity New Zealand, is in preventing unwanted pests and diseases coming into New Zealand. Controlling, managing or eradicating unwanted exotic species before they reach New Zealand, at the border, or after entering New Zealand is undertaken by Biosecurity New Zealand. The Council helps out Biosecurity New Zealand by providing a link with the wider community, especially in providing information e.g. how to minimise the risk of spreading didymo.

Regional Pest Management Strategy for Marlborough

The Council's main method of managing pests has been through developing and implementing a regional pest management strategy. The Council's current strategy classifies 33 plant and 4 animal species as pests, because they cause, or have the potential to cause significant adverse effects on Marlborough's economy and/or environment. Individual pests are placed into one of 3 categories:

- "Surveillance Pests" - monitored for their distribution, spread and impact over the life of the strategy.
- "Containment Control Pests" - already well established with the long-term aim being to prevent spread to new areas and reduce density where possible.
- "Total Control Pests" - limited distribution and density and the long-term aim is eradication.

For some total control plant pests, the Council works with the Department of Conservation on eradication work.

Monitoring rabbit populations

The most feral rabbit prone areas of Marlborough are the Upper Awatere Valley, the Clarence catchment, the Dashwood area and the coastal country between Blind River and Ward. Feral rabbits are classified as a containment control pest in the regional pest management strategy. Land occupiers are responsible for rabbit control on their own properties to keep the numbers to levels set out in the strategy.

The release of Rabbit Hemorrhagic Disease (RHD) in 1997, lead to a collapse in rabbit numbers throughout Marlborough. In many areas it continues to control rabbits, however, since 2002/2003, the Council's monitoring has shown an increase in rabbit numbers in a few sites in the Upper Awatere Valley. Numbers have been increasing above the maximum levels set out in the strategy for the first time since the introduction of RHD. Blood sampling of these rabbits has shown during this time immunity to

RHD has also increased, with some 50-60% of young rabbits shown to be immune to RHD. This has resulted in a rapid population expansion in the Upper Awatere Valley.

Ecological pests

The regional pest management strategy lists 18 plant and animal species as potential threats to ecological values in Marlborough. These species do not have a specific regime for control but are instead controlled on a 'site led' approach, targeted to sites with significant ecological value, where reducing pests would be effective in protecting those values. Vulnerable and important habitats like wetlands, coastal systems, forest fragments and waterways are often the type of sites where this approach to pest management is carried out.

Monitoring other pests

Through surveillance, monitoring and information from the public, the Council becomes aware of plant and animal species outside of the regional pest management strategy that may be a threat to Marlborough's economy or environment. Unwanted species such as didymo, didemnum, fish (tench and rudd) and the southern salt marsh mosquito, are all organisms that the Council has been involved in monitoring and/or actively working to get rid of over the past 5 to 10 years.

Education and how the community can assist in managing pests

The Council has produced 'fact sheets' for 24 of the pests included in the regional pest management strategy. These sheets are available on the Council's website and have information on how to identify the various pests and the most appropriate methods of control. The Biosecurity section of the Council can help in identifying unusual or invasive plants or insects on someone's property and provides information and advice on how to deal them. Early intervention is important when controlling new pests and can often determine the success or failure of future control programmes.

Over the past five years or so, the Council has been focussing on aquatic pests living in Marlborough's waterways. Controlling these pests costs tens of thousands of dollars each year. Together with the Department of Conservation, the Council has been promoting the message of "Stop the Spread" of unwanted aquatic organisms around Marlborough's waterways. This includes a pest fish and plant programme for schools, which to date the programme has been presented to 41 classes.

Rock scraping for Didymo surveillance

Displays on nuisance aquatic plants and fish have also been set up and staffed by the Council and Department of Conservation at the Garden Marlborough fete, boat shows and at A&P shows.

Biosecurity Risks

In depth ....

Biosecurity means the exclusion, eradication or effective management of risks posed by pests and diseases to the economy, environment and human health. The terms 'biosecurity' and 'pests' are used interchangeably in this report.

New Zealand's geographical isolation from the rest of the world has both positive and negative implications when looking at the potential risks from unwanted species crossing our borders. On the one hand, being an island some distance from other countries, means we are free of many serious pests and diseases that are present overseas. On the other hand, our small size and isolation means we tend to trade and travel much more than by people in other countries, thereby exposing us to a greater risk of unwanted organisms or pests entering New Zealand.

The kiore (pacific rat) and kuri (Maori Dog) are thought to be the first exotic species introduced to New Zealand by humans at the time of the arrival of the Maori some 700 years ago. The number of exotic species deliberately introduced increased rapidly during early European settlement of New Zealand as the settlers brought plants and animals with them that reminded them of home. Many species of pest plants started off as garden plants. Some species rapidly became pests because of favourable conditions or lack of predators and diseases. Today there are strict controls dealing with the introduction of new species, and so the greatest biosecurity risk comes from accidental introductions, smuggling of organisms or contaminated goods.

The introduction, deliberate or otherwise, of exotic species into New Zealand could harm our economy, human health, recreational values, cultural values and the wider environment. Some of these exotic species are well known with recognised impacts. However, others are not recognised as pests because they may lie apparently dormant for a period before spreading significantly. When their impact is discovered, it can often be too late to be able to successfully eradicate them.

In Marlborough we are currently faced with the ongoing control of many pest species that were the result of historic introductions. While the Council has been managing pest species for quite some time, this has traditionally had a focus on pests in primary producing sectors, especially farming, through organisations such as nassella tussock boards and pest destruction boards. However, managing pests now has a much broader focus with the protection of human health and of our indigenous terrestrial, marine and freshwater environments becoming increasingly important.

NATIONAL OVERVIEW

The threat of unwanted organisms entering New Zealand and the consequent effects on our economy and environment could be significant. Because of these threats, a lead role is taken by central government in dealing with biosecurity issues, particularly by the Ministry of Agriculture and Forestry, which has an overall governance role in biosecurity. A significant role of the Ministry, through Biosecurity New Zealand, is the overall management of the whole biosecurity system (commonly known as 'end to end' responsibility).

Biosecurity New Zealand's work is primarily governed by the Biosecurity Act 1993, which sets out five reasons why pests should be controlled and these are for: economic wellbeing; ecological values; soil and water quality; human health or enjoyment of recreational values; and Maori values. Biosecurity New Zealand is supported by other government agencies such as the Department of Health, the Department of Conservation and the Ministry of Fisheries.

Biosecurity New Zealand takes a lead role in preventing unwanted pests and diseases coming into New Zealand. This organisation Zealand controls, manages or eradicates unwanted exotic species pre border, border, and post border. The majority of post border activities are associated with incursion response regimes and pest management.

The kiore was one of the first pests introduced into New Zealand

A number of industry groups are also involved in managing pests that may be harmful to their interests. For example, there are three national pest management strategies: the Animal Health Board's strategy for bovine tuberculosis (Tb) and two National Beekeepers' Association strategies, for American foulbrood and for Varroa (bee mite). The Council has had until quite recently, a specific responsibility for providing services to the Animal Health Board, under the National Pest Management Strategy for Bovine Tuberculosis. This has meant managing and controlling feral animals such as possums and ferrets that carry Tb. (The Animal Health Board now carries out this work.)

Biosecurity New Zealand is involved in managing 11 organisms declared as 'national interest pests'. These are pests that could significantly harm New Zealand's economic, environmental or cultural values. One example is Cape tulip *Homeria collinais*, which is poisonous and has the potential to establish dense colonies over wide areas of pasture. It could therefore have a serious economic impact on New Zealand's agriculture industry if it were to become widely established. Biosecurity New Zealand is attempting to eradicate Cape tulip from New Zealand, including from areas in Admiralty Bay in the Marlborough Sounds.

The Council also helps Biosecurity New Zealand by providing a link with the wider community in response to pest incursions. For example, didymo (*Didymosphenia geminata*) is an unwanted organism at a national level. The Council's recent role, together with others, has been to monitor local rivers and put up signs along waterways informing the public about how to minimise the risk of spreading didymo. At the same time Biosecurity New Zealand has been active in researching this pest and implementing a nationwide publicity campaign - see box 'Didymo (*Didymosphenia geminata*)'.

Sampling for presence of microscopic Didymo cells

DIDYMO (*Didymosphenia geminata*)

Didymo, or rocksnot as it is commonly called, is an invasive algae that was first discovered in New Zealand in 2004. Didymo belongs to the group of single-celled aquatic plants (freshwater alga) known as diatoms. Although it is microscopic, didymo can form dense colonies called algal blooms, which produce large amounts of a mucus-like substance that attaches firmly to underwater surfaces. Didymo does not pose a threat to human health, but it is visually unappealing. Large didymo blooms can also reduce the suitability of habitats for freshwater fish, invertebrates and plant species, as it forms impenetrable mats over all surfaces, including other plants, logs and debris.

Since its establishment in Southland in late 2004, didymo has spread throughout many rivers in the South Island and while it has not spread as quickly as initially thought, it is now confirmed in at least 84 South Island rivers. It is suspected that didymo was first introduced into New Zealand waters, and subsequently spread into other waterways in the South Island, by recreational river users.

In March 2008 didymo was confirmed as being present in Marlborough, when several small colonies not much larger than a thumb nail, were found near Dip Flat (near the Rainbow Ski field turnoff) in the Wairau River. After the initial discovery of didymo in the Wairau River, a survey of the mainstem and tributaries upstream of Dip Flat, was carried out to determine how far it had spread. No didymo was found in the eight sites that were sampled upstream of Dip Flat. Didymo cells were found during microscopic analysis of a sample taken downstream at the Wash Bridge but no colonies were observed.

Biosecurity New Zealand is responsible for administering long term management plans for didymo and has placed a huge emphasis on public awareness and individual responsibility to minimise the spread of didymo. The publicity is based on trying to make sure people carry out a 'Check, Clean and Dry' process if moving between waterways. This involves:

CHECKING: before leaving the river, to make sure all obvious clumps of algae are removed as well as being careful about looking for hidden clumps. The clumps need to be left at the affected sites and be treated through the approved cleaning methods and then put in the nearest rubbish bin.

CLEANING: all items need to be soaked and scrubbed for at least one minute in either hot (60'C) water, a 2% solution of household bleach or a 5% solution of salt, nappy cleaner, antiseptic hand cleaner or dish washing detergent.

DRYING: if cleaning is not practical, once an item is completely dry it should not be used for another 48 hours before being used in another waterway.

To support Biosecurity New Zealand's message, over the last two years the Council, the Department of Conservation and the Nelson-Marlborough Fish and Game Council, have jointly been travelling throughout Marlborough talking to river users about didymo and promoting the 'Check, Clean, Dry' message. During the 2007/2008 summer over 6,500 people were talked to about the risk of didymo spreading. People were also spoken to on other occasions such as at camp grounds, backpackers and when advisory signs were posted at access points to rivers. People travelling to the North Island on ferries from Picton are also spoken to about the potential risk of spreading didymo to North Island rivers where it currently is not known to be present.

The Council and other agencies continue to carry out inspections of Marlborough rivers regularly.

Didymo affected waterways – from Biosecurity New Zealand website

BIOSECURITY RISKS FOR MARLBOROUGH

Marlborough is vulnerable to the arrival of new pests

As previously explained, New Zealand is generally vulnerable to the arrival of unwanted organisms from overseas, despite our physical isolation from the rest of the world. Unwanted organisms are most likely to enter New Zealand through passengers and trade goods in cargo on ships and aircraft but also through those craft themselves. For example, organisms can be introduced from visiting ships and yachts, either attached to hulls as fouling or in ballast water. Unwanted organisms can also arrive through animals or through the air.

Recreational and sporting people can also inadvertently introduce pests into New Zealand, especially into our waterways from equipment used elsewhere in the world. An example of this is didymo as reported in the box 'Didymo (*Didymosphenia geminata*)'.

Marlborough is also susceptible to new pests arriving from other regions around New Zealand in all the same ways as they do when first arriving in New Zealand. For example, didymo can be easily transported around New Zealand from region to region through boats, kayaks or fishing equipment. The Styela clava sea squirt, although only being found on one occasion in Marlborough's coastal waters, arrived on a yacht from another region where the pest was known to be present. Other pests can be easily spread by birds or other animals as well as on vehicles or mechanical equipment.

Council staff undertaking nassella tussock control

To some extent, the presence of Cook Strait does help provide a natural barrier in isolating Marlborough from some pest species that are present in the North Island. Despite this it is surprisingly easy for pests to be introduced into Marlborough by a number of ways.

Pests can spread easily

Many plant and animal pests can spread easily and quickly. Others don't spread so fast but are nonetheless vigorous. This is particularly so for plant pests, which often have seeds that remain viable in soil for many years. Such an example is nassella tussock, which was introduced to New Zealand from South America as a contaminant in lucerne seed. However, this tussock is largely unpalatable to stock. The seed is mainly wind dispersed, which has helped it to spread through Canterbury and Marlborough. Animals, machinery and hay also help in the spread of seed from this tussock.

Nassella was first recognised as a problem in the 1940s and by the 1950s some farmers were forced to abandon their properties as the tussock had completely taken over the pasture grasses making it uneconomic to farm stock.

Aquatic plant pests are also very easy to spread as the smallest of fragments can form a new infestation. The clear nature of Marlborough's waterways and high sunshine hours combine to provide ideal growing conditions for aquatic plants. Prolific growth of aquatic plant pests can impede water flows and block drains. Most pest species were originally introduced to New Zealand for the aquarium trade, but have become established in the wild when unwanted aquariums have been discarded into waterways. Many aquatic plants that have the potential to be pests, or that are currently pests, are banned from sale, propagation and distribution, although aquarium hobbyists are still known to value some species.

In the future, climate change may make Marlborough more susceptible to warmer climate pest species. This may have impacts in Marlborough's coastal areas and waterways.

Growth and development pressures

In some cases the ease with which pests can spread is made worse by the growth pressures currently being experienced in Marlborough. With the significant increase in the planting of grape vines, especially in the Awatere Valley and further south, there have been extensive land clearance activities undertaken

to make land ready for planting. Machinery involved in the clearing of land can potentially act as a host in spreading pest plants to other areas. Other vehicles, or even the movement of stock, can also act as hosts in transporting pests.

There has also been growth in the numbers of people living on small lifestyle blocks. This has both pluses and minuses in managing plant pests especially. There can be difficulties for the Council in having to contact a greater number of people to give advice on landowner responsibilities relating to pests. There can also be a lack of understanding by rural landowners about why they need to be vigilant in controlling plant pests and how their activities can worsen the spread of pests. On the other hand having more people in rural areas can assist in controlling pests as there are physically more people to do so.

Heavy vehicles involved in road construction and maintenance can contribute to the spread of plant pests. Gravel used in roading works is often left for periods of time during which plant pests can become established. When gravel is moved to another area, the plant pest may be inadvertently shifted to an area where it hadn't previously been. This could have significant consequences if it occurred in sensitive environments such as alpine areas or along coastal margins.

The box 'Chilean needle grass and nassella tussock' describes the impacts of land use change in south Marlborough in managing these two plant pest species.

Impact of pests on indigenous biodiversity values

The Council has undertaken an extensive programme over the past seven years to identify Marlborough's natural biodiversity under its 'Significant Natural Areas' programme. Through that process a number of sites with varying degrees of biodiversity value have been identified. The survey work undertaken has found there are threats to many of the sites identified from amongst other things, feral animals and weeds.

Feral animals can consume native vegetation and predate on native birds, lizards and insects. Pigs, deer, goats and possums are the main grazers. Mustelids (ferrets, stoats and weasels), rodents (rats and mice), cats and to some extent possums, are the main predators.

Large areas of native forest that are under Department of Conservation management, tend to provide a refuge for some species, making it difficult for the Department and surrounding landowners to carry out ongoing effective pest control. Some control is carried out on private properties mainly through hunting and trapping, although this is very variable. The Council has also been involved with programmes run by the Animal Health Board to reduce the incidence of bovine Tb in Marlborough

Boneseed control

(mainly from possums, ferrets and cats). This programme has had a significant effect in reducing possum density and, therefore, reducing the number of herds infected with bovine Tb and the browsing of indigenous vegetation.

Weeds can invade and displace native species, particularly in open habitats where light conditions often allow them to quickly out-compete less vigorous or large native species. The edges of forest and shrubland areas, regenerating hillsides, river beds and wetland and coastal sites, are also quite vulnerable to the impact of invasive weeds. Some weed species in Marlborough pose a serious threat to the survival of indigenous plant species

Old mans beard is a major problem in areas like the Marlborough Sounds and alongside rivers. It actively smothers vegetation and provides a challenge to control because it can seed and spread profusely. The seed also has a fairly long life in the ground. Wilding tree species (pinus radiata and contorta, sycamore etc), are also a serious threat in some parts of south Marlborough, and to the extensive areas of regenerating hill slopes of the Marlborough Sounds. They are capable of growing in a wide variety of situations and will out compete most native vegetation in a short period of time. While relatively easy to control in the early stages, they have the potential to rapidly proliferate and destroy the integrity of native vegetation.

While historically managing pests has had a focus on economic values there has been an increasing importance placed on managing pests to protect indigenous biodiversity.

Impact of pests on Marlborough's economy

Marlborough's economy is based on a variety of primary producing industries that include agriculture, horticulture, viticulture, aquaculture and forestry. All of these primary producing industries are vulnerable in some way to incursions or infestations by pests.

CHILEAN NEEDLE GRASS AND NASSELLA TUSSOCK

Until recent years Marlborough's major land use has been pastoral farming. With the most significant returns now being experienced in the viticultural sector, land use change on Marlborough's more arable land has been dramatic, particularly over the last five years. Another significant trend has been the subdivision of larger properties into smaller blocks or lifestyle blocks. More people are seeking the rural lifestyle, away from town or city life.

These trends have proven to be challenging in managing Marlborough's two most invasive weeds - Chilean needle grass and nassella tussock. Nassella tussock is unpalatable to stock and forms indigestible balls in the stomachs of stock. If forced to graze the tussock stock may lose weight and die because the plant has a high fibre content and low nutritive value. Chilean needle grass is also unpalatable to stock when seeding. Its sharp seeds burrow into the skin of stock causing severe irritation and wounds to the animals and damage to pelts. The seed tail has a corkscrew effect as it burrows into its host so is difficult to remove.

As larger properties have been subdivided, new owners of the smaller blocks have to be educated in the control and management of these two invasive weeds. The Council has had to put in more effort to make sure that the new landowners know what their responsibilities are under the Regional Pest Management Strategy for Marlborough to control these invasive weeds. More inspections have also been needed to ensure landowners are complying with their control programmes. There are significant costs for land owners in having to control Chilean needle grass and nassella tussock every year.

A ball of Chilean needle grass seed taken from a four wheel motorbike on a property in Blind River, 17 November 2005

Chilean needlegrass seeds on four wheel motorbike.

Flowering nassella tussock near Ward - December 2006

As pastoral land has been developed for viticulture, issues have arisen in the Blind River area with earthmoving machinery coming off properties that have extensive infestations of Chilean needle grass. The Council has been requiring earthmoving machinery to be washed, so that soil potentially contaminated with seed from this weed is removed before the machinery is taken to clear areas. Most landowners in the Blind River area with infestations of Chilean needle grass have been very co-operative in trying to avoid the further spread of this pest weed, as have the earthmoving contractors.

A total of 591 properties in Marlborough are now known to have an infestation of nassella tussock, while 125 properties have a known infestation of Chilean needle grass. With control work having been carried out for many years, infestations of these pest species are now at levels that no longer cause any major reduction in agricultural production. However, continued vigilance and intensive control work is still necessary to ensure existing infestations do not increase in size or density and infestations of these pests do not occur in new areas.

Current control of pests such as rabbits and nassella tussock has continued on from the work of the nassella tussock boards and pest destruction boards of the 1960s, 70s and 80s. Many of these species that were targeted forty years ago are still identified as pests today, as they are widespread and trying to completely eradicate them is not considered possible.

Within the Marlborough Sounds, the aquaculture industry is under threat from a relatively new pest: *Didemnum vexillum*, commonly known as the Whangamata sea squirt. It is a threat to the marine farming industry because of its ability to smother mussel farm lines. Didemnum has been found on marine farms in Queen Charlotte and Pelorus Sounds. There are no formal control mechanisms for this pest and this highlights a general lack of expertise and resourcing in dealing with marine biosecurity issues. More on what we know about the spread of Didemnum vexillum and what the responses have been in trying to manage this pest is described in the box 'Sea squirt - *Didemnum vexillum*'.

There is also potential for the viticulture industry to be subject to infestations from pests, mostly from micro organisms such as botrytis or other viruses that could affect plant development. Some vineyard owners have had issues with predation by birds of grapes. There is also the potential for incursions from overseas pests such as the glassy-winged sharpshooter, which can spread bacteria causing potentially damaging diseases to grapevines, as has occurred in south California.

While there has been a long history of pest management in Marlborough in traditional farming sectors, pest management has not been so apparent for other activities. Pests could also have an impact on the tourism industry: for example the spread of didymo into Marlborough's' waterways could see a reduction in recreational opportunities; and the presence of wilding pines in the Marlborough Sounds degrades this iconic landscape.

One of the strengths of Marlborough's economy is that it is diverse. This means that if one of the primary producing activities is under threat, there are other activities, (including other primary production, tourism, aircraft engineering) that will still keep the economy going. It is important however, that the Council, industry groups and the wider community remain alert to the potential for pests to affect the economic sustainability of Marlborough.

RESPONDING TO BIOSECURITY RISKS

The Biosecurity Act 1993 gives power to regional councils to take a significant role in carrying out pest management activities. Given the range of pests present in Marlborough, and the potentially damaging consequences to our economy and to the wider environment, the Council has chosen to be actively involved in managing pests. The Council's main method of managing pests has been through developing and implementing a regional pest management strategy. A regional pest management strategy is prepared under the Biosecurity Act and includes pests that have a regional, rather than national significance. Strategies can contain a variety of methods (including rules) about how listed pests are to be managed.

The Council is involved in pest management to varying degrees depending on the extent, spread and costs of management for the various pests. The following methods are currently used by the Council.

Monitoring and surveillance is probably the most important method used. Without being aware of what pests exist in Marlborough, the extent to which they are present, and also being on the lookout for potential new pests, the Council's responsibilities for pest management would be very hard to meet.

Marine farming is an important contributor to Marlborough's economy

SEA SQUIRT - *Didemnum vexillum*

Didemnum vexillum is a colonial Ascidian or type of sea squirt that has a leathery or spongy textured appearance and is distinctive with its mustard or orange/yellow colour. The sea squirt quickly builds large populations and can spread naturally through sexual reproduction by releasing larvae that are transported in water currents. It can also reproduce through fragments breaking off and growing new colonies.

Artificial structures such as wharf piles, jetties, mooring lines, boat hulls and marine farms are easily colonised by Didemnum vexillum. It has the ability to quickly smother these structures and can form tendrils of up to two metres long. There is much concern within the aquaculture industry that if the Didemnum sea squirt is allowed to spread and accumulate, this will have an effect on mussel farm production by reducing the ability of mussels to grow. There is also a risk that Didemnum could accumulate sufficiently and spread across marine sediments and rocky areas and have a significant impact on our natural ecosystems. However, there is no evidence to date to suggest this has happened in the Sounds, although overseas experience suggests this could occur.

The presence of Didemnum vexillum was first discovered in New Zealand in 2001 in Whangamata on the Coromandel Peninsula. Didemnum was first noticed in the Marlborough Sounds in late 2001-early 2002 on the hull of a large logging barge, which was moored in Shakespeare Bay near Picton.

Despite initial attempts to remove Didemnum from the barge it spread onto Waimahara Wharf in Shakespeare Bay. Attempts to clean the wharf were largely successful although a few residual colonies remained and these spread to other structures in the bay. Other parts of the Queen Charlotte Sound also became infected, particularly marine and salmon farms in East Bay, Arapawa Island. In 2008 the total known extent of Didemnum vexillum in the area around the top of the South Island was approximately 275 hectares.

Because of the potential for this species to significantly affect the aquaculture industry, a Didemnum Working Group was established in April 2006. This was despite Didemnum vexillum not being deemed an unwanted organism at a national level or being identified as a pest in the Regional Pest Management Strategy for Marlborough. With funding from the aquaculture industry, the Council and Biosecurity New Zealand, this group carried out a comprehensive eradication and control programme on a voluntary basis throughout 2006 and 2007. (This group was later recognised for its efforts in trying to manage this spread of this pest through the Marlborough Environment Awards programme. The working group received the 'Supreme' and 'Habitat Enhancement' awards.)

Didemnum vexillum

The voluntary control programme built on lessons initially learned in treating Waimahara Wharf. This included wrapping infected structures to smother the organism. A comprehensive educational campaign and industry codes of practice were also undertaken to reduce the risk of spreading Didemnum further. For a time it was a common sight to see moored boats and jetties around the Sounds wrapped in plastic.

Initially, it seemed that this control programme was having a degree of success, and in several sites Didemnum was eradicated. However, in late 2007 it became evident that it had spread into Pelorus Sound, with numerous small infestations being reported on marine farms throughout the inner Pelorus and Kenepuru Sounds. It was also discovered that Didemnum was

DISTRIBUTION OF DIDEMNUM VEXILLUM (MAY 2008)

well entrenched in Nelson Harbour, so it was conceded in June of 2008 that it was no longer economically feasible to continue with a coordinated control programme. While the aquaculture industry has decided to continue managing infestations on an individual site basis, there is still an ongoing concern as to whether this organism will cause significant harm to the industry as well as to the wider natural environment.

Didemnum Working Group Marlborough Environment Award for wrapping technique

Plastic wrapping of wharf structure

Information, education and advice are given to land occupiers, as well as to the wider community, on the best way to control pests. This is done through rural shows, garden fetes, etc. Fact sheets have also been prepared on a wide variety of pests. The Council puts in significant effort to provide information, education and advice.

Rules in the Regional Pest Management Strategy for Marlborough require land occupiers to carry out work to remove some plant and animal pests. The Council helps by preparing programmes that map out target dates for land occupiers to complete the work by. The resource management plans also have rules to control when chemicals and other hazardous materials are to be used in managing pests.

Direct control of a small number of pests is carried out by the Council. In some cases this is undertaken in partnership with the Department of Conservation. Direct control is generally for pests low in numbers and at known sites. The eventual aim is to eradicate them from Marlborough.

Species led control of pests places the focus on getting rid of or controlling a specific pest. This has historically been the way most pest management has been carried out in Marlborough. Species led control aims to eradicate pests where they are limited in number or distribution and to manage spread where pests are more widespread.

Site led control looks at protecting the natural values of specific areas. This approach is preferred in vulnerable and important habitats like wetlands, coastal systems, bluffs, forest fragments and waterways. All pests within these type of areas are targeted for control.

Biological controls introduce and establish colonies of natural enemies that prey on, or adversely affect, a pest. This control seeks to restore the natural balance between a pest and its environment. Biological control is used on some plant pests in Marlborough.

Regional Pest Management Strategy for Marlborough

Currently the Regional Pest Management Strategy for Marlborough classifies 33 plant and 4 animal species as pests, because they cause or have the potential to cause significant adverse effects on Marlborough's economy and/or environment. Individual pests are placed in one of three categories:

"Surveillance Pests" are pests where the Council will monitor distribution, spread and impacts over the life of the strategy. For example, Darwin Ants are monitored because this species is an invasive ant from Australia, which can multiply quickly and has a huge appetite. They are a serious indoor problem and will predate on native ants, insects and earthworms and can also kill baby birds in their nests. (In addition to the specified surveillance pests, the Council also undertakes monitoring or surveillance work throughout Marlborough on many plant and animal pests, which are outside the strategy.)

"Containment Control Pests" are pests that are well established in Marlborough. The long-term aim for these pests is to prevent their spread to new areas and to reduce the density of the pest where possible. The possum is an example of a containment control pest as it causes significant environmental damage by defoliating forests and predating on native insects and birds. Offshore islands in the Marlborough Sounds are currently free of possums and the objective is to keep this pest free status.

"Total Control Pests" are pests of limited distribution and density in Marlborough and the long-term aim is to eradicate them. An example of such a pest is parrots feather, which was introduced to New Zealand as an ornamental aquarium and small garden pond plant. Parrots feather forms tangled mats that can emerge 15 centimetres above the water. It spreads easily and can impede drainage causing flooding as well as displacing native vegetation.

The management regime for each pest applies to all, or a specified part of, the land within Marlborough. In most cases, the land occupier is responsible for controlling pests. The exception is for pests classified as 'Total Control' where either the Council and/or the Department of Conservation usually carry out the control work.

The Council organises pest control programmes, ensures land occupiers carry out control works, carries out surveillance to see if there are new infestations of pests and provides information and advice to land occupiers on the best ways to control each pest.

The strategy also lists 18 plant and animal species that are potential threats to ecological values in Marlborough. These species do not have a specific regime for control because they do not pass the required cost benefit tests set out in the Biosecurity Act. However, control of these pests will likely be based on a 'site led' approach, targeted to sites with significant ecological value where the reduction of a range of pests would be effective in protecting those values. An example of a site led approach is described in the box 'Tui Nature Reserve (Pelorus Sound)'.

TUI NATURE RESERVE (PELORUS SOUND)

Since settling in the outer Pelorus Sounds close to 15 years ago, the Plaisier family has steadily improved conservation values on its 42 hectares of forested land. This has included permanently protecting the majority of the property with a covenant under the Queen Elizabeth II National Trust.

Ellen, Brian and their children Leona and Liam, have reduced animal pest numbers through a long term trapping programme, recently boosted by assistance from the Council's Landowner Assistance Programme. They are working towards recreating a healthy ecosystem of native plants and animals that would have been present before humans arrived in the Sounds. Weka numbers are well up and the kohekohe forest is making a comeback now that possum, rat and stoat numbers are very low.

The assistance from the Council programme has helped fund the purchase of 50 Timms kill traps, which the Plaisiers have installed along traplines on more remote parts of the property. This complements more intensive trapping on accessible areas. The Timms traps are cleared and re-baited about every two weeks and records are kept on possums numbers caught. Over the first six months approximately eight possums have been killed per month with the Timms trapline.

The Plaisiers have established low impact tourist accommodation on the property and share their knowledge and enthusiasm with visitors.

Leona and Liam checking traps

What is known about 'Total Control' pest plants

There are two categories of total control pest in the strategy: the first is where the cost of control is shared between the Council (75%) and the land occupier (25%) - this is referred to as a 'Marlborough District Council Initiative'; the second is where the cost of control is shared between the Council and the Department of Conservation - this is referred to as a 'Marlborough District Council and Department of Conservation Joint Initiative'.

The joint initiative with the Department of Conservation has tended to focus on pests with potential to invade large areas of Marlborough's indigenous forests, coastal shrublands and waterways. The species in this control regime are boneseed, climbing spindleberry, eel grass, Madeira vine, spartina grass, moth plant, cathedral bells, evergreen buckthorn and Senegal tea.

For the Council initiative, the species are African feather grass, Bathurst bur, bur daisy, saffron thistle, giant needlegrass, Chinese pennisetum and parrot's feather. Most of these species have the potential to severely affect pastoral farming and cereal harvesting. Others, such as African feather grass, also pose a threat to Marlborough's conservation values.

Total control pests are managed by what is referred to as a 'direct control' method. The reason for this method is that these pests are of limited distribution and density and eradicating them is seen as a feasible option. The Council is aware of the location of many of these pests through its monitoring and surveillance activities. Control work is generally carried out by the Council (and its contractors) and in some cases by the Department of Conservation. Landowners also carry out control work on some species.

The aim with these plants is to destroy them at known sites on an annual basis before they produce seed, and also to prevent them from becoming established in new areas. Despite this work and ongoing monitoring, new sites of the total controls plant pests do continue to be discovered. These sites are recorded and then become subject to control programmes. Records of the numbers of total control plant pests destroyed each year are kept so that the Council can determine whether the objectives of the strategy are being achieved.

Monitoring information on the numbers of sites with infestations and plants destroyed is shown in Tables 5.1 and 5.2. These tables show data for the numbers of plants destroyed from 1999/2000 through until 2007/2008. Some pest species do not have data for earlier years and this is because they were not initially identified as a total control pest. For example, cathedral bells, evergreen buckthorn and Chinese pennisetum were only included as total control pests in the latest review of the strategy.

A little more detail is provided on several of the total control plant pests and how effective the control programmes have been in identifying and controlling sites with these infestations.

Parrots feather control

African feather grass

African feather grass

African feather grass is a robust, perennial grass with spreading rhizomes that form dense tussocks. It was introduced to New Zealand as a soil binder and was later promoted as an ornamental plant because of its long flower heads. Its prolific seeding and vigorous creeping root system will result in dense clumps growing up to 2 metres tall, which resemble clumps of pampas grass.

African feather grass produces large amounts of seed that germinates readily in the field. Seeds have bristles and will cling to clothing and to the wool and hair of animals. This plant species is also generally unpalatable to stock. Rhizomes can be spread by cultivation equipment, road graders or other similar machinery to form new infestations. Some spread has been attributed to human interest in the plant for dried flower arrangements and for ornamental purposes in gardens.

TABLE 5.1: TOTAL CONTROL PLANT PESTS 'CORE DATA' (MARLBOROUGH DISTRICT COUNCIL INITIATIVE)

Total Control Plant Pest	Number of Known Infestations	Plants Destroyed											
		1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Bur Daisy	1	23,500 approx	2,150 approx	31,000	20,500 approx	6,000 approx	500	130	55	110	50	32	52
African feather grass	16	365	167	162 - Included 1 new site	131	96	106	79	119 - Included 2 new sites	158	35 - Included 1 new site	210 - Included 1 new site	1,965
Saffron Thistle	16	147	26	2,000 approx	77 - Included 1 new site	6,035 - Included 6 new sites	4,823	116	1,325	1,049	341	219 - Included 1 new site	1,084
Bathurst Bur	12	-	-	69	669	301	294	12	119	81 - Included 1 new site	159	2	12
Giant Needlegrass	12	-	-	-	-	3,000 approx	273	325	451	329	225	327	34
Chinese Pennisetum	11												84
Parrots Feather*	17								5 new sites	4 new sites	2 new sites	1 new site	4.3 litres - 5 new sites

** Figure shown is litres of Glyphosate Herbicide concentrate used for parrots feather control in Gibsons Creek. Infestations are still too extensive in this waterway to count individual plants.*

TABLE 5.2: TOTAL CONTROL PLANT PESTS 'CORE DATA'– (MARLBOROUGH DISTRICT COUNCIL/DEPARTMENT OF CONSERVATION COMBINED INITIATIVE)

Total Control Plant Pest	Number of Known Infestations	Plants Destroyed								
		1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Boneseed	17	-	-	16,500 approx. - Included 3 new sites	18,904 - Included 5 new sites	19,843 - Included 5 new sites	22,421 - Included 1 new site	19,011	11,300	6,455
Climbing Spindleberry	5	2,580 approx.	2,530 approx.	1,020 approx.	279	79	85	139 - Included 1 new site	133	333 - Included 1 new site
Moth Plant	93	-	-	25	139 - Included 3 new sites	135 - Included 5 new sites	127 - Included 7 new sites	86 - Included 1 new site	603 - Included 58 new sites	677 - Included 9 new sites
Madeira Vine	3	500	250	450 - Included 1 new site	23	63	7	14	20	5
Eel Grass	9	-	21 tonne	3 tonne - Included 1 new site	2.75 tonne - Included 1 new site at Waterlea Creek	1.25 tonne - Opawa Loop 60 plants - Waterlea Creek	60 kilograms - Opawa Loop	100 kgs - Opawa Loop	1,500 kgs - Included 2 new sites	150 kgs - Opawa Loop 40 kgs - Waterlea Creek
Cathedral Bells	7	-	-	-	-	-	-	-	-	364 - Control work was carried out at 4 of the 7 sites
Evergreen Buckthorn	3	-	-	-	-	-	-	-	-	1,613
Senegal Tea	2	-	-	-	-	47 - 2 new sites	1	9	-	Both known sites have been eradicated
Spartina Grass*	5					580 litres	415 litres	19.7 litres	1.97 litres	1.25 litres

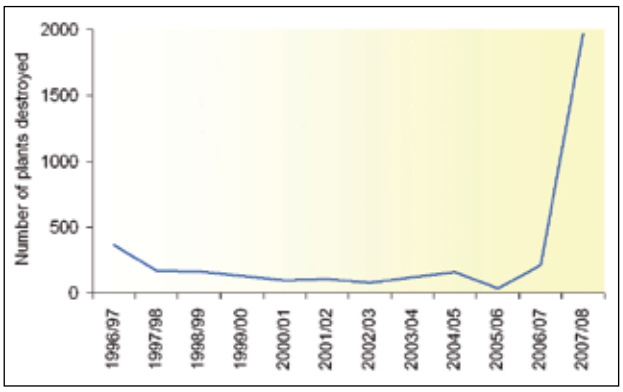
**Figure shown is litres of Gallant Herbicide concentrate used for spartina grass control each spraying season. Infestations are still to extensive to count individual plants.*

Infestations of African feather grass are scattered throughout the North Island and east of the main divide in the South Island, from Marlborough to Central Otago. There are 16 known sites of African feather grass in Marlborough. Figure 5.1 shows the number of African feather grass plants that have been destroyed by the Council since 1996/1997 through until 2007/2008.

A new site of African feather grass at Ngakuta Bay resulted in the dramatic increase of plants destroyed during the 2007/2008 season. An area in the bay, which had always been kept mowed, was allowed to grow and the result was the growth of 2,000 African feather grass seedlings. Once these plants were discovered they were sprayed with Glyphosate.

Plant numbers destroyed at the other known sites continue to decline.

FIGURE 5.1: NUMBER OF AFRICAN FEATHER GRASS PLANTS DESTROYED



Eel grass

Eel grass is a submerged aquatic perennial plant, which is rooted in muddy and sandy beds of streams, ditches, lakes and ponds, forming dense beds of vegetation. It produces clusters of long ribbon-like leaves with fibrous roots (up to 40 centimetres long) at nodes, along horizontal roots, growing on or below the stream bed. Eel grass grows in both still and flowing water up to a depth of 9 metres. Dense stands are formed with leaves covering the water surface, out competing and displacing native species. Eel grass can also block drains and impede water flows.

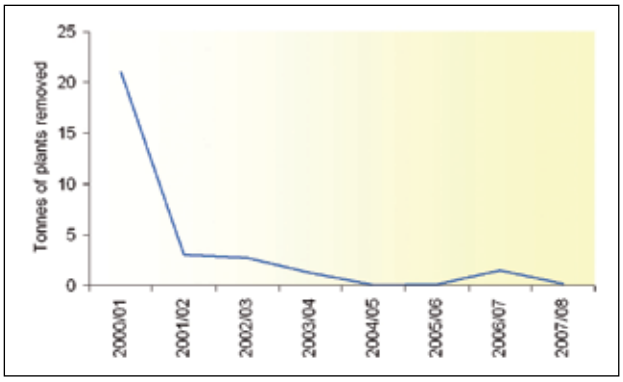
Eel grass spreads entirely by vegetative means as it does not produce viable seed in New Zealand. This species has been a popular aquarium plant and its spread into the wild has occurred through people discarding unwanted aquariums into rivers and streams.

Eel grass being removed by hand from the Opawa River Loop

In Marlborough, there are eight sites in the Opawa River Loop and one in Waterlea Creek in Blenheim that are infested with eel grass. In 2000/2001 a total of 21 tonnes of eel grass was removed from these 2 waterways. This has now reduced significantly, with only about 150 kilograms being removed over the past year from the Opawa Loop and 40 kilograms from Waterlea Creek - see Figure 5.2. Generally eel grass is removed by being pulled out by hand and is therefore quite labour intensive.

During monitoring of known sites in 2007/2008, infestations of eel grass were found at only three of the nine known sites. Over the last few years several sites have been controlled using carpet as a weed mat. This has proven to be a very promising method of control.

FIGURE 5.2: AMOUNT OF EEL GRASS REMOVED FROM MARLBOROUGH'S WATERWAYS



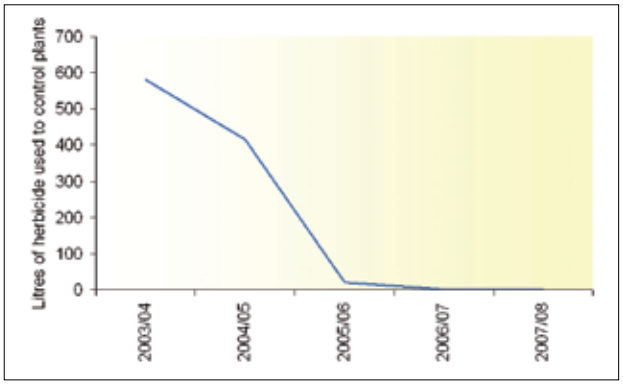
Spartina

Spartina grass is a sward-forming grass that originates from the United Kingdom. It grows from underground rhizomes, which will break off and establish elsewhere but can also spread by seed. Spartina grows in estuaries and displaces native plants and animals of salt marshes and mud flats and can cause accelerated sedimentation in estuaries and impede river water flows. It was deliberately introduced into New Zealand in the early 1900s and introduced to the Havelock Estuary in 1952. The belief was that tidal areas would be converted into 'productive land' and navigational channels would be protected.

In 1991, a survey showed that spartina had spread into the Pelorus Sound and the inner Queen Charlotte Sound. In response, the Department of Conservation began carrying out the control of spartina in areas outside of the Havelock Estuary. Control work has been carried out on an annual basis since 1994 and has proven to be very successful.

Spartina was included in the 2001 Regional Pest Management Strategy for Marlborough. Although categorised as a 'surveillance' pest, which effectively meant that the spread of the plant would be monitored for its distribution, density and impacts, an active control programme was set up to try and stop its spread further into the Sounds. This was because during flood events the grass was breaking off and being carried further down Pelorus Sound and then re-establishing with ease.

FIGURE 5.3: LITRES OF GALLANT HERBICIDE USED TO CONTROL SPARTINA



A control programme for Havelock Estuary involving the use of the herbicide Gallant was undertaken by the Department of Conservation and the Council in November 2003. Subsequent control work took place in December 2003 and January 2004. Aerial application by helicopter was used to control the dense infestations. The hand spraying and aerial spraying has been very successful, with only a few small areas being missed. The exact areas of spartina controlled each year can be determined from the amount of spray used to control the infestations. Since 2004 there has been a rapid decline in the amount of Gallant concentrate used to spray the known infestations of spartina. (All control work using herbicides has been authorised by resource consent.)

Spartina in Mahikipawa Arm pre control

Spartina in Mahikipawa Arm post control

Spraying Spartina

Boneseed

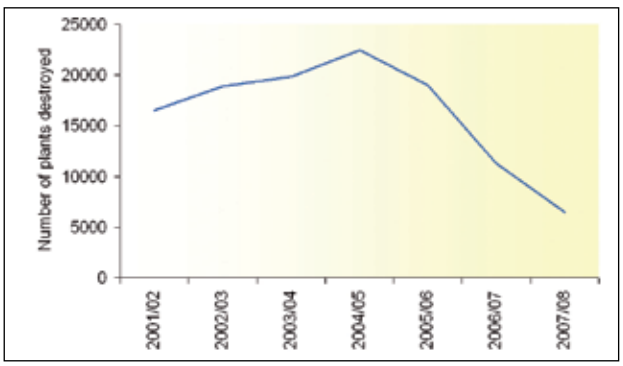
Boneseed is a bushy, multiple-branched shrub that grows up to 3 metres tall, with bright yellow flowers. It is a fast-growing plant that can quickly transform open landscapes into an impenetrable shrubland, impeding human access and excluding native vegetation. Boneseed is also a particular threat in coastal areas and is also known as saltbush, bitou bush or Higgin's curse. Birds disperse seeds after eating the fruit of the boneseed plant but humans also spread it by planting it.

This pest, which originates from the Cape region of South Africa, has been discovered in Marlborough at a number of sites in Queen Charlotte Sound, in Port Underwood, Kenepuru Sound and at Lake Timara just west of Blenheim.

Flowering boneseed

During the first year of this plant pest being within a control programme, about 16,000 plants were discovered and destroyed. During flowering each year, staff return to destroy any seedlings in the same areas before they get a chance to seed and germinate. The numbers of plants discovered rose in subsequent years rising to a high in 2004/2005 when about 22,500 plants were destroyed. Plant numbers destroyed since then have dropped dramatically as all the mature plants have been found and destroyed. It is the emerging seedlings that are currently being controlled and these are being pulled by hand.

FIGURE 5.4: NUMBER OF BONESEED PLANTS DESTROYED



Monitoring rabbit populations

The feral rabbit originates from Europe and was released in New Zealand in the late 1700s and 1800s as a food source. Rabbits quickly adapted to New Zealand's conditions and have thrived in the dry conditions and light soils of Marlborough's high country environment. High feral rabbit population levels affect soil and water quality, have a detrimental impact on economic production and increase the risk of soil erosion.

Pest destruction boards were set up in 1947 to control rabbits on rabbit-prone properties in Marlborough, at times employing up to 34 full time staff. The most feral rabbit prone areas of Marlborough are the Upper Awatere Valley, the Clarence catchment, the Dashwood area and the coastal country between Blind River and Ward. These areas all have a history of feral rabbit problems. Other areas, which have experienced a feral rabbit problem, include the Upper Waihopai Valley and the Upper Wairau Valley. Throughout these areas a cyclical poisoning programme has been the only method available to maintain low rabbit numbers.

Feral rabbits are classified in the Regional Pest Management Strategy as a containment control pest. Land occupiers are responsible for rabbit control on their own properties, and the Council monitors rabbit populations and ensures occupiers carry out control work to meet the objectives of the strategy, which uses the Modified McLean Scale to determine appropriate levels of rabbit population:

- The "Upper Awatere and Clarence" has been determined as level four on the Modified McLean Scale. Level four is defined as 'sign of rabbits frequent with some faecal heaps more than 5 metres apart, but less than 10 metres apart. Groups of rabbits may be seen'.
- The "Remainder of area within the Marlborough District" has been identified as level three on the Modified McLean Scale. Level three is defined as 'sign infrequent with faecal heaps more than 10 metres apart. The occasional rabbit may be seen'.

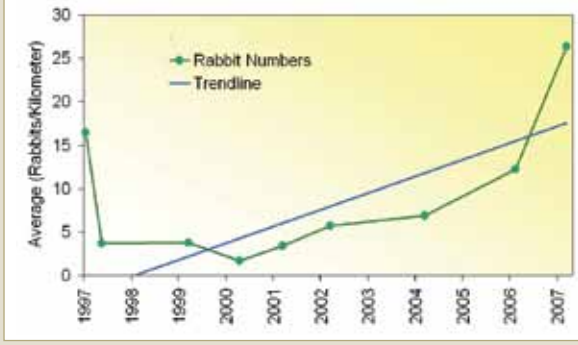
The release of Rabbit Hemorrhagic Disease (RHD) in 1997 lead to a collapse in rabbit numbers throughout Marlborough and in many areas continues to control rabbits. However, since 2002/2003, night counts have shown that rabbit numbers in a few sites in the Upper Awatere Valley have been trending upwards - see box 'Rabbit trends in Upper Awatere Valley and coastal sites'. Pockets of rabbits have been increasing to above the maximum

RABBIT TRENDS IN UPPER AWATERE VALLEY AND COASTAL SITES

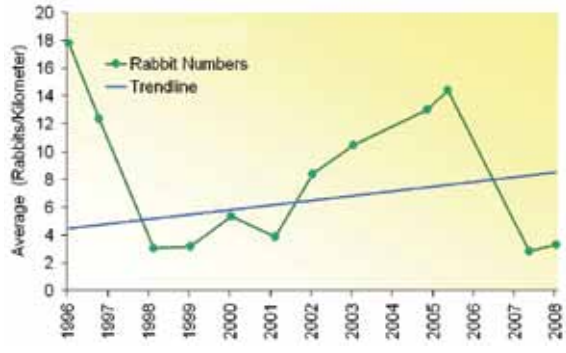
The Muller 'Top Block's and Middlehurst 'Tone' are typical of what rabbit numbers have been like in the high country of Marlborough. In 1996/1997 rabbit numbers were high but the illegal introduction of the RHD virus in 1997 saw numbers crash. For the following 4 to 6 years annual epidemics of RHD ensured population densities were kept low. But then over time as more rabbits became immune to the virus, numbers started to show an increase, ultimately exceeding the maximum allowable level in the Regional Pest Management Strategy. When rabbit numbers get above the maximum allowable level, a control programme is issued, and land owners need to carry out conventional control. The significant decline in March 2008 on the Middlehurst count reflects such a control programme.

The Vernon/Dashwood night count is the only coastal night count route and has a significantly different trend to the high country counts. Again numbers were high pre-RHD but dropped markedly after its release. However, since this time numbers have remained relatively stable with some annual fluctuation. In lowland Marlborough, RHD appears to have several epidemics that sweep through the population at different times. Sampling has shown that immunity levels have not reached those recorded in the high country. To date RHD has been effective at maintaining low rabbit populations in coastal Marlborough.

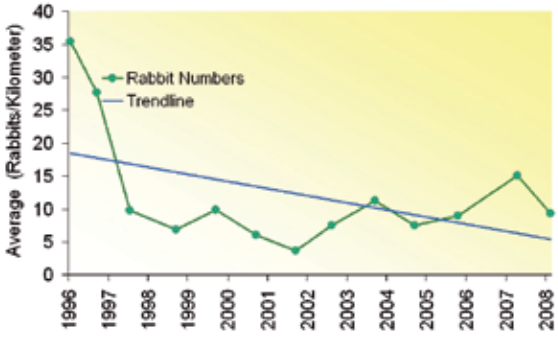
MULLER



MIDDLEHURST



VERNAN



allowable levels set out in the strategy for the first time since the introduction of RHD. Blood sampling of these rabbits has shown that during this time immunity to RHD has also increased. Of concern is the percentage increase of young rabbits shown to be immune to RHD, some 50-60%. This has resulted in a rapid population expansion. Since 2005 the number of sites where RHD was failing to control rabbits has increased significantly.

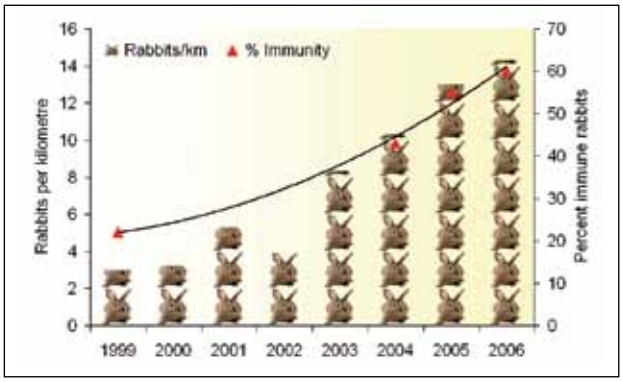
As RHD has been failing to control rabbit numbers the Council has required a number of landowners to carry out control programmes in large areas of the Awatere Valley. In 2006, 4 control programmes were issued covering a total of 6,200 hectares, with work to be carried out in the following winter. In 2007, 6 control programmes were issued for a land area of 7,000 hectares, for control work to be carried out in the winter of 2008. For the work carried out in the winter of 2007 aerial applications of pindone or 1080 pellet baits were used. Good results have been achieved in most cases with kill rates of 90 to 95%.

Council staff monitoring RHD immunity

The failure of RHD to control rabbits is a significant cause of concern to south Marlborough farmers. Because of this the Council is currently working with landowners, other South Island regional councils, and Landcare Research to see if RHD will 're-set' following control through poisoning. Blood samples from rabbits have been taken before poisoning to test for immunity to RHD. Blood samples have also been taken a year after poisoning to see if the number of immune rabbits has decreased following the poisoning operation. Early results do not clearly indicate whether rabbits are showing signs of immunity, so more sampling will be carried out.

It is very common for rabbits that survive RHD to have no ears. This occurs when a rabbit gets sick with RHD and the blood flow to the ears stops and the ears die. The rabbit then recovers, becoming immune to RHD, and has no ears.

FIGURE 5.5: INCREASING LEVELS OF RABBITS AND IMMUNITY TO RHD



Pest fish

In early 2002 a local eel fisherman discovered some unusual looking fish in his net in the Taylor Dam. The fish were rudd and tench, neither of which had previously been found in Marlborough. Tench and rudd are prolific breeders and can quickly build up large numbers. Both species were illegally introduced into New Zealand to start a recreational or 'sport' fishery and are well established in the North Island. They eat aquatic invertebrates, out competing and predating on native fish species as well as reducing plant growth. Their discovery was concerning, as once these pest fish are established in a waterway, it is virtually impossible to remove them as they are able to spread through a whole river catchment.

In order to stop tench and rudd spreading downstream of the Taylor Dam, the main body of the Dam was isolated from the Taylor River with a screened culvert. The Department of Conservation and the Council then undertook an intensive netting programme. This programme caught over 50 fish between 2002 and 2005. In autumn 2005, the Department of Conservation applied the fish poison called Rotenone to the Taylor Dam, in an attempt to eradicate these two pest fish species.

Follow up monitoring operations after the application of Rotenone did not catch any pest fish until January 2007 when adult tench were rediscovered. It is not known if the tench were descended from the original population or whether they were a deliberate re-release into the dam. Because of the discovery of more tench, a further application of Rotenone was applied to the Taylor Dam in May 2007.

Application of Rotenone to Taylor Dam

The Council has not found any pest fish species in other waterways in Marlborough except for goldfish. While goldfish are acceptable when contained in garden ponds and aquariums, they should not be released into stock ponds and other waterbodies, because they can establish large populations and become obese and eat the food that native species rely on.

Monitoring other pest species

From time to time the Council may get involved with incursions of pests that are not covered by the Regional Pest Management Strategy. Two of these have already been described earlier in this chapter - Didymo and Didemnum. A third pest not included in the strategy but which has been reported in previous state of the environment reports, is the southern salt marsh mosquito.

In the State of the Environment Report Update 2003/2004, the discovery of the southern salt marsh mosquito in the Wairau Lagoons was reported. Duck shooters in the Wairau Lagoon area had told of being bitten by aggressive mosquitoes on the opening day of the duck-shooting season. In response, the Ministry of Health undertook an investigation to see whether the mosquitoes were widespread.

The Ministry's survey initially extended from the Flaxbourne River to Port Underwood and areas in Queen Charlotte Sound and Havelock Estuary. Positive larval and adult stages of the mosquito were identified in the Wairau Lagoons area, with isolated infestations occurring on the coastal strip between the Wairau Bar and the Wairau Diversion and at an outlying site at Lake Grassmere.

FIGURE 5.6: LARVAL MOSQUITO SAMPLING 2008

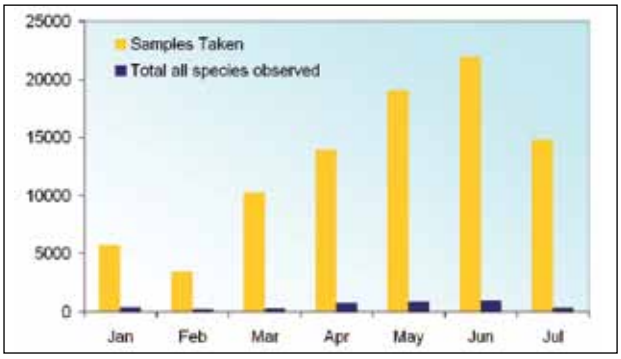
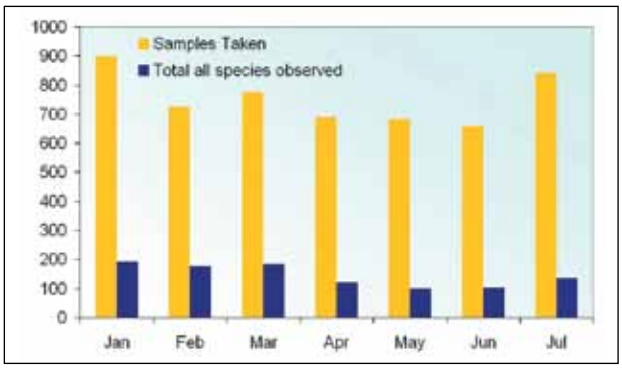


FIGURE 5.7: ADULT MOSQUITO SURVEILLANCE 2008



Southern Saltmarsh Mosquito

The health concerns with the mosquito, is that is an aggressive, daytime biter and in Australia is known to spread disease, notably the Ross River Virus. This can be transmitted from the mosquito to both animals and humans, although there continues to be no evidence to date of this happening in New Zealand.

An eradication and surveillance programme, initially under the management of the Ministry of Health and latterly under Biosecurity New Zealand, has been undertaken over the last four years. The eradication programme has involved both ground and aerial treatment. Ground treatment kills the larvae while aerial treatment interrupts the life cycle of the larvae. With these methods the eradication efforts have been successful in reducing the area needing to be targeted to a few hundred acres around the lower Wairau Plain. Recent adult trapping and larval sampling surveillance indicates that the mosquito and larval stages have been eliminated from all other areas in Marlborough.

Larval sample 'dipping'

Larval sampling is carried out literally by "dipping" into an area, such as an estuarine habitat, and having the samples analysed to see if any larvae were present. During the period 1 January to 31 June 2008, some 91,026 "dips" were made, of which 3,678 had various species of mosquito larval present, but so far only one salt marsh mosquito larva has been identified.

Adult sampling involves the use of light traps being placed in environments preferred by the mosquito. Some 26 traps have been in place over the last year and of the 5,267 trap nights, of adult mosquito light trapping, 4,502 specimens were netted with no adult salt marsh mosquito being found

Servicing adult mosquito light trap

In addition to the eradication programme already set up in Marlborough, there is a National Surveillance Programme for the salt marsh mosquito. This involves the monitoring of approximately 60 light traps at various locations from Ward Beach in the south, to d'Urville Island in the north. So far this intensive surveillance has not identified any salt marsh mosquito or other exotic mosquito.

HOW THE COMMUNITY CAN HELP IN MANAGING PESTS

The Council's staff can help with the identification of unwanted plants and insects. If an unusual or invasive plant or insect is found on someone's property, then the Biosecurity section of the Council should be contacted for information and advice. Early intervention is important when controlling new pests and can often determine the success or failure of future control programmes.

The Council has produced 'fact sheets' for 24 pests that are in the Regional Pest Management Strategy and has made these available on the Council's website. These sheets have information on how to identify the various pests and the most appropriate methods of control. While it is important that landowners destroy any of the plant pests growing on their land, they should not be dumped in potential problem sites such as roadsides or riverbanks, as invasive plants can grow in the wild after being dumped.

There has been a specific focus in recent years on aquatic pests. Many of these pests have got into Marlborough's waterways because people have thoughtlessly disposed of the contents of their household aquarium into a local waterway. Many tropical aquarium plants and some fish species are quite capable of living in Marlborough's waterways and currently cost the Council tens of thousands of dollars to control each year. The Council, in association with the Department of Conservation, has been actively promoting the message of "Stop the Spread" of unwanted aquatic organisms around our waterways. As part of the promotion of this message a pest fish and plant programme for schools has been offered to schools throughout Marlborough. To date the programme has been presented to 41 classes. Displays on nuisance aquatic plants and fish have also been set up and manned by Council and Department of Conservation staff at the Garden Marlborough fete, boat shows and at A&P shows.

STOP THE SPREAD

Protect our waters from aquatic pests
Do not release plants and fish
into waterways

Circulation of Weed Busters information at Garden Fete