

# LAND

INDIGENOUS BIODIVERSITY **83**

BIOSECURITY ON LAND **87**

SOILS **92**

LAND COVER  
AND LAND USE **95**

DAIRY FARMING **98**

WINERY WASTE **101**

FORESTRY **106**

WASTE **110**

CONTAMINATED LAND **113**

NATURAL HAZARDS **116**

URBAN GROWTH **126**

NOISE **128**



Marlborough has a strong land-based economy that relies on good soils and good management for primary production and a healthy environment.

Farming, forestry, horticulture and winegrowing all use and have an effect on the land. The region follows national guidelines for issues such as managing dairy effluent, investigating contaminated land and biosecurity, as well as carrying out local initiatives on waste management and winery discharges.

Effects on the land are monitored, analysed and regulated by the Council as part of its role in protecting the environment for future generations. This role also includes being prepared for natural disasters such as fire, flood and earthquakes.



Flaxbourne River Valley

# INDIGENOUS BIODIVERSITY

*Biodiversity means the variety of life - both plants and animals. Looking after our biodiversity involves looking after habitat as well as the plants and animals, because they are all connected in the ecosystem.*

Marlborough has a wide range of indigenous (native to New Zealand) biodiversity and some species, such as the Marlborough rock daisy and the Marlborough green gecko are found only here. The region has many different plants and animals compared with other areas, as we are in the centre of the country and species overlap at their northern and southern limits (e.g. prostrate kowhai and kohekohe).

The Government issues guidelines for councils on biodiversity management. A 2007 report "Protecting our Places: National Priorities for Protecting Rare and Threatened Native Biodiversity on Private Land" set the following priorities:

- Indigenous vegetation in threatened environments (less than 20% remaining indigenous cover)
- Sand dunes and wetlands
- Originally rare ecosystems
- Habitats of acutely threatened indigenous species.

## PRESSURE

The Marlborough landscape has been highly modified through vegetation clearance, land drainage and the introduction of animal and plant pests since humans arrived about 750 years ago. Lowland south Marlborough has very little native vegetation cover left and is classified as a "threatened environment".

While on a smaller scale, some land in the region continues to be developed for pastoral farming and vineyards, which has an impact on native ecosystems, waterways and wetlands.

Degraded water quality as a result of poor land use practices that allow nutrients and sediment to enter waterways can have a devastating effect on instream

## CHANGES SINCE THE 2008 SOE REPORT

- Completion of Significant Natural Area (SNA) Surveys in 2009, bringing the total number of sites identified to 708.
- 46 protection projects on private land bring the total since 2004 to 85.
- 40 new Tui to Town plantings creating 4 ha of new habitat on the Wairau Plain.
- New and continuation of community groups such as Para Swamp restoration project, Kaipupu Point Sounds Wildlife Sanctuary, Grovetown Lagoon and Marlborough Sounds Restoration Trust.



Marlborough green gecko

life. High nutrient loads result in algal blooms that cover the substrate and reduce habitat available to invertebrates. Sediment smothers the substrate and severely impacts on breeding success of native fish. Instream structures such as culverts that have been installed poorly often result in fish passage barriers, preventing native fish from utilising habitat upstream of the structures.

There is often conflict between introduced species and the long-term survival of indigenous species. Pest plants such as old man's beard and wilding pines can out-compete native plants, eventually changing habitats and ecosystems.

Pest animals damage habitat through ground disturbance, grazing and predation of and

competition with native animals. There are moderate to high numbers of feral animals including goats, pigs, deer, stoats, cats, rats and mice across the region, though very little monitoring is carried out to assess the impact of these pests on indigenous biodiversity, except in some DoC managed areas.

## RESPONSE

The Council works with landowners and organisations to manage and protect biodiversity, particularly on private land. It shares this responsibility with local iwi, the DoC, QEII National Trust, Royal Forest and Bird Society, Landcare Trust and community and conservation groups. The Council's role includes:

- setting environmental policy
- assessing the effects of activities through the resource consent process
- monitoring consents and carrying out compliance
- biosecurity initiatives
- managing Council's public reserves to maintain indigenous biodiversity
- supporting community initiatives
- research and monitoring to gather information on biodiversity
- supporting private landowners to protect and enhance areas with significant natural values.

Since 2001 the Council has carried out ecological surveys on private land, as part of the SNA programme. Fourteen ecological district areas have been surveyed and over 700 diverse sites identified. In lowland areas remaining sites are often small, fragmented and often impacted by farm stock, feral animals and weeds. In some higher altitude areas in both north and south Marlborough, remaining sites are larger and in better ecological condition, although impacts from feral animals are common.

The Council's SNA programme provides advice and funding to help landowners protect the identified significant natural areas in total. Since this programme started in 2014, more than 80 projects have been carried out with about 40 of these completed in the period from 2008 to 2015, protecting in total about 500 ha through a combination of fencing, weed control and restoration planting.

There are ongoing ecological surveys to identify new significant natural area sites and a survey of wetlands was carried out between 2010 and 2014.

The Council has focused on the Wairau Plain area and has supported landowners and community groups in wetland restoration projects, new Tui to Town plantings (see case study) and some larger scale plantings and restorations projects.



Remnant native bush on Sounds farmland



Restoration wetland planting at Lake Elterwater

These efforts have created a slight increase in overall area in indigenous vegetation on the Wairau Plain from 170 ha to about 189 ha. However, this is still only about 0.8% of the land cover in the Blenheim Ecological District.

New policy and rules to control impacts on biodiversity, including wetland management and native vegetation clearance, have been developed for the review of the Resource Management Plan.

Several species-led programmes are managed by the Council's Biosecurity team specifically to protect biodiversity values. These aim to intervene early to eradicate or contain pest plants such as boneseed and eel grass (see Biosecurity section).

Work at Council Reserves with biodiversity values includes weed control at Victoria Domain in Picton, maintenance of the Koromiko Forest Reserve, native plantings at the Kahikatea Reserve near Spring Creek and several thousand native plants put in along the Taylor River in Blenheim from 2012 to 2015. This was in co-operation with the Marlborough Landscape Group.

Council continues to support community-led conservation initiatives, including riparian plantings with the Tuamarina/Blind Creek Landcare Group, foreshore plantings with the Rarangi Landcare Group, the Grovetown Lagoon Restoration Project, the Waima/Ure Ecological Restoration Society project to control old man's beard and Tui to Town plantings on private and public land.

## CASE STUDY

### Tui To Town

The Tui to Town project was launched by the Council in 2008 to encourage the restoration of native habitat and bring native birds back to the Wairau Plain. It was extended in 2014 to include the Wairau Valley and eastern Marlborough around Seddon and Ward.

Advice and funding for plants is available to private landowners to establish a minimum of 1,000 m<sup>2</sup> in new plantings. The programme's objectives are:

- to promote the planting of new areas of native vegetation to create more natural habitat for native birds
- to increase awareness about indigenous biodiversity through information, publicity and encouraging the reporting of native bird sightings.

Between 2008 and 2015 about 40 new plantings have been funded, creating about 4 ha of new native areas on the Wairau Plain. While this is a great effort by individuals, it is still a tiny proportion of land area.



Tui

## STATE

Despite positive initiatives to protect our indigenous biodiversity, the Marlborough environment is still highly modified and stressed.

A large part of south Marlborough (approx. 120,000 ha) and smaller areas of lowland alluvial valley in North Marlborough (10,000 ha) have been identified as “Threatened Environments” due to lack of habitat.

Significant parts of north and south Marlborough have goats, deer, possums and pigs that damage native vegetation through grazing and browsing. Native birds and insects are also vulnerable through competition for food and direct predation by mice, rats, stoats and possums.

As more landowners learn about the threats to indigenous biodiversity there has been a steady increase in the number of voluntary protection projects through the Council’s Significant Natural Areas Project and QEII covenants. Since 2008 the number of QEII covenants on private land in Marlborough has increased from 56 covenants covering about 2000 ha to 75 covenants covering 4000 ha.

SNA surveys have added another 18 sites since 2009, bringing the total to 708 sites covering 45,000 ha. In addition, a more comprehensive survey of wetland areas carried out between 2010 and 2012 identified about 1,300 new sites. Improvements in the ecological condition of some sites has been achieved through the SNA assistance programme (80+ sites). Recent re-visits to a selection of other sites that have not been actively protected has indicated that the majority of sites are either in a stable or deteriorating condition.



#### WANT TO FIND OUT MORE?

- The New Zealand Biodiversity Strategy (2000)  
[www.biodiversity.govt.nz/picture/doing/nzbs/contents.html](http://www.biodiversity.govt.nz/picture/doing/nzbs/contents.html)
- Protecting our Places – National Priorities for Protecting Rare and Threatened Native Biodiversity on Private Land (2007)  
[www.biodiversity.govt.nz/land/guidance/](http://www.biodiversity.govt.nz/land/guidance/)
- The MDC website has annual newsletters and reports on the Significant Natural Area and Tui to Town projects, as well as native planting and restoration guides for north and south Marlborough.

Several large community-based restoration and weed control programmes have been active in Marlborough since 2008. The Marlborough Sounds Restoration Trust and the Kaipupu Point Mainland Island Society continue to target plant and animal pests in the Marlborough Sounds. The Para Wetland restoration project, established in 2010 by Fish and Game, focuses on willow control and wider wetland restoration across the 120 ha site near Koromiko.

## FUTURE RESPONSE

The Council plans to continue its voluntary and practical approach to working with landowners to protect significant natural areas on private land in the region. A selection of sites will be monitored to ensure these efforts are effective.

The Council also intends to refine the rules around clearing indigenous vegetation because there is so little remaining in the “Threatened Environments” and coastal margins.

Work on a Council Biodiversity Strategy is under way to help guide future priorities and co-ordinate action across Council’s different departments and in time, across the whole region.

As part of meeting the national priorities set out by the Ministry for the Environment in 2007, work needs to be done to identify dune-lands and naturally rare ecosystems in Marlborough. Further work should also be carried out to identify habitats of threatened species on private land. Council staff are involved in a national project to develop a standard set of biodiversity monitoring indicators to assess the state and trends of our indigenous biodiversity.

The Council will continue to work alongside other agencies and community groups to manage and promote the protection of indigenous biodiversity in Marlborough.



Possum Swamp Wetland

# BIOSECURITY ON LAND

*Biosecurity is about protecting the environment from biological threats - that is, pest plants and animals. Some of these are introduced (e.g. possums), while others arrive by mistake (eg. Chilean needle grass). Some pests, such as moth plant, have spread from home gardens to naturalise in the wild and smother native vegetation.*

The Council has been managing pest species for some time, traditionally focused on the primary sector, especially pastoral farming. Managing pests today involves a broader approach and includes protecting native species and habitats.

Councils have been mandated to provide regional leadership in biosecurity and pest management with programmes that benefit the economy and environment. The Marlborough District Council is developing a Regional Pest Management Plan and must make some tough choices in prioritising limited resources.

## PRESSURE

### Increased impact from established pests

A number of pests are well-established within Marlborough. These include Chilean needle grass (CNG), Nassella tussock and wilding conifers. CNG and Nassella tussock are generally not palatable to stock and can cause harm to animals. CNG seed heads burrow into animals' hides and organs, while Nassella blocks digestion, causing starvation. Wilding conifers spread by wind from plantations and farm trees can quickly dominate in open high country, altering the landscape and taking up water needed further down the valley. Without ongoing active management and education, these established pest plants will become an even greater risk to the environment and economy.

## CHANGES SINCE THE 2008 SOE REPORT

- Reduction in rabbit population levels, and they being maintained at low levels- Increase in the number of properties infested with Chilean needle grass.
- Increasing level of resource required to maintain areas free from wilding conifer infestation.
- Increasing threat from new pest species, such as wallabies becoming established in Marlborough from illegal liberation.
- Nassella tussock continues to remain manageable by land occupiers.



Nassella Tussock

Bovine tuberculosis (TB) can have dramatic impacts on cattle farmers through lost export earnings and the stress of having an infected herd. TB is still present in wild animals and one herd of livestock in the Upper Awatere Valley and requires ongoing management throughout the region.

## New species establishing

Marlborough, as with most of New Zealand, is vulnerable to the arrival of pests. New species such as Argentine ants can take time to establish in a region and can remain undetected until they reach population levels which are then difficult to control.

## Increased ways a risk can spread

Our growing economy and international trade increases the risk of new pests and weeds arriving in Marlborough. These can come in on farm and tourist vehicles, stock travelling through or grazing from other parts of the country, changes in land use and even in pot plants from new residents shifting into the area.

## Lack of public awareness of pest issues

Most of the plants that become biosecurity issues have “jumped the fence” from urban gardens, either through seeding, spreading or weeds being dumped off properties. Pests such as moth plant and Chinese pennisetum are well established, but the lack of public awareness increases the threat of further spread and the incursion of new pest plants.

## RESPONSE

The Council takes a two-pronged approach to managing biosecurity threats: regulatory (setting legal requirements on landowners and compliance) and non-regulatory (education, awareness and community programmes).

### Regulatory approach

The Council has developed a Regional Pest Management Strategy (RPMS) under the Biosecurity Act 1993. This puts pests into three categories:

- Species that are established and have an ongoing impacts
- Species in the early stages of establishment
- Species that pose a real threat of establishing

Established pests are top priority, but there needs to be an effective and achievable goal to contain their spread. For instance, the Council does not have the resources for widespread control of old mans beard and banana passionfruit both of which are now abundant in many places. These species are managed only at certain ecological restoration sites.

Wilding pines in the Clarence Valley





The RPMS contains objectives, programmes and rules that can place obligations on land owners or occupiers to help control pest species. This may involve monitoring on rural properties to make sure owners are managing the pest species or responding to pest threats that arrive in Marlborough from elsewhere.

### Non-regulatory approach

Education and raising public awareness about pest issues is an important part of the Council's biosecurity work. The main objective is to provide landholders and people within the community with an understanding of regional biosecurity issues. This knowledge helps land owners make good practical decisions to minimise the spread of established pests and prevent new species taking hold. Early detection of pest species reduces the costs to landowners of lost productivity and trying to control pests once they are established.

The Council carries out research to better understand or develop new tools to fight pest species and staff manage funding programmes to help landowners.

### Wilding conifer management

Wilding conifers (often called wilding pines) are common in parts of both north and south Marlborough. Some have spread from early soil conservation planting in the Wye and Branch/Leatham Valleys. These involved species such as *Pinus contorta* that are now prohibited because of their known spread risk. Regulatory control work is carried out to try to stop more pines spreading from the Wye and Branch/Leatham catchments.

*Pinus radiata* is a common farm and plantation tree that also spreads readily in Marlborough. It is the target species in the Sounds.

Most wilding pine control work in the region has been carried out by the Marlborough Sounds Restoration Trust (MSRT), which receives financial and logistical support from the Council. The MSRT has taken a strategic approach to wilding pine control in the Marlborough Sounds, starting in Queen Charlotte Sound / Totaranui, D'Urville Island and Kenepuru

Sound. Pines are drilled and poisoned so they die where they stand, allowing native bush to regenerate and dominate again. Since 2008 the MSRT, a voluntary trust, has spent more than \$1.2 million on wilding pine control in the Sounds.

DoC actively manages wilding pines on public conservation land, often in partnership with the MSRT. Council has carried out some wilding pine control in partnership with landowners on farms where significant natural areas have been identified. Land owners have also undertaken a large amount of control; for example DoC and Landcorp Farming on Molesworth. All of these initiatives are non-regulatory as collaboration has been found to produce the best results.

### Bovine TB

Under the 1998 National Pest Management Strategy for bovine tuberculosis there is a single, centralised approach to managing bovine TB that combines disease management, controlled livestock movements and wildlife vector control (mainly possums).

Vector management and disease control is managed by TBFree NZ, a government-industry partnership that also receives funding from local Councils. Its mission is to eradicate bovine TB and it is well on the way to that in Marlborough, where the number of infected herds has dropped from 36 to 1, as of 2015.



Moth plant

## Total control pest plant species

The Council controls a range of pest plants with the aim of either eradicating them or containing infestations at very low levels. This is to prevent further environmental impacts such as the smothering of native vegetation.

There has been a longstanding management programme for Moth Plant, Chinese Pennisetum and Boneseed resulting in a significant drop in the number of plants in the past 10-15 years.

## STATE

The main biosecurity threats in 2008, such as CNG, Nassella tussock and wilding conifers, are still present and pose a persistent and ongoing risk. Control programmes are “holding the line” but are under increasing pressure - for example, CNG has slowly been increasing in distribution since 2008, though the use of Taskforce® Herbicide has reduced the density on many properties (see case study).

The emerging threat to biodiversity of invasive pest plants has been managed through the Council's RPMS. There has been a dramatic drop in all total control plant species due to the Council's work at known sites and ongoing surveillance to check for any new infestations.

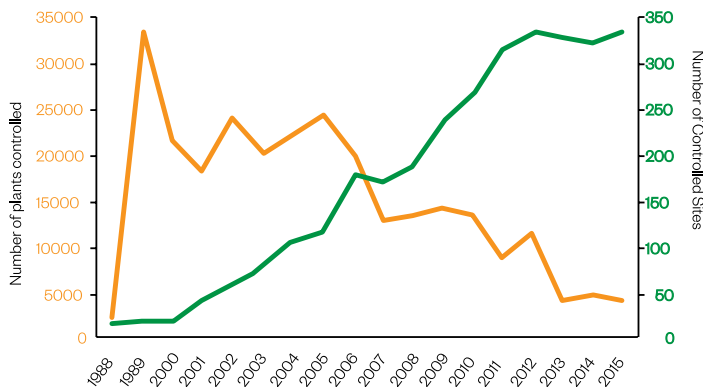


Figure 1: Trend in the number of Total Control pest plant species controlled

### WANT TO FIND OUT MORE?

- Annual Operational Plan Reports: [marlborough.govt.nz/Environment/Biosecurity/Regional-Pest-Management-Strategy-and-Operational-Plan.aspx](http://marlborough.govt.nz/Environment/Biosecurity/Regional-Pest-Management-Strategy-and-Operational-Plan.aspx)
- Marlborough Sounds Restoration Trust [www.soundsrestoration.org.nz](http://www.soundsrestoration.org.nz).

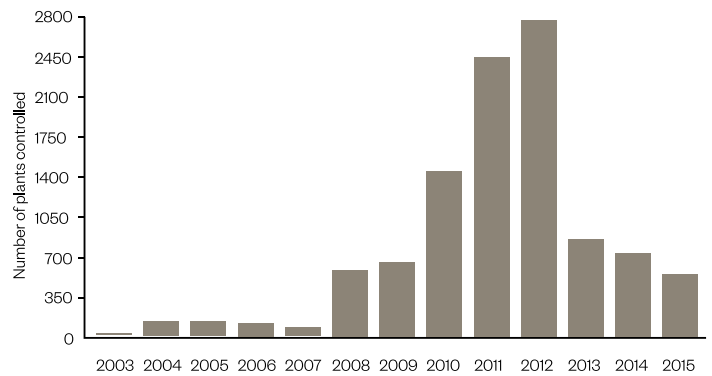


Figure 2: Moth plant control

A new emerging threat is the possible spread of wallabies to Marlborough. Both Bennett's wallaby and dama wallaby are well-established in some parts of New Zealand and their grazing causes significant damage to pasture and native bush. The drylands of South Marlborough would be suitable for Bennett's wallaby and the forested habitats of the Marlborough Sounds ideal for dama wallaby. Both species would pose a severe and long-term threat if they were to establish.

## FUTURE RESPONSE

The Council is reviewing its Regional Pest Management Strategy (RPMS) after amendments to the Biosecurity Act 1993. The new regulatory tool will be a Regional Pest Management Plan (RPMP), which provides an opportunity for the Council to take a wider view of how it leads and provides biosecurity services. As a result, Council is developing a Biosecurity Strategy that will:

- state a clear and concise vision for biosecurity
- outline key parties involved in Marlborough biosecurity
- detail the services that the Council will deliver
- set priorities for resourcing biosecurity programmes, and
- set priorities for education and awareness programmes.

The new RPMP proposes to declare all wallaby species “exclusion pests”. This will enable the Council to regulate activities that may result in the spread of wallabies and set out how it would respond to any sightings in Marlborough.

The Council is committed to continued control of wilding conifers using both regulatory and non-regulatory programmes to address the threat.

## CASE STUDY

### Chilean needle grass (*Nassella neesiana*)

Chilean needle grass (CNG) is an invasive weed that can take over productive pasture particularly in dry areas like South Marlborough. Sheep and cattle do not like to eat it and the seed digs through their skin, downgrading the value of pelts, meat and wool for export.

CNG has been found across around 2,800 ha in Marlborough. It is also established in Hawkes Bay and small areas of North Canterbury. The biology of the plant ensures it can spread easily and if left unchecked it quickly dominates dry grassland areas. Even though CNG has been in Marlborough for 70 years, there is little public awareness about the plant, its risk to our region or its ability to spread to other regions.

CNG seed is very sharp and spreads by attaching itself to anything that brushes past - stock, people, vehicles and machinery. Seeds can also be spread into new areas in bales of hay. Most of Marlborough's CNG infestation is in the Blind River/Grassmere area between Seddon and Ward, where large swathes of land are dominated by the weed. Other smaller, scattered infestations have been found in Fairhall, Blenheim, Redwood Pass, Spring Creek and the Awatere and Wairau Valleys.



Council staff controlling chilean needle grass on road side

It has been hard to control CNG because until recently there was no suitable chemical response. In response to this, the Council encouraged the research into and registration of Taskforce, a herbicide new to New Zealand that has some success in managing CNG.

In 2012 the Council broadened its approach by helping landowners with the cost of the herbicide and since 2014 has supported a community action group to raise awareness. This has increased the educational displays, presentations and general awareness in Marlborough.

Between 2008-2015 the mapped area of CNG increased by 149 ha. Between six and ten infestations are found on new properties each year. As public awareness grows, landowners may be noticing and reporting CNG for the first time, even though it has been on their property for a while.



Wilding Pines

Bone seed in full flower

# SOILS

*Soils are at the heart of our economy and environment, supporting Marlborough's agriculture, winegrowing and forestry and complementing our clean green tourism image. We build our homes, factories, roads and railways on soils. We also rely on soils to support our ecosystems, not only as a medium to grow plants but also to hold on to water and filter wastes and nutrients.*

Under the Resource Management Act the Council must promote the sustainable management of the natural and physical resources of the region, including monitoring and reporting on our soil.

## PRESSURE

Pressures on Marlborough's soil resources can be caused by nature as well as humans.

Since 2008 there have been three large storm events with intense localised rainfall in different parts of Marlborough, causing multiple landslides and erosion. These occurred in 2008, 2010 and 2012. The effects of these storms were felt in rivers, estuaries and coastal waters as well as on soils.

Human activity also has an impact on the character and quality of our soils:

- pollution from industry may cause long-term soil contamination
- some intensive farming practices can increase soil erosion or compaction and change the chemistry of the soil
- clearfelled forests, especially on steep slopes, create expanses of bare ground vulnerable to storms and erosion until the next crop of trees is established.

Soil disturbance has an impact on other parts of the environment, for example water quality. Stable soil acts as a buffer to capture and store nutrients such

## CHANGES SINCE THE 2008 SOE REPORT

- Three large storms: 2008, 2010 and 2012.
- Expanded SOE monitoring to include 118 sites.
- Soil compaction and pugging issues were identified at some sites due to use of machinery or grazing of livestock during wet conditions.
- Five soil characterisation studies have been completed.



Soil profile

as nitrogen and phosphorous, treat a range of waste products and store and filter water.

## RESPONSE

### Soil mapping and characterisation

Soil mapping information in Marlborough is not comprehensive for all areas. Council has detailed information for soils mapped on the Wairau Plain and the lower Awatere Valley at a 1:50,000 scale, while the rest of Marlborough has outdated 1:250,000 scale soil mapping information.

The Council has characterised soils in the Wairau Valley, Koromiko, Rai/Ronga catchment, Linkwater/Kaituna and the Wither-Redwood Hills. This information will help landowners manage activities such as irrigation, effluent application and moving stock to reduce the impact on their soil. Council and industry will also use the information in scientific modelling to help protect our natural resources. This is a first step towards more detailed soil mapping at the 1:10,000 scale.

## Soil monitoring

The Council's soil quality monitoring has expanded since 2008. Staff collect samples from 118 soil quality monitoring sites that represent four soil orders (brown, pallic, gley and recent) and six land uses (dairying, exotic forest, cropping, native vegetation, drystock and viticulture). Samples are analysed for physical, biological and chemical properties that are good indicators of soil quality. The detailed data from monitoring provides information on the effects of land use on soil quality and whether we need to change the way land is managed.

Two issues that were highlighted through the first monitoring cycles have led to further studies by the Council. They are trace element concentrations in soils (arsenic, cadmium, lead, zinc, chromium, copper, nickel and fluorine) and soil compaction/pugging.



### WANT TO FIND OUT MORE?

- [www.marlborough.govt.nz/Environment/Land/Soils.aspx](http://www.marlborough.govt.nz/Environment/Land/Soils.aspx)
- Gray, G.W. (2014) Soil Quality in the Marlborough region in 2013. Technical publication RE500/2014/016 for the Marlborough District Council.
- Gray, G.W. (2011) Trace Element Concentrations in Some Marlborough Soil. Technical publication 11-002 Marlborough District Council
- Gray, G.W. (2011) Survey of Soil Compaction/Pugging in Some Marlborough Dairy Farm Soils. Technical publication 11-013 Marlborough District Council
- Ulrich, S.C (2015). Mitigating fine sediment from forestry in coastal waters of the Marlborough Sounds. Technical publication 15 009 Marlborough District Council



Poor farming practices creates soil pugging

## Soil stability

In 2009 the Council undertook a study to set up baseline monitoring of soil stability in Marlborough.

There is an increased focus on compliance at forestry harvest sites after community concern about run-off and erosion, particularly after the large storm events.

Council has undertaken a review of the causes and consequences of fine sediment impacts from forestry on seabed environments in the Marlborough Sounds. This involved evaluating 35 years' of scientific studies in the Sounds and identifying a range of mechanisms that can help reduce the amount of sediment that enters coastal waters.

## STATE

The characterisation studies undertaken between 2011 and 2014 add new information about the general soil types in the Wairau Valley, Koromiko, Rai/Ronga catchment, Linkwater/Kaituna and Wither-Redwood Hills.

Compaction and low aggregate stability has been seen in soils used for vineyards, dairying and cropping. This is likely to be related to heavy grazing or grazing and machinery use under wet conditions. Compaction can affect pasture production and increase the risk of nitrogen, phosphorous and microbial run-off or leaching into waterways. Efficient nutrient budgets and management plans will help minimise the effects of this on water quality and should be used by all land managers.



Soil sampling

A number of the viticulture sites studied showed evidence of soil compaction, especially between the vines where machinery is used to mow, spray, harvest and prune. While machinery plays an integral part in running a vineyard, this work needs to be avoided when the soil is wet.

A small number of the drystock pasture sites also showed evidence of soil compaction. A larger number had low phosphorous and there were a few instances of elevated fluorine. This can be toxic to grazing animals and if soil fluorine concentrations continue to increase, farmers need to maintain good pasture cover, reduce the number of stock (especially during winter), and keep stock off recently fertilised pastures.

Refer to the Forestry chapter for soil monitoring on forestry blocks and the effects of harvesting.

## FUTURE RESPONSE

The soil quality monitoring programme will continue to gather information to keep the Council and community informed about the state and trends in Marlborough's soils. Future work will focus on re-sampling established sites to determine whether there are any trends in soil quality and to establish new monitoring sites as resources allow.

Declining soil quality can usually be offset by better land management practices such as nutrient budgets/ plans and changing grazing practices when the soil is very wet. Council will continue to educate land managers on strategies to protect the environment while achieving an economic return from the land.

It would be ideal to have more detailed soil mapping at the 1:10,000 scale for more parts of Marlborough. This would build on the areas where recent soil characterisation has been completed.

Farm scale soil mapping (1:5,000) would help identify soils that do not drain well. This should be done on a site-by-site basis as part of planning to apply effluent or irrigation.



Slip from forest harvest site after rainfall event

# LAND COVER AND LAND USE

*Good information about changes in land cover and land use provides an insight into pressures on the environment, including the impacts on water quality, soil and erosion. Land cover and land use are related, but different; land cover describes the vegetation present, for instance pasture or indigenous forest, whereas land use describes the activities on the land, such as dairy farming or forestry.*

Land cover is affected by changing activities on the land (e.g. pasture once used for sheep and beef farming now being used for intensive dairying), along with natural pressures such as climate and geology.

Land cover information is captured on the national Land Cover Database which uses satellite imagery and other tools to create a map overlay. For more specific Marlborough information the Council carries out field surveys. These include a focus on viticulture and forestry where there has been a lot of change in land cover.

## PRESSURE

The desire for economic growth is the biggest driver in changing land cover and land use. As markets shift, landowners often change their land use to gain higher returns from their property. In Marlborough this has been particularly prevalent, with a shift from farming to winegrowing and forestry.

These activities have resulted in an increased demand for water, diverted waterways, recontoured land, the removal of shelterbelts and trees and a reduction in the amount of water available.

The conversion of low-density pasture land into forestry on the southern hills has had a downstream effect on other land users. Forestry plantations take up more water than pasture, so there is less available for other users further down the valley.

## CHANGES SINCE THE 2008 SOE REPORT

- 5,000 ha of land converted from hill country pastoral use to plantation forestry.
- After a very rapid increase from 2 to 20,000 ha in the decade before 2008, only approx 2,000 ha of new vineyards have established since 2008.
- Small areas of rural land are being converted to residential and industrial land use around Blenheim, but only after extensive investigations into issues like soil contamination, risk of liquefaction and sea level rise.



Vineyard expansion into Waihopai Valley

Changing land use to intensively grazed livestock also has the potential to harm water quality. A 2013 report by the Parliamentary Commissioner for the Environment shows a clear correlation between land converted into dairy farms and an increase in nitrogen in the water.

## RESPONSE

The Council carries out regular desktop studies and field work to keep track of the main land use changes, with vineyards and commercial forestry mapped each year.

Winegrowing and forestry are permitted activities under Marlborough's current Resource Management Plans, although some associated activities such as water use and earthworks may require resource consent. Winegrowing and forestry (especially harvesting) can have a significant effect on landscape values. These issues are being considered as part of Council's policy review process and the new Resource Management Plan, in consultation with industry groups.

A plan change in 2013 now requires new or expanded dairy farms to obtain a resource consent to manage water quality and other environmental impacts.

Table 1: Marlborough land cover

### MARLBOROUGH LAND COVER

Land Cover	Area in hectares	Percentage covered
Indigenous vegetation	164,909	16%
Indigenous forest	362,035	34%
Pasture/grassland	311,258	30%
Exotic forest	82,245	8%
Gravel, rock, sand (including alpine areas and river beds)	79,144	7.5%
Horticulture/Viticulture	32,891	3%
Exotic woody vegetation	10,791	1%
Lake/estuary	3,585	0.3%
Urban, roads, artificial surfaces	3,090	0.3%

Landscape group inspects a Wairau Plain planting





The Council maintains close connections with primary industries through the compliance department, policy development and initiatives such as the Marlborough Environment Awards, which showcase positive examples of sustainable business.

In 2002 the Council established the Marlborough Landscape Group after community concern about the rapid increase in vineyards and loss of wetlands, shelterbelts and historic trees. This group continues to advise the Council on landscape issues and includes representatives from the wine industry, forestry, farming, local businesses and environmental groups.

## STATE

The Land Cover Database and the Council's annual field surveys show little change in land cover or land use in many parts of Marlborough in recent years, although there has been some conversion of pastoral land to vineyards and commercial forestry.

Between 1997 and 2008 the area in vineyards dramatically increased from 2,655 ha to 22,277 ha (April 2008). Since 2008 that area has only increased to 23,769 ha (September 2013). The new plantings were mostly in the Wairau Valley and some infill areas around Seddon. However, the pastoral land use has not been entirely lost, with many vineyards providing winter grazing for sheep.

Commercial forestry has been established on land that was previously used for extensive pastoral farming or had native and exotic shrub cover. Most of this expansion has been in the Waihopai catchment, with 5,000 ha of new commercial forest since 2008.



### WANT TO FIND OUT MORE?

- Parliamentary Commissioner for the Environment (2013) Water quality in New Zealand: Land use and nutrient pollution (p.29)
- Land Cover Data Base [www.mfe.govt.nz/more/environmental-reporting/about-environmental-reporting-nz/classification-systems-environmental](http://www.mfe.govt.nz/more/environmental-reporting/about-environmental-reporting-nz/classification-systems-environmental)



Vegetation cover typical of inland Marlborough high country.

Several vineyards have been converted into land for housing. This raises potential issues of soil contamination from chemically treated vineyard posts. A Council study on the impact of treated vineyard posts indicated there was some leaching of copper, chrome and arsenic close to the posts, so this may need to be remedied where the land use changes.

Since 2008 new land has been sought for residential expansion around Blenheim. Land use issues to be considered include soil contamination, the loss of high quality productive soils, rising sea levels, tsunami and risk of liquefaction from earthquakes.

The most dominant land cover in Marlborough is native vegetation - a combination of indigenous forest, alpine and sub-alpine vegetation, tussock grasslands, manuka and kanuka, grey shrublands, flax and fern lands. Most of this land cover is on the large areas managed by the DoC and at high altitudes.

## FUTURE RESPONSE

Council will continue to monitor and map significant land cover and land use changes in Marlborough. Where these changes have the potential to create adverse effects on the environment, the Council will carry out its roles in policy development, monitoring and compliance to promote sustainable management under the Resource Management Act.

# DAIRY FARMING

*Unlike other regions of New Zealand, dairying in Marlborough is a relatively small industry with many small, family-owned farms.*

About 75% of Marlborough's dairy farms are in the wetter north of the region. There were 56 dairy farms in the region in 2015, compared with 61 in 2007. However, the number of dairy cows increased by about 15% during that time.

The main environmental issues around dairy farming are water quality and managing effluent. In 2003 Fonterra joined forces with central and local government to produce the Clean Streams Accord (replaced by the Water Accord in 2012) to set guidelines and a code of practice to manage stream crossings and dairy effluent. The accords aim for clean and healthy waterways in dairying areas.

The Council has a responsibility to ensure that dairy effluent systems and stock access to streams comply with the Resource Management Plan rules and resource consent conditions. Along with Fonterra, the Council has also been encouraging farmers to upgrade their discharge systems to meet industry targets.

## PRESSURE

Dairy farms can have an adverse impact on water quality with nitrates, *E. coli* (from faecal matter), phosphorus and suspended sediment contaminating waterways. This may be caused by:

- poor nutrient management (applying too much effluent and fertilisers to paddocks or applying during wet weather)
- overstocking of cows
- overflowing effluent ponds
- stream crossings where cows instinctively stop and defecate into the water
- run-off from race-ways and cattle yards
- poorly constructed or maintained silage pits
- non fenced waterways allowing cows direct access to flowing water.

## CHANGES SINCE THE 2008 SOE REPORT

- The number of dairy farms has decreased, but stock numbers have increased.
- As at June 2015, 85% of stream crossings have been eliminated, falling short of the total exclusion by 2013 target.
- A small number of dairy farms have upgraded their effluent collection, storage and discharge systems to industry best practice.



Fencing cattle from waterways helps protect water quality

A number of Marlborough dairy farms have older infrastructure that is not up to standard and very few farmers have detailed information about the soil types on their farms or nutrient management programmes.

Most Marlborough catchments with dairy farms have elevated nitrogen and *E.coli* levels, but the impact on waterways is reduced because there is still a lot of native forest cover and dairying takes up only a small proportion of land use within the catchment. In catchments with dairy farms water quality generally ranges from fair (conditions sometimes depart from desirable levels) to marginal (conditions often depart from desirable levels) in catchments with dairy farms.

## RESPONSE

The Council makes an annual inspection of all dairy farms focusing on stream crossings and how effluent is managed.

The Council uses nationally agreed criteria for effluent management to assess which category the farm falls into.

1. Compliant – the farm's dairyshed effluent system is operating within the Plan rules and resource consents
2. Non-compliant – a rule or consent condition has been breached but action can be taken to become compliant
3. Significantly non-compliant – when one or more of the following is found:
  - an unauthorised discharge has entered water (ground or surface water)
  - an unauthorised discharge may enter water (ground or surface water)
  - a breach of an abatement notice
  - objectionable effects from odour
  - system shortcomings
  - multiple examples of non-compliance with cumulative effects.

Where farms are not up to standard, Council staff work directly with farmers on remedial action and follow up with inspections and ongoing communication. The Council has also worked closely with industry groups and is developing new policy to protect water quality as part of its review of the Resource Management Plans.

A number of farms have upgraded their effluent systems since 2008 and these provide positive local examples.

### Policy

A plan change in 2013 enables the Council to manage the effects of new dairy farms on water quality by putting controls in place through resource consents.

A number of older dairy farms are considered compliant under their historic consent conditions and current Resource Management Plan rules. However, some may not meet the industry best practice standards that are proposed under the new Resource Management Plan, which aims to improve



Irrigating dairy effluent to pasture

environmental management on dairy farms and set clearer performance standards.

### Non-regulatory approach

In 2008 the Council increased its water quality monitoring in the Rai catchment to better understand the impact of dairy farming in the area.

Following a NIWA report that identified a number of areas needing attention in Marlborough, a dairy working group was established in 2011. It includes representatives from Fonterra, Dairy NZ, the NZ Landcare Trust, several farmers and the Council. The group has contributed to the development of Council policy and has supported the Council's Environmental Farm Plan Programme to help farmers identify what work needs to be done and set priorities.

Six farm plans were completed in 2012, but due to low demand the 2014/15 funding was redirected to create three detailed Nutrient Management Plans as a learning tool for farmers and staff.

### Regulatory

The annual compliance programme focuses on dairyshed effluent systems and stream crossings but may also include other issues based on monitoring or complaints received. Between 2008 and 2015 this programme was stepped up to allow more follow-up time with farms that were rated as non-compliant. A further inspection and request for more information usually led to an improvement.

In 2012/2013 the Council prioritised on-farm visits to focus on those with poor infrastructure or repeated non-compliance. This process to help improve operating standards is continuing.

A 2007 survey of all Marlborough dairy farms identified 229 stream crossings. In consultation with farmers the Council decided to target crossings that had the greatest impact based on herd size, frequency of use, size of waterway crossed and flow in the waterway. The crossings were classed as high, medium and low priority. Fonterra and Council set a target of zero stream crossings and all waterways fenced by the end of 2013.

## STATE

Dairyshed Effluent Surveys have shown that the number of compliant farms has increased substantially since 2009 and the number of significantly non-compliant farms had remained fairly low until 2014/15. The increase during this period was due to a change in the Council's procedure where farms that repeatedly offended would be reclassified as significantly non-compliant.

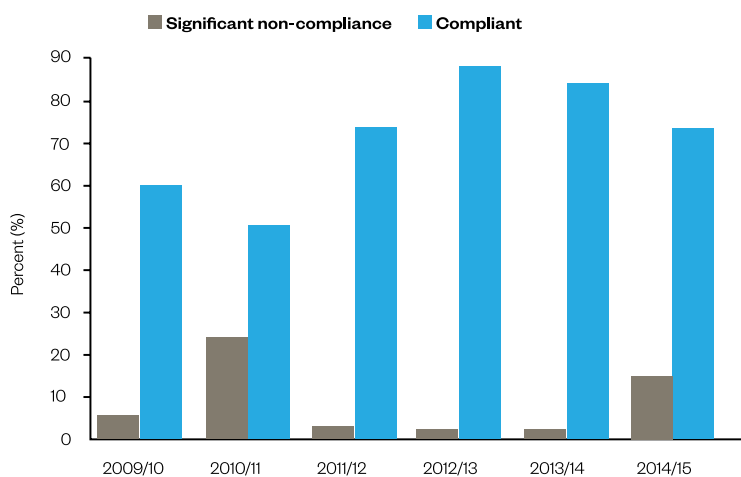


Figure 1: Dairyshed effluent survey compliance



### WANT TO FIND OUT MORE?

- Rai Catchment Management Plan, prepared for Marlborough District Council by NIWA, February 2011. NIWA Client report no. HAM2011-056. Bob Wilcock.
- Dairy Environmental Farm Plan Programme, July 2013.
- State of the Environment Surface Water Quality Monitoring Report, 2014. MDC Technical Report No: 14-006. ISSN (Online) 1179-819X. ISBN 978-1-927159-50-7.
- Dairyshed Effluent and Stream Crossing Survey 2014/2015, MDC report No 15-003. ISSN 1179-819X (Online). ISBN 978-1-927159-54-5.

It should be noted that many farms that are currently "compliant" may not meet the industry best practice standards that will be required in the near future.

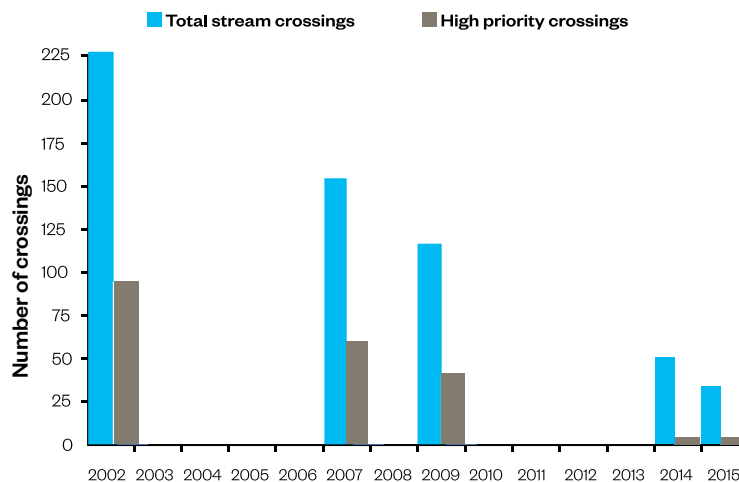


Figure 2: Outstanding stream crossings requiring remediation

All stream crossings were due to be eliminated by the end of 2013. However, despite huge gains over the past seven years there were still 34 stream crossings that had not been eliminated by the end of the 2014/15 dairy season.

Once stock were kept out of waterways there was a significant improvement in water quality in the Rai River, including a drop in *E. coli*. This effort was rewarded by the Rai River receiving a New Zealand River Award in 2013. The award recognised efforts by dairy farms to improve effluent management and eliminate stream crossings.

## FUTURE RESPONSE

The Council will continue to work with industry through the dairy working group and other initiatives to establish the requirements of the revised Resource Management Plan. Enforcement action may be required to eliminate the remaining stream crossings and the compliance team will also work closely with farmers to ensure dairy effluent systems are up to standard.

The Environmental Farm Plan Programme is unlikely to continue, but there are opportunities for programmes that encourage riparian planting and fencing of waterways.

# WINERY WASTE

*Marlborough's wine industry has expanded rapidly, with vineyards covering 23,203 ha in 2015 producing 75% of New Zealand's wine.*

This makes Marlborough the largest wine region in New Zealand and with that comes the challenge of dealing with the two waste streams from winemaking:

- winery wastewater from cleaning floors, equipment, fermentation tanks and barrels
- grape marc, made up of the skins, pulp, seeds and stems left after the juice is extracted.

Marlborough's wineries vary in size from small boutique operations to large industrial plants, with processing capacities ranging from 50 to 40,000 tonnes. Although there are a few in the Awatere Valley, most wineries are on the Wairau Plain and operate in either the Rural Zone (where the discharge of wastewater is to land) or the Industrial Zone (where wastewater is piped out to the Council's treatment ponds in Riverlands).

The load is seasonal, with the greatest volumes of wastewater generated during the weeks when the grapes are harvested, usually in March and April. This peak period ("vintage") needs to be managed carefully to avoid contamination of land and waterways and odour issues.

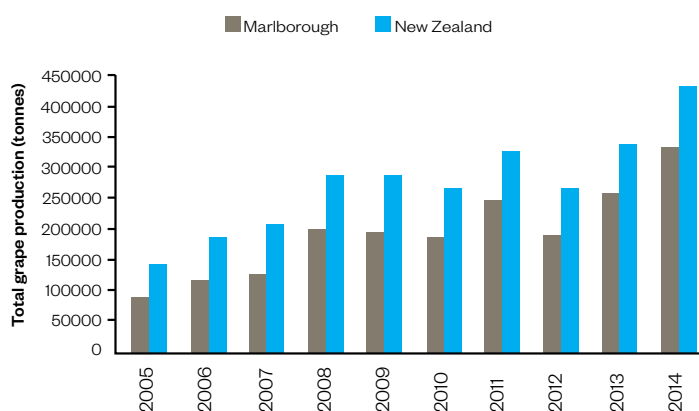


Figure 1: Total grape production in Marlborough and New Zealand. (New Zealand Winegrowers, Annual Report 2014)

## CHANGES SINCE THE 2008 SOE REPORT

- Council continues to undertake annual inspections of all rural wineries during vintage time.
- Vintage variations in yields and adverse weather conditions provide ongoing challenges for the wine industry.
- A number of wineries have made significant investments into upgrading their wastewater systems, disposal areas and grape marc storage.
- In general, wastewater management record keeping and compliance rates have improved, with no significant issues of ponding wastewater being observed in the last four years.

## PRESSURES

### Winery wastewater

The need for land space to accommodate the increase in winery waste discharges has raised concerns about the impact on soils. Discharge to land is preferable to discharge to water, but it must be managed in a way that does not degrade the soil.

The ability of soils to dilute and assimilate nutrients, salts, organic load and contaminants needs to be carefully considered for each site. Typically, winery wastewater has a high salt (sodium and potassium) concentration from cleaning chemicals and sediment residues from fermentation. The pH level also varies depending on cleaning products and adjustments made to the wastewater. An excess of any of these elements can harm soil structure and plant health.

Vineyard, pasture, crops and woodlot areas irrigated with winery wastewater receive a higher salt loading compared with irrigation from groundwater or surface water and the build-up of sodium and potassium in the soil is a potential concern.

Ponding in the disposal field creates a build-up of wastewater. It may be caused by several factors, including irrigation rates being too high, wastewater

applied to soils that have reached field capacity, the disposal field is not being big enough or poor management, such as discharging during rain, blockages or mechanical issues.

Over-irrigation can cause salts, organic carbons (such as sugar and ethanol) and nutrients (including nitrogen and phosphorous) to leach into groundwater, which may have downstream effects on surface water quality.

## Grape marc

About 40,000 tonnes of grape marc is produced by the Marlborough wine industry each year. Very little is known about the composition of fresh grape marc and its impact on soil quality and structure.

Results from a 2012 Council study indicate that grape marc and its leachate have the potential, depending on location and conditions, to cause adverse effects on the environment. These include:

- Soil structure changed by the accumulation of potassium
- Soil contamination
- Surface and/or groundwater contamination by nitrogen, phosphorus and organic nutrients through leaching, runoff and/or direct discharge
- Odour and/or loss of visual amenity from poorly-managed discharges

## RESPONSE

### Winery wastewater

As with any land-based application system, it is important to maintain soil and plant health to allow nutrients, salts and contaminants to be diluted and assimilated. The Sodium Absorption Ratio (SAR) is the measurement commonly used to characterise

salt-affected soils. The Council has guidelines available for applying wastewater to soil, including recommended SAR thresholds to prevent the build-up of salts.

The Council started monitoring winery waste annually in 2002 and 37 rural wineries are now inspected during vintage. This monitoring looks at the management of wastewater discharges to land and evaluates the effects winery waste might have on the environment. This includes reviewing wastewater and soil sampling laboratory results, nitrogen loading

rates and discharge volumes and rates. Each winery is informed of any issues that need attention.

Annual monitoring is also an opportunity for Council staff to assess whether the winery is complying with its resource consent conditions and the rules in the Wairau/ Awatere Resource Management Plan.



Spreading grape marc in vineyard

The Council's Compliance Group meets with wineries to discuss areas of non-compliance and expectations in an effort to work with the industry. Education and relationship-building are key objectives and there is good co-operation from the industry. The emphasis is on continuous improvement to reduce environmental impacts as well as minimising compliance costs for the Council and wine companies.

The Council is a founding partner of the Cawthron Marlborough Environment Awards, which aim to recognise companies that are leading the way in good environmental practice. (See Case Study: Matua Wastewater Treatment).

### Grape marc

Council staff assess the effects of grape marc during winery waste inspections and take a similarly co-operative approach with the industry when it comes to compliance.

Council undertook an investigation in 2013 to assess



Irrigation of winery wastewater to land

the chemical composition of fresh and aged grape marc and the potential environmental impacts of storing grape marc on land. The study recommended measures to minimise impacts on soil and water, including:

- setbacks from water bodies
- stockpiles to be sited on impermeable surfaces
- stockpiles to be covered to prevent leachate runoff
- provide ways to collect leachate around stockpiles.

These measures, along with recommendations to limit odour, are being considered in the review of the Marlborough Resource Management Plan.

The Council is a key supporter of the Marlborough Grape Marc Group, set up by some of the region's largest wine producers to manage grape marc disposal. As well as compost and stock feed, the group is working to find commercially viable by-products from grape marc.

## STATE

Since 2012 the Council has used a traffic light system to assess whether wineries are complying with their resource consent conditions and plan rules. Red is non-compliant and requires remedial action. Orange means there have been relatively minor breaches requiring corrective action. Green is compliant and no action is required.

In 2015, a yellow rating was introduced for minor non-compliances that do not harm the environment. The industry has responded positively to the traffic-light approach, which helps wineries target problem areas to achieve compliance.

Examples of Red (non-compliance) include one or more resource consent conditions or Plan rule not being complied with, such as:

- breaching discharge rates and volumes
- exceeding contaminant thresholds in wastewater
- failure to take and/or test soil or wastewater samples
- inadequate documentation to assess performance against consent conditions and plan rules.

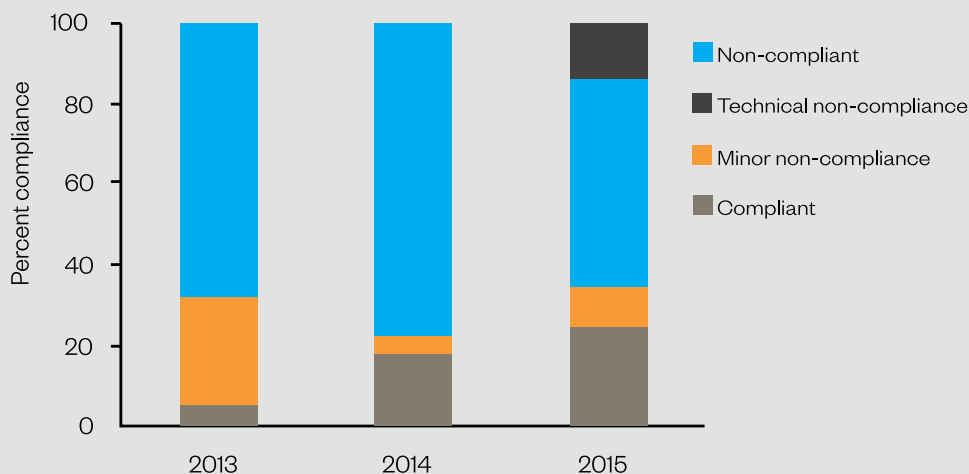


Figure 2: Levels of compliance for wineries in the Rural Zone, 2013-2015

Weather and record-keeping play a part in poor compliance results. Heavy rain during vintage in April 2014 created issues for some wineries, resulting in a low compliance rate. The smaller 2015 harvest produced less wastewater and dry weather before and during vintage also helped improve compliance. The relatively low level of compliance is mostly related to poor record-keeping about wastewater discharge. Record-keeping is improving after discussions between Council and winery staff.



#### WANT TO FIND OUT MORE?

- Scoping report on winery wastewater discharges, August 2015. CW Gray & S Laurenson, AgResearch.
- Winery wastewater irrigation - the effect of sodium and potassium on soil structure. Prepared for Marlborough District Council, May 2011. S Laurenson and D Houlbrooke. AgResearch.
- Determination of soil dispersion in response to changes in soil salinity under winery wastewater irrigation. Report prepared for Marlborough District Council. June 2012.
- Survey of soil properties at some sites receiving winery wastewater in Marlborough. MDC Technical Report No: 12-002. ISBN 978-1-927159-09-5.
- Review of guidelines for the management of winery wastewater and grape marc. Report prepared for Marlborough District Council, June 2012.

Historically there have been significant issues with ponding of wastewater during vintage. From 2012 to 2015 this improved, indicating that wastewater disposal is being better managed. Factors include increased disposal areas, changing the type of irrigation (e.g. from travelling irrigator to fixed sprinkler systems) and upgraded wastewater treatment systems with increased automation and alarm systems. However, poor record-keeping means some wineries are still assessed as Orange or Red.

Despite the 2013 and 2014 vintages processing more grapes than ever before the site inspections showed no significant adverse environmental effects from wastewater discharge. This was a good outcome as the 2014 vintage processed a record 329,572 tonnes. As production increases, a number of wineries have invested substantially in upgrading their wastewater treatments systems.

However, the situation is different for grape marc, which can be spread directly to land, fed to stock or made into compost. There have been significant issues with discharge, leachate collection and odour at one winery whose composting operation was



bringing in grape marc from other wineries. There have also been problems with grape marc being stored near waterways.

In 2015 there were no significant issues as grape marc volume was down and much drier than in the previous year.

## FUTURE RESPONSE

Council will continue to work with individual wineries and industry groups to ensure that discharges are well managed. This will include ongoing education about the need to comply with consent conditions and rules in the plan, and provide accurate records to Council to demonstrate compliance.

There will be an increased focus on grape marc and monitoring of sites where it is composted, stored or spread directly on to land.

A 2015 report on the impact of winery wastewater on soil health and water quality highlighted a number of potential gaps in data that the Council needs to address.

There are plans for broader monitoring to see if there is any long-term impact of winery wastewater on soil quality and groundwater across the region.



Storage of grape marc

## CASE STUDY:

### Matua Marlborough wastewater treatment

When Treasury Wine Estates bought the Matua Marlborough Winery in 2012 they planned to double production. First though, they had to sort out their wastewater treatment and disposal, which they admit had not been coping well.

Like most wineries Matua used a simple system that screened solids, balanced pH levels and then irrigated to land. However, issues with degrading pasture, soil eutrophication and odour required a better approach.

Subsequently, Matua Marlborough invested heavily in a biological system designed and manufactured by Factor UTB, an Australian engineering company.

Three large tanks (reactors) make up a two-stage process to remove solids and treat the winery wastewater. Millions of different bacteria occur naturally in winery waste, but it is up to the treatment plant to encourage the right sort of

bacteria and create an environment for them to grow and work at breaking down the effluent. This is controlled by several factors including pH levels, air flow and rate of sludge removal.

The treated water is piped out to irrigate a pine forestry block next to the Wairau River. Regular

checks are made through test bores and soil samples to ensure the system is working correctly.

Thanks to a combination of automation and dedicated day-to-day management by staff, Matua Marlborough has reduced the environmental impact of its wastewater by 80% while doubling production to 23,000 tonnes.

The wastewater treatment system was an entrant in the 2015 Cawthron Marlborough Environment Awards, supported by the Marlborough District Council. The awards judges stated it has set a benchmark in how wastewater can be managed in a rural setting. Now treating the waste at Matua Marlborough seemed as important as making the wine.



Matua Marlborough staff and Environment Awards judges discuss the reactor tanks which rely on bacteria to treat the effluent.

# FORESTRY

*Forestry is an important industry in Marlborough and a significant contributor to the local economy. However, forestry activities, especially harvesting, require careful management to reduce environmental impacts on sensitive waterways and estuaries.*

There are approximately 82,000 ha of planted forest in Marlborough. The forestry industry has grown from harvesting 750,000 m<sup>3</sup> logs in 2008 to more than 1 million m<sup>3</sup> in 2013. It provides approximately 456 full-time jobs, mainly in logging, forestry services and processing, while also providing added value to recreational opportunities in the district.

The greatest potential for adverse environmental effects occurs when a forest is harvested and earthworks are needed to build roads, tracks and skid sites. The felling of trees also exposes bare ground to the elements, making it more prone to erosion.

Good practice is essential to minimise harm to the environment. A resource consent is required for forestry-related land disturbance such as building roads. Harvesting is a permitted activity but must meet the environmental standards set out in the Council's Resource Management Plans.

## PRESSURES

Extreme weather and poor management present the biggest risks to the environment during forestry harvesting. Wilding pines that have spread from forest blocks are also a significant pressure, particularly in the Marlborough Sounds, Red Hills and South Marlborough.

Sediment entering streams, rivers and coastal environments from forestry harvesting is a threat to fish and other aquatic life. Sediment can smother the seabed and organisms living within it and muddy water affects fish spawning areas and food sources. There is also a risk of nutrients and contaminants washing into waterways.

## CHANGES SINCE THE 2008 SOE REPORT

- The Council now has a forest compliance monitoring programme with specialist staff. The number of blocks monitored varies each year depending on harvesting operations. For example, compliance staff undertook 61 monitoring inspections in 37 forestry blocks in 2014, compared with 21 blocks monitored in 2012.
- The number of inspections depends on the size and duration of the harvesting operation, with larger blocks receiving more visits. When possible, monitoring is scheduled towards the end of harvesting to ensure that the block is left in an acceptable state.
- Council has adopted new technologies such as drones and tablets to improve monitoring. All roading and tracking is logged with GPS and overlaid against consented harvest plans. Tablet software is used to record and photograph all skid sites used during harvesting. A skid site checklist on the tablet completes the monitoring report which can then be emailed straight to the forest manager or owner.
- Drones are used to capture video and still footage, providing an overview that is not possible on foot.
- The Council has produced a series of technical publications on the causes of erosion and sedimentation and the consequences for sensitive ecosystems, as well as best practice measures to help industry reduce environmental impacts.
- The work of the Marlborough Sounds Restoration Trust has been an important step in controlling wilding pines. Contractors funded by the Trust have killed wilding pines on thousands of hectares of regenerating native bush (see Biosecurity section).



Woody debris in creek bed



Sediment from forest harvesting washed into a river

Large amounts of woody debris and foliage falling into waterways can deplete the water of oxygen as this waste uses oxygen to decompose. Debris may also scour and erode riverbanks when washed downstream, destroying aquatic habitat. Valuable topsoil is lost through erosion and the poor soils left behind make future land use more difficult.

Storm events also create problems for forestry harvest sites, especially where trees were planted on steep slopes. A severe storm in December 2010 caused widespread slips on recently harvested blocks and triggered flows of logs and debris that damaged roads and property in Kaituna, Havelock and Canvastown. While the size of this 1-in-50-year storm was a factor, the intense and high rainfall (up to 44 mm per hour) and an earlier prolonged period of rain also contributed to the many slope failures.

There was another severe rainstorm in April 2014 as the tail end of Cyclone Ita swept through Marlborough. A beach in the outer Marlborough Sounds was covered in logs, debris and sediment that had washed off a nearby forestry block, despite the harvest area being constructed to the required standards. A nearby Council rain gauge recorded 182 mm over 24 hours, the highest rainfall for the area since records began 20 years earlier. The devastation caused by this storm highlighted the need to address the appropriateness of forestry on steep slopes in areas of highly erodible soils.

Conversion to pine forestry has been shown to change low flow yields and run-off from catchments.

Numerous studies have been carried out on New Zealand catchments and it has been shown that conversion from pasture to forestry can reduce mean annual runoff. Natural regeneration to scrub can also effect runoff, but to a lesser degree and over a longer time span. While the effects of pine conversion become significant at the time of canopy closure, which is about 10 years into a 30 year cycle, reversion to scrub or bush occurs gradually over time.

Increased traffic movements of large logging trucks during the forest harvest can damage roads and increase the maintenance required.

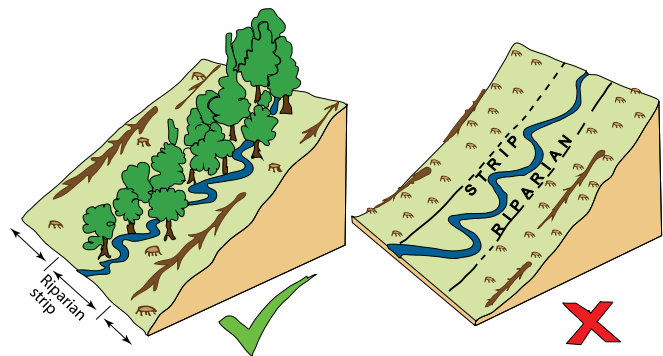


Figure 2: Riparian vegetation helps protect waterways by forming a barrier against sediment and woody debris (from Environmental Guidelines, forest harvesting, 2013).

## RESPONSE

The recent intense and localised storm events have led to a change in practices by some forest managers. Birdnests (piles of slash left over from harvesting) and fill material are now moved back from the edges of skid sites in an effort to limit skid failures.

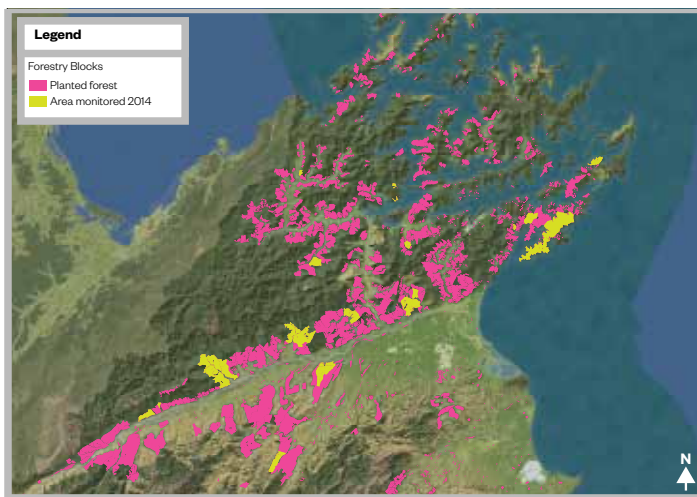


Figure 1: Forestry blocks in Marlborough.

The Council assessed the damage caused by the 2010 storm and published a report (See: Want to find out more?) and compliance monitoring was increased following this event.

Monitoring of forestry blocks includes:

- assessing harvest plans for log processing areas, road and track placement
- evaluating the effectiveness and installation of water controls such as culverts and water tables
- assessing the land stability of the area being harvested – eg. slash placement and benching around the log processing area
- assessing any stream blockages or the potential for blockages.

The Council has adopted a traffic light system to determine whether a forestry operation is complying with its resource consent conditions or permitted activity rules. Red is non-compliant and requires significant remedial action, Orange means minor corrective action is required; while Green is compliant and no action is needed.

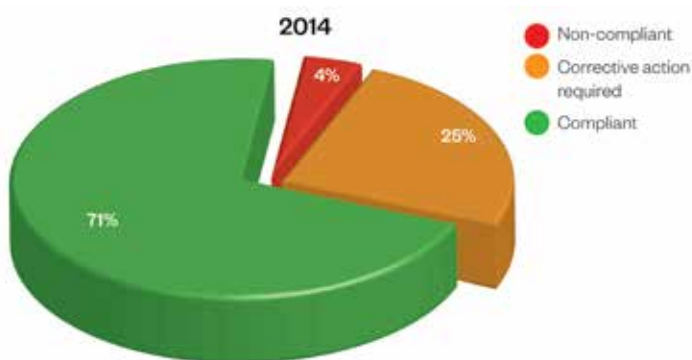


Figure 2: Level of forestry operation compliance in 2014

Orange status enables forest managers to take whatever action is required to fix the issues without being deemed non-compliant for relatively minor breaches.

Examples of corrective action taken at Orange sites in order to achieve Green status include:

- repairing tension cracks in road fill
- removing woody material from permanently flowing waterways
- pulling back birdnest material from the edges of log processing areas
- installing bunding to protect sensitive areas.

Examples of Red non-compliance include:

- unconsented roads and tracks
- lack of water controls
- severe tension cracking on road fill
- logging slash in a waterway
- harvest process fill in a waterway
- unconsented gravel extraction.

In 2013 the Council published an educational booklet setting out best practice environmental guidelines for forest harvesting operations. (See: Want to find out more?)

In 2014 Council staff introduced a harvest processing checklist to make it easier for the industry to comply with the Council's permitted activity standards and resource consent conditions.

## STATE

There has been some improvement in the rehabilitation of harvest processing areas in recent years, although this is not yet consistent across the industry. In 2014 about 70% of monitored processing areas were compliant.





## WANT TO FIND OUT MORE?

- Marlborough District Council. 2015. Mitigating fine sediment from forestry in coastal waters of the Marlborough Sounds. Technical Report No. 15-009. ISBN 978-1-927159-65-1
- Marlborough District Council. 2013. Environmental Guidelines: Forest Harvesting. ISBN 978-1-927159-29-3. [www.marlborough.govt.nz/Environment/Land/Forest-Harvesting.aspx](http://www.marlborough.govt.nz/Environment/Land/Forest-Harvesting.aspx).
- Marlborough District Council. 2011. Some Observations of Erosion as a Result of the 28 December 2010 Storm Event. Technical Publication No. 11-024. ISBN 978-1-927159-08-8. <http://www.marlborough.govt.nz/Environment/Land/Soils/Reports/Erosion-from-December-2010-Storm-Event.aspx>
- Ministry for the Environment. 2015. A Proposed National Environmental Standard for Plantation Forestry. EGI (13) 352. [www.mfe.govt.nz](http://www.mfe.govt.nz)
- Business and Economic Research Limited. 2008. The Economic Contribution of the Forest Industry to the Marlborough Region. Report to the Marlborough Forest Industry Association

It is now common practice to see well-benched skid sites with adequate drainage and birdnest material pulled back on to hard ground. Well-managed skid sites greatly reduce the risk of skid and slip failures, especially on the steep erosion-prone land of the Northbank and Te Hoiere / Pelorus River catchment where much of Marlborough's forestry takes place.

## FUTURE RESPONSES

The Council had started reviewing the forestry provisions for the Marlborough Resource Management Plan. However, this has been put on hold pending the introduction of the government's National Environmental Standard (NES) for plantation forestry.

The proposed NES was circulated for public consultation in June 2015. It aims to improve national consistency in local authority Resource Management Plan rules for plantation forestry and provide more certainty for those involved in managing these forests.



Drone footage of forestry machinery operating close to a waterway

# WASTE

*Waste affects our whole community. We all produce it and we all need to get rid of it somehow. While dumping to landfill will continue to be one of the solutions, the Marlborough District Council is committed to reducing the amount disposed in that way. The focus will be on reducing and reusing waste material.*

In 2013-2014 the region produced 55,343 tonnes of waste of which 15,300 tonnes (27%) was diverted from landfill by reuse and recycling. The majority of our waste (67%) comes from industry and this will be the next area to target.

## PRESSURE

Economics and legislation have the most effect on changing the way we deal with our waste - doing the right thing just for the sake of it has had limited success.



Reuse Centre

## CHANGES SINCE THE 2008 SOE REPORT

- Kerbside collections Blenheim and Picton (13,000 properties).
- Resource Centre established processing 4,500 tonnes pa.
- Reuse Centre established.
- E-waste and salvage yard established.
- Recycling facilities at all transfer stations.
- Rural community recycling containers established.
- Commercial industrial waste sorting facility now under construction.
- Landfill stage six operational.
- Landfill stage seven under construction.



Bluegums Landfill

Landfill disposal has been relatively cheap in the past, but that is no longer the case. Landfill sites are now highly engineered to protect the surrounding environment and this comes at a cost. The Waste Disposal Levy, introduced in 2009, placed a \$10 per tonne tax on disposal and landfill is now the least preferred option.

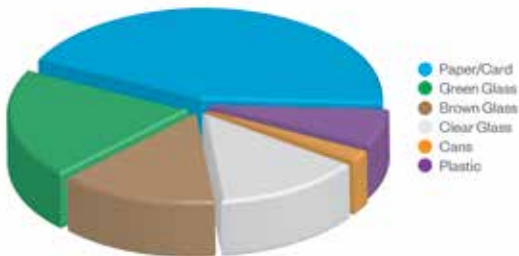
The Waste Minimisation Act 2008 requires councils to promote effective and efficient waste management and minimisation within their district, effectively legislating for us to reduce our reliance on landfill.

The New Zealand Waste Strategy sets out the government's priorities of reducing harmful waste and improving resource efficiency. Basically we need

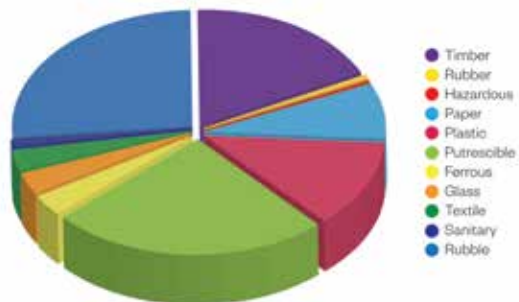
Table 1: Number of users, average volume and spend per transfer station for 2013-14

Location	Number of users	Refuse total (m <sup>3</sup> )	Refuse average per user (m <sup>3</sup> )	Average spend per user
Blenheim	96,887	19,105	0.2	\$5.72
Picton	17,949	10,689	0.6	\$17.27
Havelock	4,549	4,089	0.9	\$26.07
Rai Valley	1,197	1,217	1.0	\$29.47
Seddon	2,280	2,120	0.9	\$26.96
Wairau Valley	1,194	341	0.3	\$7.63
<b>Totals</b>	<b>124,056</b>	<b>37,561</b>	<b>0.3</b>	<b>\$8.77</b>

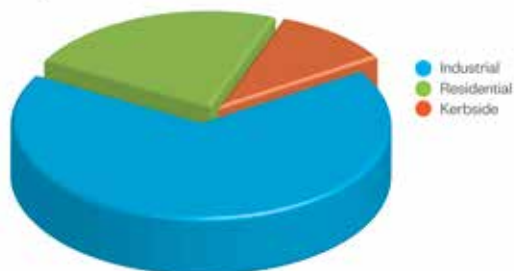
Tonnage outputs from Resource Recovery Centre 2013-14



What Makes Up Our Waste



Origin of Waste 2013-14



to stop throwing things away that could be reused or recycled.

The next major challenge for Marlborough is the amount of commercial and industrial material sent to landfill. The survey of waste received at the landfill indicates what could be reused or recycled if we had an appropriate sorting facility to separate the mixed materials.

Table 1 shows how much waste goes to transfer stations. Again, a large percentage of this could be diverted away from landfill if we had an appropriate sorting facility.

## RESPONSE

Planning is under way to build a Commercial Industrial Sorting Facility (CIF) on the Blenheim transfer station site and have it operating in 2016.

Since 2008 Council has invested heavily in domestic recycling collection and processing. This includes introducing kerbside recycling for Blenheim and Picton, establishing the resource recovery centre, re-use centre, e-waste collection facility and salvage yard in Blenheim and expanding recycling services to transfer stations in Havelock, Picton, Rai Valley, Seddon, Wairau Valley and Ward.

The Waste Minimisation Act 2008 requires the Council to have a Waste Management and Minimisation Plan (WMMP). Council developed its first WMMP in 2012. It was revised in 2015, with the following goals going through to 2021:

- establish a Commercial Industrial Sorting Facility (CIF) by July 2016



### WANT TO FIND OUT MORE?

- Marlborough Waste Management and Minimisation Plan:  
[www.marlborough.govt.nz/Services/Refuse/Waste-Management-Minimisation-Plan.aspx](http://www.marlborough.govt.nz/Services/Refuse/Waste-Management-Minimisation-Plan.aspx)

- investigate options to reduce food waste
- investigate options for co-mingled recycling (wheelie bins)
- investigate options to expand direct access to recycling
- investigate options to expand processing of green waste into compost.

## STATE

Council provides waste management and minimisation services to the community by contracting private companies through a tender process. The contracted services include: kerbside collection, transfer stations, regional landfill recycling and reuse centres, hazardous waste collection and composting.

Council also has a management plan for closed landfill sites that sets out monitoring requirements to ensure these sites do not have a negative impact on the surrounding environment.

## FUTURE RESPONSE

Marlborough has been very successful in turning itself into a recycling district. This has been achieved by the Council providing the appropriate infrastructure and the good response from the community. The next challenge is to do the same for commercial and industrial waste through the introduction of the Commercial and Industrial Waste Sorting Facility (CIF) proposed for the existing Blenheim transfer station.

The Council's targets up to 2021 are:

- have the CIF diverting 60% of waste by 2017
- increase the amount of recycling collected from Renwick, Grovetown, Spring Creek, Tua Marina, Rapaura and Rarangi by up to 400 tonnes per year
- reduce the food waste sent to landfill each year via kerbside collections by 20% (200 tonnes) by 2017
- increase the green waste processed through the Wither Road site each year by 10% (800 tonnes) by 2018.



Emptying the paper and cardboard for sorting



# CONTAMINATED LAND

*Like the rest of New Zealand, Marlborough generally has relatively low concentrations of contaminants in the environment. However, as a result of past industrial, domestic and agricultural activities there is still a small legacy of contaminated land in our region.*

A site is regarded as contaminated when the soil and/or groundwater has a significantly higher concentration of hazardous substances such as chemical sprays or toxic elements than normal and is likely to be a health risk for humans and the environment.

The most common contaminated sites are storage areas for fuel, chemicals and liquid waste. Other examples are former market gardens, orchards and service stations.

## PRESSURE

The Council is responsible for controlling discharges to the environment including contaminants to soil, air, groundwater or surface water.

A National Environmental Standard for assessing and managing soil contamination to protect human health was introduced in 2012. The Council requires landowners to identify and assess any land affected by contaminants before new developments, subdivisions, soil disturbance or land-use change can proceed. If necessary, the Council ensures that work is carried out to remedy or contain the contaminants to make the land safe for human use.

The Ministry for the Environment has compiled a list of the 53 activities and industries that are most likely to cause contamination because they typically use, store or dispose of hazardous substances. Examples on the Hazardous Activities and Industries List (HAIL) include sheep dips, pesticide storage, timber treatment, dry cleaners, commercial printers, wool

## CHANGES SINCE THE 2008 SOE REPORT

- The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health, introduced in 2012, was a significant move. It has provided a nationwide protocol for dealing with potentially contaminated sites. It gives Council staff better access to sites and ensures that land affected by contaminants is appropriately assessed before any development may go ahead.
- About 300 new sites have been added to the Council's Sites at Risk Register. A number of contaminated sites have been remediated as part of the requirements for development to proceed.



Inappropriate dumping causes contamination

processing, engineering workshops and fuel storage areas. (See: Want to find out more?)

## RESPONSE

Once a site has been identified as having been used for an activity or industry listed on the HAIL, it is added to the Council's Sites at Risk Register. This is an electronic database used by the Council to manage information about possible soil contamination at particular sites within the region. Council staff identify and add properties to the Sites at Risk Register on an ongoing basis.



Remediation of an old sheep dip site

When a contaminated site is identified as a potential risk, an investigation is conducted. If found to be a contaminated site, the landowner is required to manage the site to reduce or eliminate the risk.

Once on the Sites at Risk Register, each site is classified into one of six categories (Table 1).

The information on the Register is used by central government, environmental consultants and Council staff when assessing contaminants on land. The register is regularly used for Land Information Memorandum (LIM) and Project Information Memorandum (PIM) reports. These reports ensure that prospective buyers are aware of the potential presence of contaminants on a property.

## STATE

Until mid-2105 there were 589 sites on the Council's Sites at Risk Register. Of these, 352 were added when the database was created in 2007. Around 20 to



### WANT TO FIND OUT MORE?

- [www.marlborough.govt.nz/Environment/Land/Contaminated-Land.aspx](http://www.marlborough.govt.nz/Environment/Land/Contaminated-Land.aspx)
- [www.mfe.govt.nz/issues/managing-environmental-risks/contaminated-land/is-land-contaminated/hail.html](http://www.mfe.govt.nz/issues/managing-environmental-risks/contaminated-land/is-land-contaminated/hail.html)

30 new sites have been added each year, except in 2010 when 104 sites were identified after a review of fuel storage in Marlborough. Only 3% of the sites are classed as "contaminated". The majority (77%) are classed as "verified", which means its past or present use is on the HAIL. Being in the verified category does not mean the site is contaminated. Instead it indicates that hazardous substances have been used, stored or disposed of on the site at some stage so there is a potential for contamination.

Assessment of a property may involve:

- a preliminary site investigation: a desktop study and site visit to assess potential contaminants based on land use (historic and current), location and use of buildings, adjacent land use, aerial photos, property information and visible evidence and/or
- detailed site investigation: soil sampling and testing to confirm contaminant concentrations.

## FUTURE RESPONSE

New sites will be identified through reviews of historic information including aerial photos and property files and these will be added to the Sites at Risk Register. Updating this database is an ongoing process as new information becomes available. There are plans to put the register up on the Council's website using SmartMaps.

Future investigations will include historic orchards and market gardens, vehicle workshops and transport yards, gun clubs and rifle ranges.



Inappropriate dumping

Tale 1: Classification for sites held in the Sites at Risk Register

CLASSIFICATION	DESCRIPTION
Verified HAIL (history of hazardous activity or industry)	A site where a past or present use has been found on the Hazardous Activities and Industries List (HAIL). The Category I listing means hazardous substances have been used, stored or disposed of on the site and there may potentially be a risk of soil contamination.
Unverified HAIL	There is a possibility that hazardous substances have been used, stored or disposed of on the site and soil contamination may have occurred. The classification may follow reports from an external source or from a general information search carried out by the Council.
Contamination confirmed	A site where there is evidence of hazardous substances that are likely to harm humans or the environment. This category is for sites that the Council has information on, typically as a result of a site investigation.
Contamination acceptable, managed/ remediated	A site where there is clear evidence of residues of hazardous substances but the level of risk to human health or the environment is acceptable. The concentrations are low or action has been taken to reduce the risks.
No identified contamination	An investigation shows there are no contaminants at a higher level than background concentrations.
Entered on Sites at Risk Register in error	A site that has been classified under one of the other categories but was later found to be based on incorrect information. Investigation has found there is no contamination and the site had never been associated with a hazardous activity or industry. The site remains on the register but the mistake is recorded.

Old Sheep dips often contain areas of contaminated soil



# NATURAL HAZARDS

*Marlborough is exposed to a range of natural hazards because of our mixed climate, topography and geology. Flooding, landslides, earthquakes, storm surges, fire and drought have all been experienced in recent times. Some natural hazards such as flooding create localised risks, while others such as earthquakes can affect a much wider area.*

Under government legislation, Marlborough has three key organisations for dealing with natural hazards:

- Marlborough Kaikoura Rural Fire Authority (MKRFA) – set up by the Marlborough District Council, Kaikoura District Council and the Department of Conservation in 2012. The MKRFA manages volunteer rural fire forces, carries out fire prevention and education and co-ordinates crews and equipment to fight rural fires
- New Zealand Fire Service (NZFS) are responsible for fire safety, fire prevention and fire extinction in gazetted urban fire districts. The NZFS volunteer fire brigades also provide initial response into the rural areas to assist the MKRFA
- Civil Defence Emergency Management Group (CDEMG) – made up of the Marlborough District Council, Nelson Marlborough District Health Board, Police and Fire authorities for a coordinated approach. The CDEMG works to prepare communities to be self-sufficient and resilient in a natural disaster. It has a crew of trained volunteers ready to mobilise when an emergency event occurs.

## PRESSURE

### Fire

Marlborough has had several significant rural fires in recent years. The largest was on the Wither Hills on Boxing Day 2000 and burnt across 6,159 ha causing up to \$6 million damage. More recent events include the Flagg Bay, Te Wanganui / Port Underwood fire in December 2013 where a house and workshops were lost and the Onamalutu fire in February 2015, which

## CHANGES SINCE THE 2008 SOE REPORT

- Tsunami hazard maps completed by GNS show significant inundation including serious impacts on Sounds communities and townships.
- Liquefaction mapping on the lower Wairau Plain has been carried out.
- An earthquake near Seddon caused significant damage but response and recovery were commended.
- Increase in number and size of production forest fires.
- Rural fire now managed by one rural fire authority in Marlborough and Kaikoura.
- While 1998-2010 was flood-free, three events in 2010, 2011 and 2012 tested the protection works and caused significant damage in the Sounds and North Bank catchments.



burnt 600 hectares of forest and crops. These are all reminders that our climate, topography and land use pose significant fire hazards to people and property in Marlborough.

### Flood

Climate change is expected to bring higher intensity rainfall, more storm events and flooding. Risk of flood can be high, depending on the land use of the affected catchment.

Recently harvested forestry blocks on steep slopes can be prone to landslides, with debris being washed downstream. The December 2010 flood in the Te Hoiere / Pelorus catchment caused damage to property and closed SH6 in several places as the

intense rainfall triggered landslides on steep, recently logged slopes. A year later roads were washed out, houses seriously damaged and crops lost after a flood in the Ohinemahuta Valley (formerly known as the Onamalutu Valley).

## Earthquake

Marlborough sits on the Wairau, Awatere and Clarence faultlines that feed into the main Alpine Fault, making the district vulnerable to earthquakes. Two strong, shallow earthquakes centred near Seddon in 2013 caused significant damage in the Awatere and Flaxbourne areas. The first was in July at a magnitude 6.5 on the Richter scale. The second was in August, centred at Lake Grassmere and measured 6.6 at a depth of only 8 km. This caused significant damage to houses, farms and roading infrastructure.

## Tsunami

There have been eight tsunamis higher than 4 m in New Zealand since 1840, according to GNS Science,

and there is an ongoing risk of a tsunami along the Marlborough coast. Tsunamis are usually caused by earthquakes at sea or an undersea landslide. The Hikurangi trench off the east coast of Marlborough poses a risk of an undersea landslide triggering a tsunami.

## RESPONSE

### Fire

The Marlborough Kaikoura Rural Fire Authority has focused on improved training and resourcing for Volunteer Rural Fire Forces (VRFF) as well as wildfire education for property owners.

An integrated response by the NZFS and MKRFA saw 371 rural callouts in 2013-14, including 57 vegetation fires, 13 structure fires and 66 false alarms. Raising awareness about fire risk is a high priority in Marlborough with our dry conditions and the remoteness of many homes and baches. The key



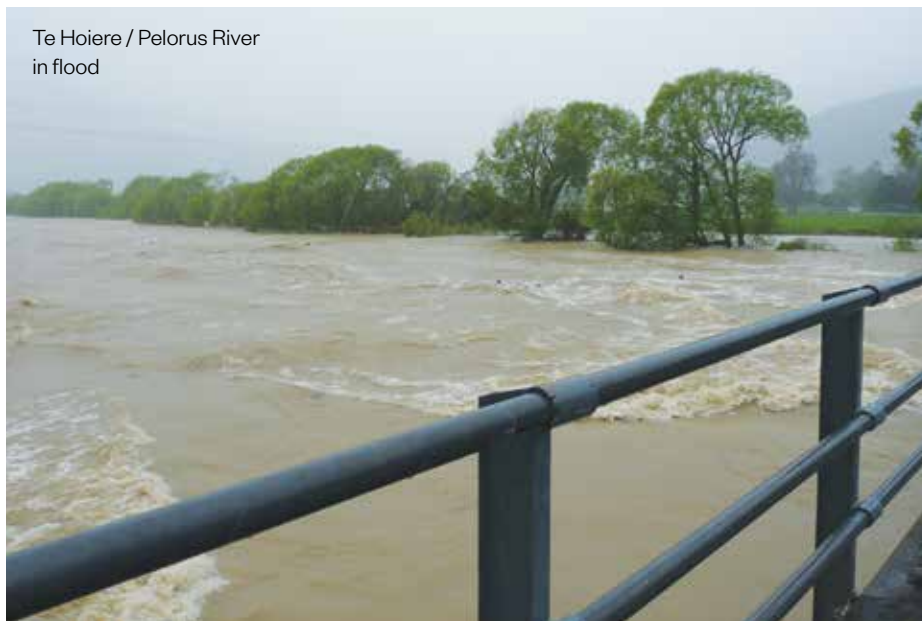
Cracked roads as a result of the Grassmere earthquake

education and prevention programme, Fire Smart, has been presented throughout the region including small communities at risk of wildfire and to those a long way from a fire service.

VRFF members and NZFS brigades have received thorough training to make sound and safe decisions to gain control of fires as soon as possible. Fire fighting resources such as fire trucks and water tankers have been upgraded and moved to where they are most needed. This has enabled the 18 VRFF to respond effectively in the event of a wildfire.

A wildfire threat analysis has been completed for the district. A strategic planning process is under way to provide fire managers with the necessary information to allocate appropriate resources before and during a wildfire.

Companies such as Marlborough Lines, Kiwirail and forestry contractors now have access to digital weather stations so they can plan and modify their activities according to the real-time fire risk.



## Flood

The Council has invested heavily in minimising the risk of flooding on the lower Wairau Plain since the devastating flood of July 1983. This flood was exceptional in that more than 300mm of rain fell in the catchments within 24 hours. On top of the rain, there was also snow melt.

All recent events in the Wairau, Omaka, Ōpaoa and Taylor Rivers have been contained and the protection works for these rivers is rated to cope with a one-in-100 year flood. As well as flood control, extensive drainage works have been carried out in Blenheim and in low-lying land to the east that is less than 3 m above sea level. In Picton flood control works for the Waitohi and Waikawa Streams are at a similar high standard.

River levels throughout the district are monitored and measured to provide early warning to residents who would be affected by potential flooding. Flood protection equipment and structures are regularly inspected and maintained. Two Emergency Planning Guides have been developed for the Wakamarina and Kenepuru area to help communities respond and get assistance in the event of future floods.

## Earthquake

Council staff were part of a large and co-ordinated response to the Seddon earthquakes in 2013, which caused extensive damage to houses, roads, water and sewer infrastructure. Council staff knocked on every door in the area to check on residents, find out what damage there was and give information on how to get help.

The Civil Defence Emergency Management Group (CDEMG), Marlborough Roads and the Council's Recovery and Welfare team worked with many other agencies including Marlborough Lines, Nelson Marlborough

District Health Board, Red Cross, Salvation Army, Police, NZFS, LandSAR, Rural Fire Forces, the Awatere Community Trust and the Flaxbourne Residents Association to ensure residents were safe and received the help they needed.

A Marlborough Emergency Response Team has been formed to provide a highly-trained initial response in times of disaster. The CDEMG has put a lot of effort into establishing welfare centres (usually schools and marae) and neighbourhood support groups so that communities are organised and able to look after themselves. CDEMG is also involved in promoting the national Shakeout exercise to raise awareness about what to do in an earthquake.



Earthquake damage SH1

Under the Building Act, the Council requires all non-residential buildings at risk in a moderate earthquake to be evaluated to see if they need strengthening.

An assessment of buildings at risk has been carried out and property owners notified of the need for any strengthening. The Council has also carried out a detailed seismic review of all its public buildings, covering structural and geotechnical issues.

## Tsunami

The Council contracted GNS Science to map the likely extent of inundation from a tsunami along the Marlborough coastline, including the Marlborough Sounds. Depending on where an earthquake was centred, the GNS model shows the most damaging sort of tsunami could take anything between 30 minutes and three hours to reach land.

Education and awareness programmes to prepare communities for an earthquake also apply in the event of a tsunami.

## Marlborough Engineering Lifelines Group

Our water, sewerage, stormwater, power, roads and telecommunication systems are all vulnerable to natural hazards including earthquakes, fire and flooding. The Marlborough Engineering Lifelines Group identifies critical “hotspots” where many services may come together, such as at a highway bridge, and develops ways to reduce the risk of failure. These include relocating utilities, engineering solutions to keep utilities operating and ensuring that services can be restored as soon as possible.

## Planning

In 2011 the Marlborough CDEMG completed an Emergency Management Group Plan. This included an assessment and risk profile of natural hazards in Marlborough and set priorities for further work. The plan focuses on Reduction, Readiness, Response and Recovery strategies that aim to reduce the likelihood and consequence of natural hazards on our communities.

## STATE

It is estimated that natural events cost New Zealand up to 1% of GDP each year. Trying to reduce those losses makes sense for the community and the economy.

In late 2014, Marlborough CDEMG was the subject of a Ministry of Civil Defence Capability Assessment Report. This found a significant improvement from the previous report but also identified areas that need further work including monitoring, plan development and placing more emphasis on welfare and lifelines (roads, water supply, power supply and communications).

Climate change is expected to bring regular droughts to Marlborough, which has a direct impact on the size and spread of wildfires in the region. El Nino weather patterns can now be predicted with some accuracy, allowing fire authorities to plan and prepare for more extreme fire seasons (usually October-March).



### WANT TO FIND OUT MORE?

- [www.marlborough.govt.nz/Environment/Natural-Hazards.aspx](http://www.marlborough.govt.nz/Environment/Natural-Hazards.aspx)
- [www.mkrfa.com](http://www.mkrfa.com) has reports on major fires, safety and fire prevention information and links to 11 remote automatic weather stations
- [www.marlborough.govt.nz/Services/Emergency-Management.aspx](http://www.marlborough.govt.nz/Services/Emergency-Management.aspx)
- [www.marlborough.govt.nz/Services/Emergency-Management/Civil-Defence/CDEMG-Group-Plan-2011-2016.aspx](http://www.marlborough.govt.nz/Services/Emergency-Management/Civil-Defence/CDEMG-Group-Plan-2011-2016.aspx)
- [www.civildefence.govt.nz/](http://www.civildefence.govt.nz/) For national information on natural hazards and what to do if there is an emergency

A wildfire threat analysis has highlighted which communities and areas of high biodiversity would be most at risk.

As well as the cost of firefighting there is the loss of productive forestry and farm land; For example, the estimated crop loss for the Onamalutu fire was \$2.6 million. Firefighting in Marlborough in 2014-2015 cost \$2 million.

Damage caused by flooding is directly related to the level of river protection work in place. The lower Wairau River protection works have kept flood waters contained in recent times with stock only having to be moved off river beds and minor road closures. However, the Te Hoiere / Pelorus and Wakamarina rivers do not have much protection, which can cause houses to be flooded, residents evacuated and State Highway 6 to be closed.

The GNS Science tsunami mapping shows that Marlborough is vulnerable to near-source tsunami which have the potential to be catastrophic. For the first time the mapping shows that the Marlborough Sounds are not as protected as previously believed and the risk to communities such as Picton and Havelock is the same as Rarangi and the exposed east coast.

## FUTURE RESPONSE

The Marlborough Kaikoura Rural Fire Authority will continue to work on fire management planning for the Sounds and Kaikoura coastal areas over the next three years. Legislative changes may mean that the

Rural and urban fire authorities will be integrated into one service in 2017. This will also involve input from forestry companies and the Department of Conservation. Forestry research organisation SCION will help determine when activities should be shut down due to fire risk. These include track closures (e.g. Queen Charlotte track), road closures (e.g. Molesworth Road), Kiwirail track maintenance (e.g. track cutting/welding) and forest harvesting operations.

Education and awareness programmes such as Fire Smart will continue and VRFF will work with their communities to reduce risks.

Maintenance will be kept up on flood control infrastructure and pumping equipment.

The Marlborough CDEMG intends to develop a plan to put in place the recommendations of the 2014 Capability Assessment Report and also review the 2011-2016 Emergency Management Group Plan. This will involve a complete review of Marlborough's risk profile.

Community organisations including Neighbourhood Support, local schools and marae will be supported to ensure that the 13 welfare centres remain ready to operate if needed.

Council and the CDEMG will work with the communities most at risk from a tsunami to develop evacuation plans, signage and safe zones for each area.



Onamalutu fire threatens homes



## CASE STUDY: Response to Seddon Earthquake

When the earthquake struck on Friday August 16, 2013, all of Marlborough shook, but it soon became clear that the worst hit areas were Seddon, Grassmere and Ward.

The quake measured 6.6 on the Richter scale, was centred at Grassmere and was shallow, just 8 km below the Earth's surface.

The power went out, roads were buckled and reports came in that virtually every house in the Seddon and Ward areas had sustained some damage. The Council's Civil Defence Emergency Management Group (CDEMG) swung into action, working from the operations centre in Wither Road.



Toppled chimney as a result of the Seddon earthquake

The CDEMG co-ordinated many agencies in response to the disaster, including Police, LandSar, Fire Forces and welfare teams.

Marlborough Lines staff worked quickly to restore much of the power. Fire crew responded to many calls to deal with collapsed chimneys, board up broken windows and secure houses. Council contractors restored water supplies where they could and roading contractors did the same for vehicle access.

Council staff knocked on every door in the area to check residents and assess the extent of the damage. Some houses were no longer habitable and others had been abandoned. Broken water pipes and ruptured hot water cylinders contributed to the mess of emptied cupboards and fridges. Chimneys had fallen through roofs and heavy rain over the weekend added to the misery.



Damage from Grassmere earthquake

Seddon School was turned into a Red Cross Welfare Centre, with the Salvation Army providing food for families staying overnight or gathering for support.

Many other agencies, churches and supporters offered to help and provide goods and services to the affected communities. The Council co-ordinated all of these offers through the Customer Services Centre. A Mayoral Earthquake Fund was also set up to receive donations. The Awatere Community Trust and the Flaxbourne

Residents Association stepped up, using their various networks to provide help at the time of the earthquake and in the following weeks and months. The Council also continued to co-ordinate welfare and recovery efforts, including liaising with central government departments to help get Seddon back on its feet.



Emergency Management Group (evening of Grassmere earthquake)

Since the 2013 earthquake, the CDEMG has focused on working with communities throughout the region to set up their own Civil Defence sectors. As well as developing a plan for their local community, every household is encouraged to be prepared with food, water and an emergency kit in case of flood, fire, earthquake or tsunami.

## FLOODING AND EROSION ON THE WAIRAU PLAIN

The 20,000 ha Wairau floodplain downstream of the Wairau/Waihopai confluence was created by the Wairau River. The plain has been built up by the river eroding its banks and flooding across the area, spreading gravels and sediment to lay the foundation for our farming and horticulture industry. The same processes that formed the plain now threatens, with the river eroding its banks, moving its position and flooding spreading sediment across productive land.

Flood and erosion control work has been carried out since the earliest days of European settlement in an effort to contain the Wairau and waterways on the southern plain including the Ōpaoa, Taylor, Omaka and Fairhall rivers, Doctors Creek, Ruakanakana Creek and Riverlands Co-op Floodway. Blenheim, Renwick and the Riverlands Industrial estate are particularly sensitive to flooding from these southern rivers.

Stopbanks, gravel extraction, channel excavation, bank protection, the Taylor Dam and the Wairau Diversion are all designed to control flooding at a standard that would cope with a one-in-100-year flood. Ongoing protection and maintenance work is essential to ensure that people and property are kept safe during flood events.

### Pressure

Low river levels, fewer large floods and the effect of the Wairau Diversion have led to a build up of silt in the Lower Wairau River (below Tuamarina Bridge). This reduces the efficiency of the river and has an additional effect at the mouth of the Wairau, with water backing up the river.



Wairau River erodible bank overtopping



Extending the Wairau River mouth guide bank

Every time it floods, damage and erosion occurs along the riverbanks and needs to be repaired to ensure the flood protection measures remain effective. Large-scale gravel extraction in the Wairau has helped increase the capacity of the waterway but has also lowered the river bed in some places causing the banks to be undermined. This can require expensive repair and protection work.

Floods in the mid-1990s raised concerns about whether the Taylor River, which runs through Blenheim, would be able to cope with a large flood if its flow was impeded by floodwater backing up in the Lower Ōpaoa. The Taylor River and its floodway are valued for ecological, amenity, recreational and flood management purposes. Finding a balance so that all these values can be protected requires input from all sectors of the community.

As urban and industrial areas expand there is a need to increase stormwater discharges. This puts pressure on existing drainage resources such as the Riverlands Co-op Floodway and Ruakanakana Creek (Renwick).

The extensive expansion of vineyards has included land contouring and planting on dried-up streambeds in the southern valleys. Some of these vineyards were damaged by erosion and flooding between 2008 and 2014, prompting some landowners to seek more flood control work from the Council. The low-lying basin in the Battys Road/Bells Road area southwest of Blenheim is subject to flooding from Doctors Creek.

A lack of floods between 1998 and 2008 gave new landowners in the area a false sense of security and they were surprised by the impact of the 2008 floods.

Throughout Marlborough the public wants more certainty about their safety and the safety of their property in times of flood. Early warnings are needed to allow people, stock and machinery to be evacuated. The public also seeks reassurance that flooding can be managed, especially with the prediction of increased storm events associated with climate change.



Doctors Creek at Battys Road, August 2008

## Response

To deal with siltation in the Lower Wairau, an erodible gravel embankment was built at Tua Marina in 2009 to direct the majority of flow away from the Diversion and into the lower river towards the Wairau Bar. Having more water in the river channel increases the scouring flows during small floods. In large floods the gravel embankment is eroded away to share the flows between the Diversion and the Lower Wairau. The erodible embankment has been breached and reinstated 12 times since it was built.

Also in 2009, the guidebank at the Wairau Bar was extended 120 m with heavy rock, forcing a direct outlet to the sea. The outlet is now working more efficiently, especially at low tides, with full tidal outflow of the lower river.

Damage and erosion of the riverbanks is being managed with regular rock work for bank protection and maintenance of willows planted to stabilise the banks. Stopbanks along the Lower Wairau are being raised and strengthened in various locations to provide a consistent level of protection on both sides of the river. The Council's quarry at Pukaka provides a guaranteed supply of large rocks for repair and protection work.

There has been growing demand for Wairau River gravel in the past 20 years, with gravel extraction exceeding supply from the river by 2.5 million cubic metres. In 2005 the Council adopted a Gravel Management Plan, which is reviewed every four years. The plan limits gravel extraction from areas where the river bed has been lowered by more than

1 m since 1991 and encourages gravel extraction in places that benefit river control. The 2012 review reduced the allowable gravel extraction to 135,000 m<sup>3</sup> per year from this reach of the Wairau, reducing by another 10% per year until the next riverbed survey and review in 2016.

Work to improve the flow of the Ōpaoa when in flood included removing willows and reshaping the berms at some of the sharper bends. The 2008 flood confirmed the success of this approach and as a result the Taylor Floodway also had more capacity than required, which is reassuring in the face of climate change uncertainties. No further upgrading is expected in the foreseeable future.

The Taylor River Floodway Reserve Management Plan identifies locations for ecological planting, cycleways and walking tracks that fit with the need for flood control. Joint projects between the Council, schools and community groups have seen new plantings and tracks in the area, which is used and enjoyed by more and more people.

Flood control work has also continued in other catchments. The channel of the Riverlands Co-op Floodway has been enlarged and stopbanks improved, but further work would be difficult and costly. It is recommended that no additional stormwater be added to this system.

Some work has been done to improve the hydraulic efficiency of Doctors Creek, but little more can be achieved to reduce the risk of flooding. Hazard mapping based on the 2008 flood will be used to advise what would be appropriate for future development on the low-lying land south-east of Blenheim.

The Council has given advice to vineyard owners in the Southern Valleys about protecting their land from further riverbank erosion; however, landowners are responsible for the cost of any work done.

In response to growing concern about climate change, the Council will continue to investigate additional river control and flood protection where it is practical and does not alter the ecological integrity of

the waterway. Improved communication and early warnings are also a priority. Floodwatch, the Council's online flood warning system, displays current rainfall, river flows and flow predictions. Graphs also show the levels at which the flood flows would overtop the banks, close roads and endanger people and property. This advance warning allows Civil Defence, farmers and residents to track the severity of a flood and prepare to evacuate if necessary.

The Council has prepared flood hazard maps for all of Marlborough that show where land development may be restricted by the risk of flooding. The maps will be published in the new Marlborough Resource Management Plan and updated as more information comes to hand.

## State

Council carry out surveys and monitoring to evaluate improvements to flooding and erosion works and identify any new areas of concern on the Wairau Plain.

A 2013 survey showed the Lower Wairau River had scoured 250,000 cubic metres of silt since 2010, reducing the riverbed and flood levels by 300 mm. Surveys are carried out every four years to track changes in the level of the riverbed, including the build-up of silt which reduces the flooding capacity. The amount of gravel being extracted from the river is also monitored.

River channel performance is observed during flood events, including during three large Wairau floods

in 2010, 2011 and 2012. The main Wairau flood protection works performed as designed, although bank erosion protection works were required. The 12 years from 1998 to 2010 had been virtually flood-free, so the floods since then have been a good test of the changes made to the floodway since 1998.



Taylor flood in Blenheim, August 2008

The July 2008 flood in the Taylor River was the largest since 1966. Monitoring and analysis of this flood showed the Lower Ōpaoa berm-shaping work had been very effective. The floodway capacity is now 20% greater than Council's benchmark of a one-in-100-year flood.

The Riverlands Co-op Floodway may not be up to the same standard, with flood levels also influenced by high tides and estuary levels from Wairau and Ōpaoa flooding. After some improvements to the floodway, monitoring of the May 2013 event indicated lower flood levels. Further analysis is desirable.

Computer modelling of the hydraulics of Ruakanakana Creek north of Renwick is being carried out to help improve our understanding of the capacity of this waterway.

## FLOODING AND EROSION – PICTON, WAIKAWA, THE SOUNDS AND AWATERE

Beyond the Wairau Plain a number of rural rivers and streams flow through towns and small communities, carrying the risk of flooding and erosion. These include the Waitohi River and Kent Street Drain in Picton, the Waikawa River, the Wakamarina River at Canvastown, streams in Havelock, Okiwi Bay and other Sounds' communities and Starborough Creek in Seddon.

Under earlier Catchment Board legislation, these waterways did not have comprehensive flood control schemes and instead relied on ad hoc measures by individual councils. The Marlborough District Council took over responsibility in 1992 and the floods of 2004, 2008 and 2010 demonstrated the hazard posed by many of these streams.

With its wide river bed and high terraces, the Awatere River is not a considered flood hazard.

### Pressure

Following several floods since 1998, concerned landowners in Picton, Waikawa and Seddon have sought flood control work from the Council. However, there is limited funding available for this.

The Waitohi River flood hazard in Picton has been created by the constriction of the large triple culvert that was built under the wharves in 1970 to allow port development. This undersized culvert is very expensive to upgrade.

Channel capacity is also an issue for the lower Waikawa River which was enlarged in 1986 for the marina development and township expansion but was not made big enough.

Starborough Creek is down-cutting as it flows through Seddon, which causes banks to collapse from time to time.

### Response

To improve the flood flows of the Waitohi, a smooth transition inlet to the triple culvert has been constructed. This improves the capacity by about 8%. However, there is no funding available to achieve a further 20%, which is the desired solution.

Improvements including a new road bridge have been made to Kent Street Drain in Picton. There will be no further upgrades because of the high cost.

The lower Waikawa Stream has been upgraded to cope with a one-in-100-year flood. This included buying the stream channel that was on private property.

Some works have been carried out in the Wakamarina to provide more protection for Canvastown, as well as work on the Okiwi Bay and Havelock streams. However, none of these meets the one-in-100-year flood standard.

Bank protection works are not effective on Starborough Creek in Seddon. The best solution is for the Council to prevent development close to the riverbanks.

The publication of flood hazard maps with associated controls on future development will be the main method of flood management for these towns and rural communities.



Waikawa River flooding 2004



### WANT TO FIND OUT MORE?

- Rivers and Land Drainage Asset Management Plan 2015:
- Taylor River Floodway Reserve Management Plan:  
[www.marlborough.govt.nz/Council-Publications/Plans-Policies-and-Documents/-/media/Files/MDC/Home/Recreation/Management%20Plans/TaylorRiverManagementPlan.pdf](http://www.marlborough.govt.nz/Council-Publications/Plans-Policies-and-Documents/-/media/Files/MDC/Home/Recreation/Management%20Plans/TaylorRiverManagementPlan.pdf)
- Floodwatch river and rainfall alerts online:  
[hydro.marlborough.govt.nz/floodwatch/](http://hydro.marlborough.govt.nz/floodwatch/)

# URBAN GROWTH

*Marlborough's growing population has increased the demand for housing and with that comes the need for more infrastructure such as roads, water and sewerage.*

Since the 2008 State of the Environment Report the Council has completed its Growing Marlborough strategy to guide investment and development for the next two decades. Community workshops and submissions were an important part of developing the strategy, which provides a framework for urban growth while considering the environment, landscape and social needs.

After a period of strong economic growth in Marlborough the 2008 global financial crisis had a noticeable impact on development. There was a significant drop in the number of residential lots being proposed until confidence started to improve in 2012.

## PRESSURE

Much of the available residential zoned land within Blenheim has been developed, including the Council-led Boulevard on Taylor, and there is pressure to find more land for building. Council was considering the Riverlands area east of Blenheim when the Christchurch earthquakes caused a rethink. Areas previously thought suitable for new housing development were no longer appropriate because of concerns about ground stability and liquefaction.

Larger residential lots are being subdivided to create infill housing in suburbs. This can change the feel of an area and put demands on existing infrastructure.

There are concerns about who should pay for infrastructure upgrades (e.g. roading, water, sewerage and stormwater) to cater for new allotments created by subdivision. The Resource Management Act requires financial contributions from developers as part of the resource consent process for subdividing, but it is up to the Council to decide the most equitable use of that money. (See Want to find out more?)

## CHANGES SINCE THE 2008 SOE REPORT

- Strong urban growth in Blenheim has led to a shortage of residential zoned land.
- 170 ha of land has been rezoned to cater for future urban growth.
- A Development Contributions Policy has been introduced to better manage costs of servicing urban growth.

Smaller towns and settlements around Marlborough are also experiencing growth and additional land is needed to accommodate that.

## RESPONSE

### Housing supply

Council started its Growing Marlborough Strategy in 2006, with the work divided into three areas covering Blenheim, Southern Marlborough and Northern Marlborough. These projects set out to provide a planning perspective for urban growth for 25 years from 2006 to 2031. The finalised Growing Marlborough Strategy was adopted by Council in 2013.

Also in 2013, the council started a more urgent Plan Change process to extend the Blenheim residential zone into areas that would not be so prone to liquefaction. This review identified that 171 ha in Springlands and Westwood, (north and the west of Blenheim) would be suitable for housing.

This re-zoning was approved in October 2014. However developing the land depends on upgrades and improvements to infrastructure such as sewer and stormwater. Development is expected to progress site by site, but only after the necessary infrastructure is in place.

South-west of Blenheim a private Plan Change was granted by the Environment Court in December 2014 to convert Colonial Vineyard into housing land. This has provided a further 21.4 ha on the corner of Battys Road and New Renwick Road as a residential zone.

## Liquefaction

The recent earthquakes that occurred in Christchurch in 2011 and Seddon in 2013 reminded the community of the risks associated with seismic activity and the consequences of liquefaction. Liquefaction occurs when the strength and stiffness of a soil is reduced by earthquake shaking. This causes vertical settlement by ejecting sediment and when proximate to waterways, causes lateral spread. A key factor is the combination of fine grained soils and shallow water tables.

In Marlborough the soils of the lower Wairau Valley were recognised as being seismically sensitive, though there was no specific broad scale investigation until 2012 when the Council completed an Urban Growth Study on land east of the Blenheim urban area. This prompted the Stage Two investigation to the north and west of Blenheim in 2013. Together these reports provided a broad appreciation of the urban development constraints.

## Development contributions

In 2009 Council introduced its Development Contributions Policy under the Local Government Act 2002. Development contributions are a charge levied on a developer to recover some of the money spent by the Council to provide infrastructure services. Development contributions can include a transfer of land (for example, to create a reserve).

The Development Contributions Policy is part of the Council's Long-Term Plan and must be reviewed every three years. When the Council reviewed the policy in 2012, it decided to keep contributions at the level set in 2009 to encourage growth.

## FUTURE RESPONSE

Under the Growing Marlborough Strategy, the Council also studied potential urban growth in settlements including Renwick, Picton and Seddon. These areas are not under the same expansion pressure as Blenheim, but their urban boundaries have been reviewed as part of Marlborough's new Resource Management Plan.

**i** WANT TO FIND OUT MORE?  
2015-25 Long-Term Plan, including information on the Development Contributions to be paid by developers at time of subdivision.



## STATE

Blenheim is now well-placed to provide more new housing after 170 ha of land was designated for residential development. This should enable the town to grow at a sustainable rate and accommodate any gradual increase in population.

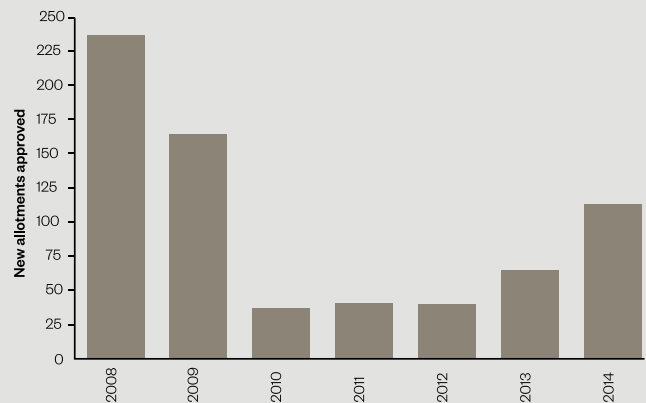


Figure 1: New allotments approved in Blenheim 2008-2014

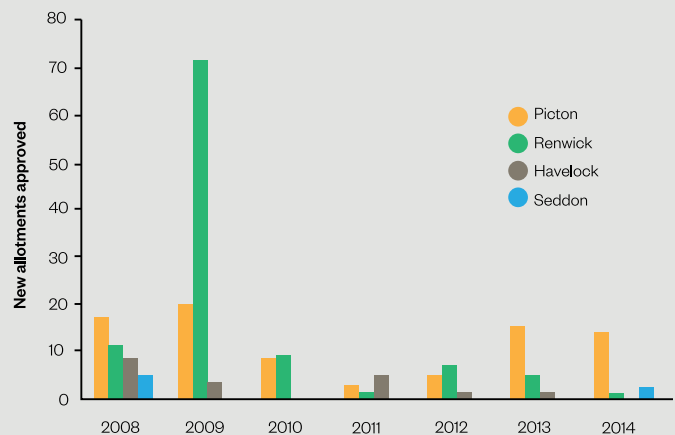


Figure 2: Allotments created in Blenheim

# NOISE

*Excessive or unreasonable noise can have a drastic impact on our quality of life and our enjoyment of where we live. Background noise varies from location to location, ranging from wind and ocean waves in exposed coastal spaces to traffic and construction noise in urban areas.*

What is perceived as negative or unreasonable noise varies from person to person. However, it can generally be defined as unwanted sound. The nuisance value from sound is a combination of how loud it is, how long it continues, and whether it is all the time, intermittent or one-off. The time of day also plays a part in how noise is perceived, with night-time noise often seeming twice as loud as the same sound during the day.

The importance of managing noise levels is reflected in the Council's objectives in the urban and rural chapters of the Resource Management Plans. These objectives aim to avoid, remedy and mitigate the adverse effects of unreasonable noise, while allowing for reasonable noise associated with port activities.

## PRESSURES

More people living closer together can lead to an increase in noise complaints. Infill housing and

## CHANGES SINCE THE 2008 SOE REPORT

- Numbers of complaints regarding noise have remained relatively constant since 2008.
- Council receives around 1200 complaints about noise each year.
- Council receives complaints regarding noise from a variety of sources including people, stereos, vehicles, machinery and agricultural equipment.
- The vast majority of noise complaints received relate to loud stereos in urban areas.

expanding urban areas may not necessarily lead to increased noise levels, but people may become less tolerant of noise. For example, people already living with a lot of neighbours may tolerate a loud stereo next door, while someone who has just moved into infill housing may not.

City dwellers may have more tolerance for noise than people from rural or rural residential areas but living within a more compact town requires people to be more sensitive to the needs of others especially in relation to noise.

Increased traffic due to increased development, housing, shopping centres and schools can lead to an increase in background noise, as can any work associated with the construction and maintenance of buildings and roads.

Frost fan





Land uses such as airports, construction sites and vineyards can have a negative impact on ambient noise levels for those who live nearby. For example, vineyards have now been planted close to Blenheim and small settlements on the Wairau and Awatere Plains and growers often use noise devices such as gas guns to scare birds away from eating the grapes and frost fans or helicopters to protect vines from early or late frosts. This can cause unreasonable and excessive noise for residents living nearby. The situation is aggravated in areas recently converted to grapes from other land uses such as pastoral farming.

## RESPONSE

Council keeps a record of all noise complaints and acts on each one. Complaints can be made 24 hours a day, seven days a week and inspectors follow up at all hours of the day or night. Noise complaints are assessed as follows:

- excessive, requiring a written warning
- excessive, requiring seizing of equipment
- excessive, not requiring seizing of equipment
- non-excessive
- non-excessive but requiring a verbal warning
- no excessive or unreasonable noise noticed on inspection of the property
- unable to locate the property/location of the noise complaint
- unreasonable noise.

Noise complaints are placed in one of the following categories when recorded by the Council:

- bird bangers
- frost fans
- machinery
- person
- stereo
- vehicle
- other.



### WANT TO FIND OUT MORE?

- [www.marlborough.govt.nz/Your-Council/RMA/Wairau-Awatere-Resource-Management-Plan/Plan-Changes/PO58-Frost-Fans.aspx](http://www.marlborough.govt.nz/Your-Council/RMA/Wairau-Awatere-Resource-Management-Plan/Plan-Changes/PO58-Frost-Fans.aspx)
- Marlborough District Council  
P: 03 520 7400  
[www.marlborough.govt.nz/noise](http://www.marlborough.govt.nz/noise)

## STATE

Noise complaints increased from 2008 to 2011 and decreased again from 2012 to 2014 (Figure 1).

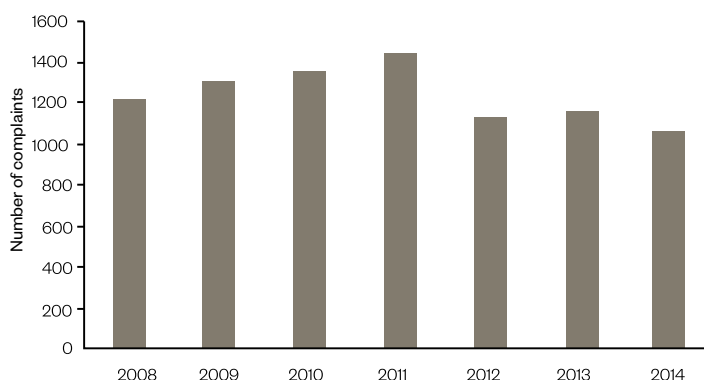


Figure 1: Noise complaints received by the Council

Of these, the majority were classed as non-excessive but received verbal warnings. The next most common assessment was for no noise, i.e. the inspector found no noise (either excessive or unreasonable) on arrival.

In the most serious cases, written warnings are given and equipment is seized decreased from 2008 to 2014.

Loud stereos dominate the complaints. As with the total number of complaints received, those about stereo noise increased from 2008 to 2011 and dropped from 2012 to 2014.

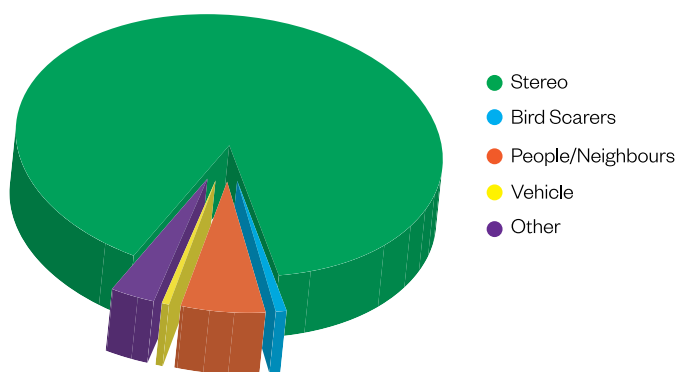


Figure 2: Types of noise complaints received by Council in 2014

## FUTURE RESPONSE

The Council is taking a zero tolerance approach to bird bangers that break the rules. On a broader scale, Council are looking to improve public awareness about policies and issues relating to noise concerns.

## CASE STUDY

### Frost fans

Marlborough's winegrowing industry has expanded rapidly since 2001 with vineyards being planted across a wider range of land. This resulted in grapes being planted on land that has a higher chance of being frosted. Frost fans are used to protect grapes by mixing the cold air at ground level (which causes the frost) with warmer air higher up. Frost fans are needed when the buds are opening and new shoots are growing (spring) when the fruit is close to being harvested (autumn).

Serious frosts in the spring of 2003 affected grape yields severely and prompted an increase in frost fan use. Noise complaints about frost fans peaked in 2009 when nearly 1000 frost fans were used in Marlborough. Frost fans were historically allowed as a permitted activity in the Marlborough Resource Management Plans, subject to meeting certain standards. However, after ongoing complaints about the noise from the machines running at night, a Plan Change was proposed in 2009.

A significant amount of research, investigation and consultation with the industry was undertaken over the next five years. This led to a 2014 Plan Change to address the noise issues and changed the status of frost fans from a permitted activity to a controlled activity and included tougher noise standards. It also requires new houses being built near existing frost fans to have sound insulation. Since then, the number of frost fan complaints received by the Council has drastically reduced and there were no complaints in 2013-14 (Figure 3).

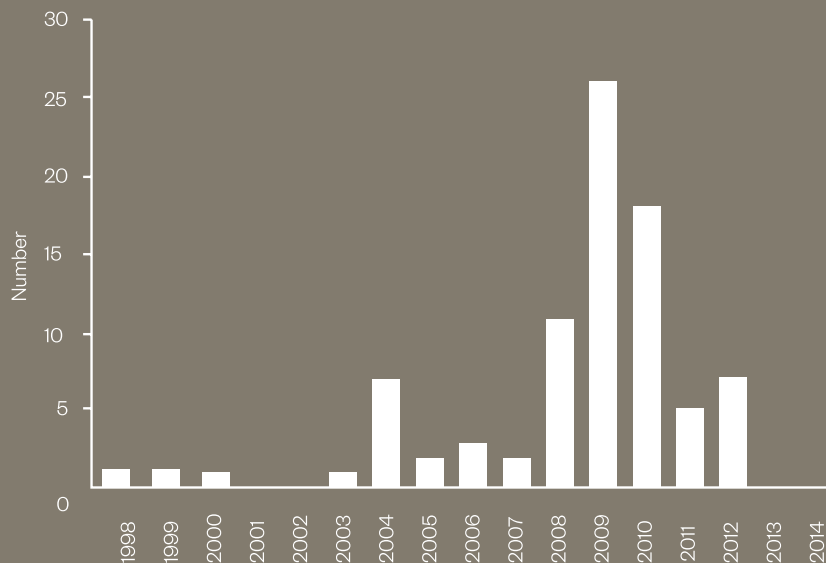


Figure 3: Number of noise complaints received by the Council about frost fans/helicopters

