COASTAL

MARLBOROUGH DISTRICT COUNCIL

From the sheltered bays of the Marlborough Sounds to the exposed beaches of the East Coast, Marlborough has around 1,800 km of coastline that many people enjoy for recreation or rely on for a living.

Looking after the coastal area is a complicated task with competing interests that must be managed and balanced. Tourism, aquaculture, fishing, mahinga kai (customary food gathering) and recreation all depend on healthy coastal ecosystems and good water quality.

Marine and land activities such as farming, forestry and sewage discharge all have a direct impact on the coastal environment. Council regulates the different activities in the coastal area through the Resource Management Plan and consenting process.

This work is backed up by research and monitoring to help understand the effects on the coastal environment of land and water use and provide good information for future planning and protection.

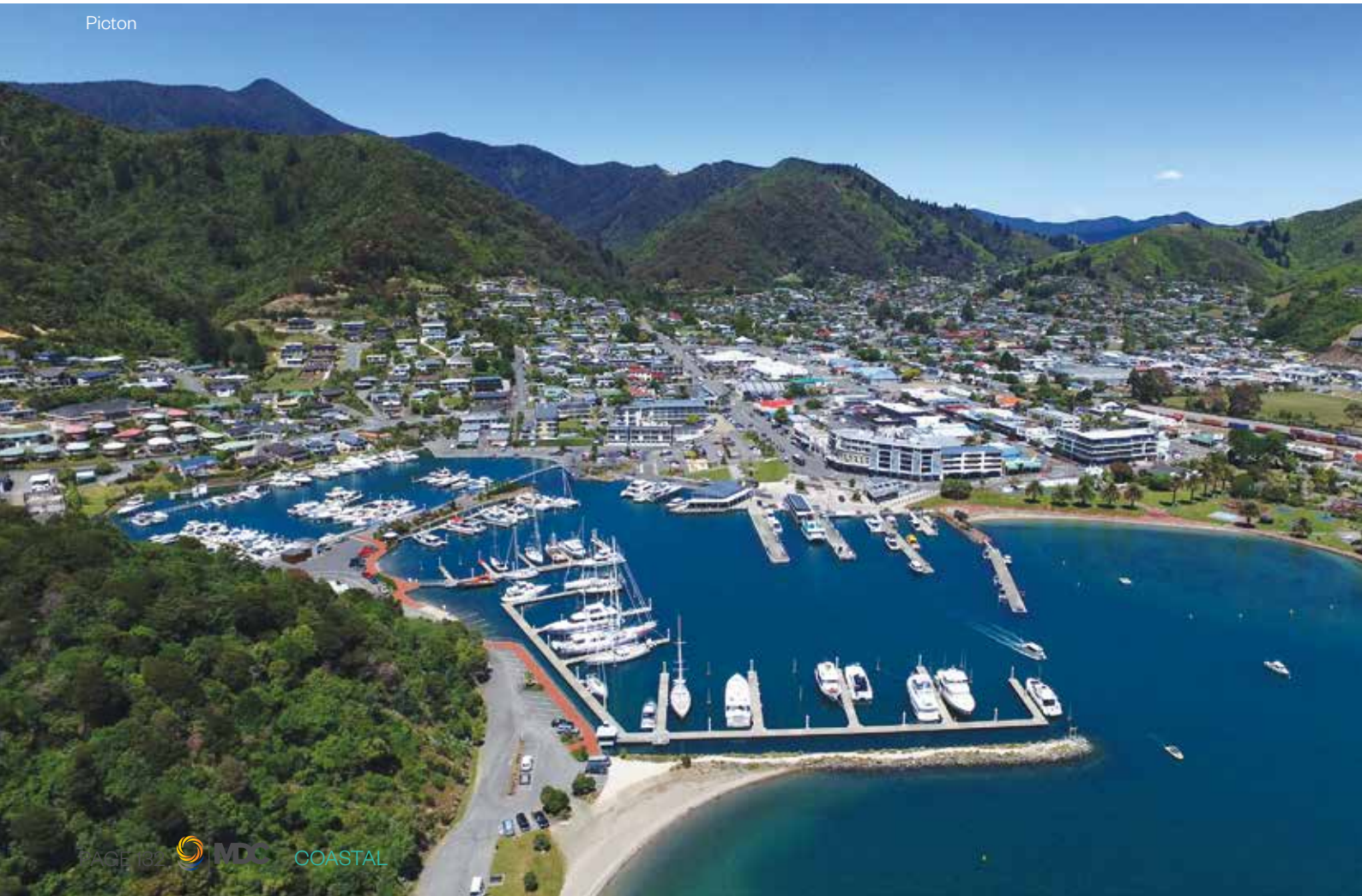
In 2011 the Council committed long-term funding for coastal science and monitoring programmes. This is now starting to deliver good information on water quality and habitats of significance to marine life.

In this chapter the state of Marlborough's different coastal environments is outlined, starting with an overview of coastal water quality, which is key to human and ecosystem health, particularly in the Sounds.

Section 1 looks at the Council's regular monitoring of swimming beaches. Generally it's safe to swim, but there are times where swimming is not advised due to faecal contaminants entering the water after heavy rain.

Discharges to coastal waters can also affect water quality. In Section 2 we take a look at the types of discharges that cause harm to people and those that can degrade the ecology.

Picton



Horohora Kakahu Island and Pipi Bay, Te Wanganui / Port Underwood

Section 3 takes this theme of ecosystem health and explores the general water quality of the Te Hoiere / Pelorus and Totaranui / Queen Charlotte Sound.

The health of coastal waters is also important for aquaculture, which is a significant activity in the Sounds and major contributor to Marlborough's economy. Section 4 examines the environmental effects of aquaculture and how these are being managed to achieve sustainable management.

Effective biosecurity is important for protecting farmed shellfish and salmon in Marlborough. Section 5 explores Council's response to incursions of unwanted organisms.

Biosecurity management is also necessary to protect significant sites for biodiversity. Section 6 outlines the state of marine biodiversity, which is vulnerable to fishing, habitat degradation and sedimentation.

Sedimentation is harming some of Marlborough's estuaries, which provide habitats for young fish, shellfish and wading birds, as well as being important for recreation.

In Section 7, the health of these important ecosystems is discussed alongside land-use activities that may impact upon them.

Recreational activities are popular in Marlborough's coastal environment. Section 8 takes a wider look at the effects of recreation on the coastal environment. Growing demand for moorings and jetties are social issues for Council to manage, as well as environmental issues.

The popularity of the Marlborough Sounds for recreation and tourism has led to increased ferry traffic. Section 9 shows how the Council monitors ship-wake effects on shorelines and marine ecosystems.

RECREATIONAL WATER QUALITY - COASTAL BEACHES

The Marlborough Sounds has many sheltered bays and beaches that are very popular swimming, kayaking and water skiing spots for locals and visitors. The region's most popular beach is Pukatea / Whites Bay, just north of Rarangi. Surfers are regularly seen along the more exposed parts of the east coast. Having good water quality is an important part of safely enjoying these places.

PRESSURE

Faecal contamination from people and animals can contain pathogens that can result in infections and serious health issues if swallowed or they come in contact with cuts and scratches. Faecal contamination usually comes from the land surrounding the beach or the catchment of a stream flowing into the sea. For most beaches, faecal contamination only occurs during or shortly after rain. Occasionally faecal contamination is also found when the weather is dry. The most likely source is from boats illegally discharging human effluent, leaking septic tanks, or birds.

RESPONSE

A 2012 survey identified the 12 most popular beaches in Marlborough. Each week from the beginning of November until the end of March, the Council monitors the recreational water quality at these beaches (Figure 1). Water samples are analysed for

WANT TO FIND OUT MORE?

- www.marlborough.govt.nz/Recreation/Swimming-and-Boating/
- www..lawa.org.nz/explore-data/coastal/

CHANGES SINCE 2008 SOE REPORT

- *Enterococci* concentrations at most of the beaches remain low or have decreased.
- There has been a significant improvement at the Picton Foreshore, where upgrades and repairs to the Picton sewage system have resulted in a substantial decrease in bacteria concentrations.

Pukatea / Whites Bay

Enterococci bacteria, which indicate the presence of micro-organisms that can be harmful to humans.

Monitoring results are compared to national guidelines to assess the risk to human health and the results are published on the Council website and the Land and Water Aotearoa (LAWA) website.

If the *Enterococci* levels are higher than the national guidelines, the Council takes additional water samples. If the additional samples also show elevated *Enterococci* levels, the Council notifies the Nelson Marlborough District Health Board Medical Officer of Health and takes guidance on alerting the public to the risk.

At beaches that regularly show high *Enterococci* counts, the Council tries to find out what is causing the faecal contamination and how to minimise it through catchment investigations. Faecal source tracking, which looks at genetic markers that are unique to certain animal groups or humans, can also help determine where the contamination has come from.

STATE

Council uses a grading system for the recreational water quality at each beach. The Suitability for Contact Recreation Grade (SFR Grade) is worked out from data collected over five consecutive years and ranges from Very Good to Very Poor. Apart from Picton Foreshore, which has a Poor grade, beaches in the region range from Very Good to Fair (Table 1). Upgrades to the Picton sewage system are benefiting the foreshore area, which is likely to see a significant improvement in recreational water quality and a further reduction in *Enterococci* concentrations. (See Coastal Discharges section).

The Council's Blue Fish on Drains education programme also raises awareness about the stormwater network connecting directly with local rivers and streams. The message is: anything that is put down a stormwater drain, such as dog poo or paint, will affect water quality where the stormwater discharges.

FUTURE RESPONSE

The Council will continue regular monitoring of the most popular beaches and investigate sources of faecal contamination when they occur. Action will be taken to reduce or eliminate sources of faecal contamination.

No.	Site	SFR Grade (Suitability for Contact Recreation Grade)
1	Moetapu Bay	Insufficient data
2	Mistletoe Bay	Very good
3	Anakiwa	Good
4	Momorangi Bay	Fair
5	Ngakuta Bay	Fair
6	Governors Bay	Insufficient data
7	Picton Foreshore	Poor
8	Waikawa Bay	Good
9	Robin Hood Bay East	Insufficient data
10	Robin Hood Bay West	Insufficient data
11	Whites Bay	Very good
12	Marfells Beach	Very good

Table 1: Suitability for recreation grading

Figure 1: Coastal beaches where water quality is assessed on a weekly basis over spring and summer

COASTAL DISCHARGES

Coastal water quality in Marlborough is generally good and the Council is responsible for regulating wastewater discharges to keep it that way. Consented discharge include human sewage, factory processing water, stormwater and feed for finfish farms (see Aquaculture section). Resource consent is required for all discharges to the coastal environment.

This chapter focuses on wastewater discharged from community schemes and tourist resorts in the Marlborough Sounds as well as Council wastewater schemes in Blenheim (into Te Koko-o-Kupe / Cloudy Bay), Havelock (Te Hoiere / Pelorus Estuary) and Picton (Queen Charlotte Sound / Totaranui).

PRESSURES

Contaminated coastal water can harm public health, coastal ecosystems, iwi values and industries such as tourism and aquaculture that depend on good water quality.

Even wastewater that has been treated to high standards may have adverse effects in certain coastal environments, which is why discharge to land is preferred.

Faecal coliforms from wastewater can make it unsafe to swim or eat shellfish. Wastewater also introduces nutrients such as nitrates and phosphorus into coastal waters, which can lead to algal blooms. If nutrient concentrations get too high, some algal blooms produce toxins that also make it unsafe to swim in the sea or eat shellfish.

RESPONSE

The Marlborough Sounds is well known for its recreational opportunities and marine ecology, so it is important to assess any discharge that may threaten these.

CHANGES SINCE 2008 SOE REPORT

- The number of wastewater discharges in Marlborough's coastal waters has been steadily dropping. The 1994 State of the Environment report showed 24 resource consents for discharge from community sewerage schemes, resorts or camping grounds. In 2008 this had reduced to six. Four of those were Council schemes and the other two were resorts (Table 1).
- Since 2008, the Council schemes have been significantly upgraded and the Spring Creek wastewater scheme stopped discharging into Wairau River in 2010.

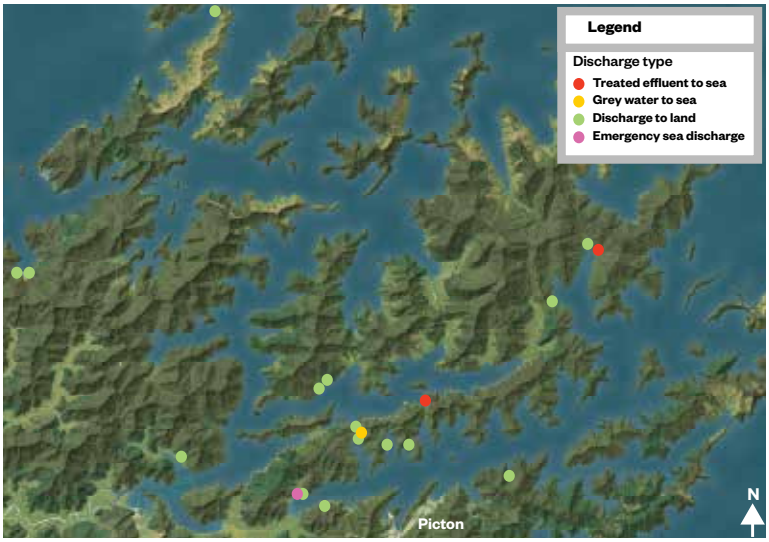


Figure 1: Location of discharges from tourist facilities monitored annually

The Council's three township sewerage schemes are monitored each year. Port Marlborough consents are also monitored, along with discharges from mussel processing factories.

Council monitors 18 high-volume wastewater discharges from tourist resorts (Figure 1). The majority discharge their wastewater to land. As at 1 July 2015, there were only three discharges directly to sea: one for greywater, another emergency overflow and the other is converting to a land-based treatment system.

Marlborough's new Resource Management Plan will encourage wastewater to be discharged to land rather than into the sea. It also seeks to prohibit any untreated human sewage going into coastal waters.

STATE

The Council discharges treated wastewater at Havelock, Picton and the Wairau Lagoon entrance. Water quality and seabed monitoring shows these discharges are within their consent conditions.

Port Marlborough's stormwater discharge at Shakespeare Bay is compliant for water quality, seabed and shellfish health. Mussel factory discharges are also operating within their consent conditions.

Tourism facilities

Effluent discharge has improved at all Sounds tourist resorts since 2008. However, annual monitoring shows that issues arise from time to time, such as land-based dripper pipes in the wrong place, tree roots disturbing the soakage field and in one instance, raw sewage was illegally discharged into the sea.

Compliance with resource consent conditions is relatively consistent at about 65% (Figure 2). When remedial action was required nearly all consent holders were able to fix the issue.

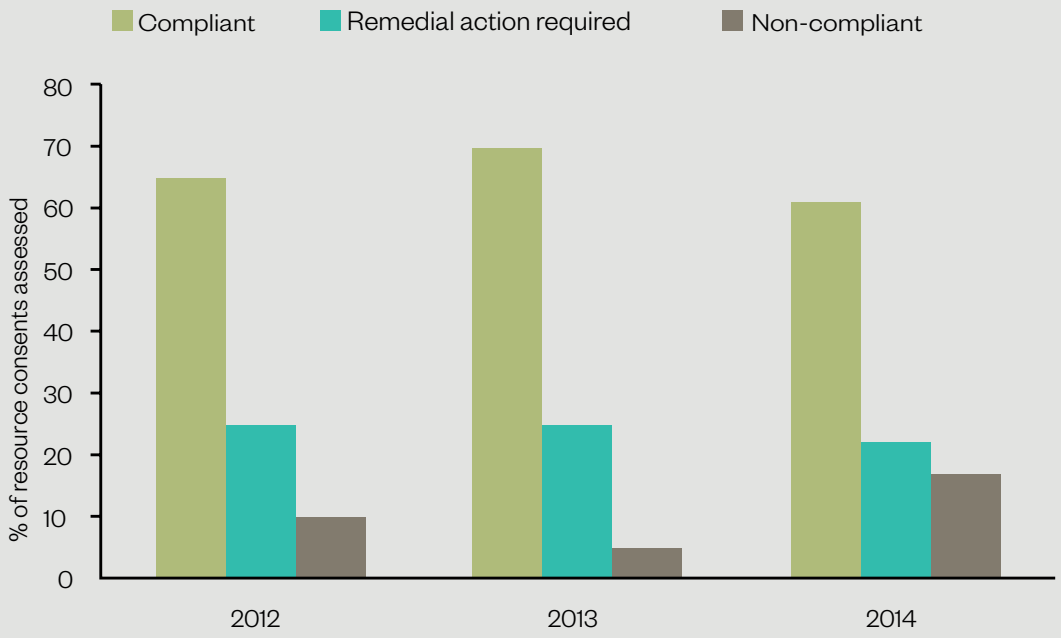
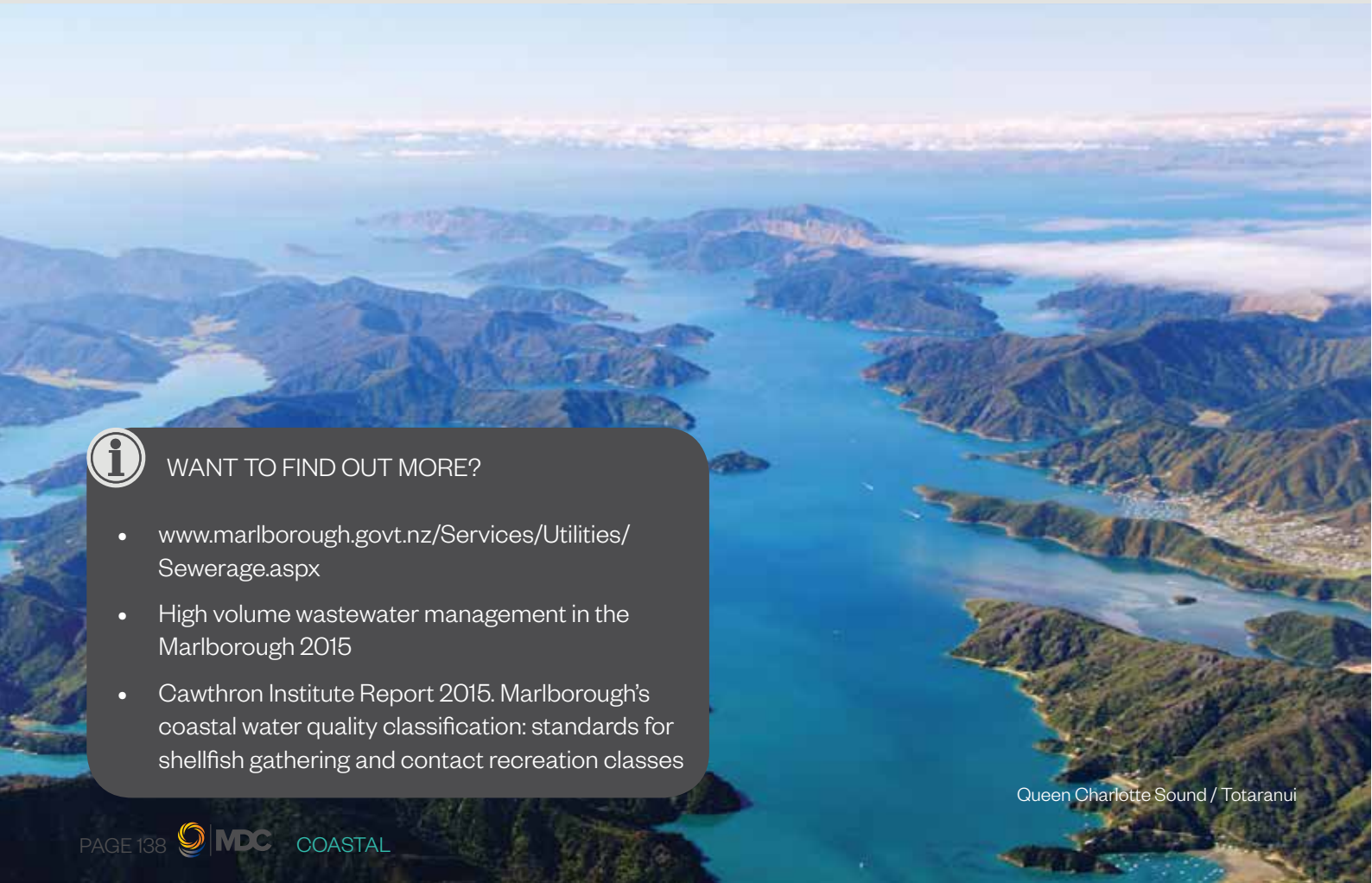


Figure 2: Percentage of resource consents that complied with consent conditions

Waikawa Bay

Table 1: Changes to discharge management since 2008. There are now only three significant discharges into coastal waters and these are all upgraded town sewerage schemes run by Council.

DISCHARGE SOURCE	RECEIVING ENVIRONMENT	CHANGE SINCE 2008
Havelock	Te Hoiere / Pelorus Estuary	Upgraded in 2011 with second pond to meet higher water quality standards
Blenheim, Renwick, Woodbourne	Te Koko-o-Kupe / Cloudy Bay	Upgraded in 2014 with the installation of new ponds at the Hardings Road treatment site. The discharge into the Ōpaoa River has stopped
Spring Creek municipal	Te Koko-o-Kupe / Cloudy Bay via Wairau River	Diverted into the Hardings Road treatment site from 2010. The discharge into the Wairau River has stopped
Picton/Waikawa municipal	Queen Charlotte Sound / Totaranui	Upgraded in 2014 to treat wastewater to meet higher water quality standards. A new outfall installed and the old one to Kaipupu Point removed
Furneaux Lodge	Endeavour Inlet	Discharge to land implemented in 2014
Portage Hotel	Kenepuru Sound	Discharge to land implemented in 2015



WANT TO FIND OUT MORE?

- www.marlborough.govt.nz/Services/Utilities/Sewerage.aspx
- High volume wastewater management in the Marlborough 2015
- Cawthron Institute Report 2015. Marlborough's coastal water quality classification: standards for shellfish gathering and contact recreation classes

Queen Charlotte Sound / Totaranui

COASTAL WATER QUALITY

Marlborough's coastal waters cover about 725,000 ha with 1,800 km of coastline. It is home to a variety of wildlife including dolphins, seals, seabirds and prized fish species and is a special place for many people to work and play.

Good water quality is essential for sustaining life in our coastal marine environment. The Council has responsibilities under the Resource Management Act to safeguard these ecosystems and to maintain biodiversity. It does this by regulating activities on land and in the coastal marine area that could harm coastal water quality.

PRESSURE

Coastal water can be polluted in two ways:

- point source discharge from a single input such as a sewage outfall, a factory, wastewater pipe, finfish farm or effluent from a boat
- non-point source discharge comes from a wider area such as sedimentation from forestry and farm run-off or nutrient enrichment and bacterial contaminants washed in from waterways.

Water quality also fluctuates with floods, tides, winds, currents and temperature. These factors can interact and create cumulative effects - the ecosystem may be resilient enough to cope with one stress, but it can be degraded when several combine.

Too many nutrients from sources such as fish farms or forestry and farming run-off can lead to coastal waters becoming enriched with plankton, resulting in algal blooms. Some of these blooms are toxic to marine animals and also to humans if they eat contaminated shellfish.

Shellfish can also be contaminated by faecal matter and heavy metals. Seafloor sediments are at risk from heavy metals, polychlorinated biphenyls (PCBs) and other chemical compounds that harm the biological communities and can build up in the food chain.

CHANGES SINCE THE 2008 SOE REPORT

- The Council has made significant progress in monitoring coastal water quality since the last State of the Environment report. There are now 22 sites regularly monitored in the Queen Charlotte and Te Hoiere / Pelorus Sounds (Figure 1). This provides solid information for understanding water quality in the Sounds and making good decisions on resource consents.

Monitoring coastal water quality

RESPONSE

Council manages point source discharges by setting conditions in resource consents to protect the environment (see chapters on Coastal Discharges and Aquaculture). These consent conditions are monitored for compliance.

The review of the Regional Coastal Plan sets out water quality standards for shellfish gathering and contact recreation such as swimming. Renewals and new discharge consents will have to meet these standards.

Non-point source discharges such as sediment washing into the Sounds from forestry are more difficult to identify and manage. Council are considering rules for riparian setbacks on forestry blocks - this is a buffer zone of bush and trees left along coastal margins and waterways to reduce sediment running off harvested hills and ending up in coastal waters. Council is also carrying out research to track back where sediment is coming from and how

much is going into the Sounds. This information will feed into regulations and other initiatives to reduce the amount of fine sediment in coastal waters.

Council was involved in setting interim water quality standards for the three new salmon farms granted by the Environmental Protection Authority in 2013. The new farms in Outer Te Hoiere / Pelorus Sound and Tory Channel must operate within permitted levels of chlorophyll, nitrogen and dissolved oxygen. Council will continue to collect monthly data to check that the farms are not breaching water quality standards.

The National Institute of Water and Atmospheric Research (NIWA) has developed hydrodynamic models for Queen Charlotte and Te Hoiere / Pelorus Sounds. These models simulate how the tides and currents flush in and out of the Sounds, how nutrients come and go and where algal blooms may form.

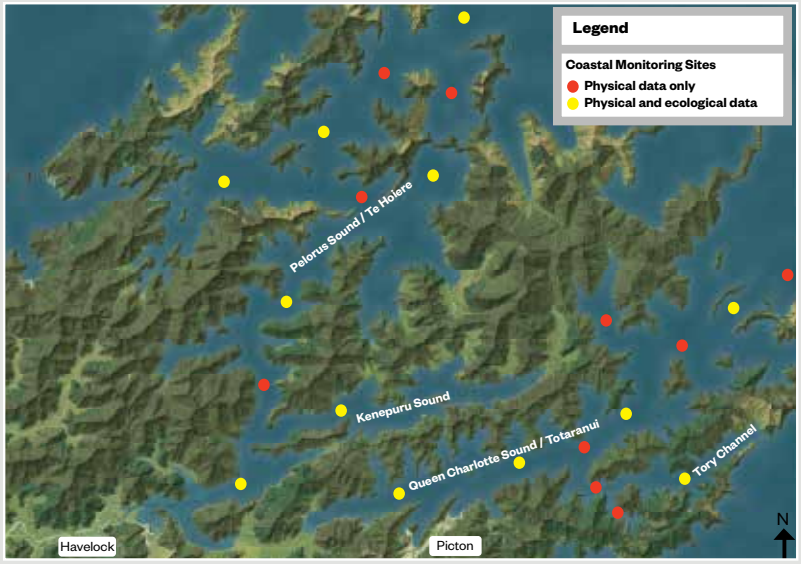


Figure 1: Current location of monthly monitoring sites in the Marlborough Sounds.

STATE

Council has been monitoring water quality in Te Hoiere / Pelorus and Queen Charlotte Sound / Totaranui since 2011. This programme will continue and the information gathered will improve our understanding of the condition of the Marlborough Sounds and environmental trends.

The hydrodynamic modelling indicates that water quality in the Sounds is generally good and not at foreseeable risk of excessive nutrient loading (See Want to find out more?).

Council collects swimming water samples at 12 beaches on the East Coast and Marlborough Sounds each summer, with results published on the Land and Water Aotearoa (LAWA) website. There is generally a low to moderate risk of bacterial contamination at Marlborough's beaches (see Recreational Water Quality chapter).

WANT TO FIND OUT MORE?

- www.marlborough.govt.nz/Environment/Coastal
- www.lawa.org.nz/explore-data/marlborough-region/coastal/

Tennyson Inlet

AQUACULTURE

The sheltered bays and clean waters of the Marlborough Sounds make it a popular environment for marine farming (aquaculture), with approximately 70% of New Zealand's green-lipped mussels and king salmon grown here. Other species such as oysters, paua and seaweed are also commercially farmed in the Marlborough Sounds (Figure 1).

Aquaculture in the Sounds earned $324 million in exports in 2014 and the continued success of the industry depends on maintaining good water quality for the health of the farmed species, food safety and the wider marine environment.

Under the New Zealand Coastal Policy Statement, the Council is required to provide space and good water quality for aquaculture. This sits alongside the Council's responsibility to sustainably manage marine ecosystems. Water quality is monitored each month (see Coastal Water Quality section) and impacts on the seabed from salmon farms are monitored and checked each year against resource consent conditions.

Council also undertakes research into the cumulative effects of aquaculture in the Marlborough Sounds.

CHANGES SINCE THE 2008 SOE REPORT

- Over the past seven years the number of mussel farms has increased from 522 to 575 and five more finfish farms have been approved.
- There is a better understanding of the effects of finfish farming on the seabed. Best practice guidelines for salmon farms have been developed and could be applied to other finfish species. These guidelines should reduce the risk of localised dead zones under farms.
- The Council has had biophysical models of the Te Hoiere / Pelorus and Queen Charlotte Sound / Totaranu is designed to predict the effects of nitrogen discharge from aquaculture. These models are underpinned by the Council's water quality sampling, which started in Queen Charlotte Sound / Totaranui in 2011 and Te Hoiere / Pelorus in 2012.

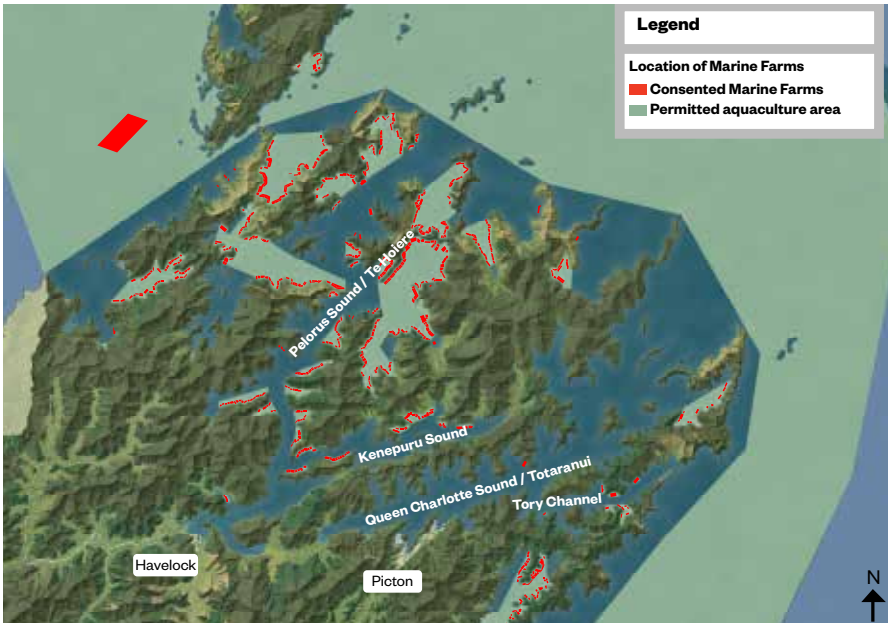


Figure 1: Location and extent of marine farms in the Marlborough Sounds, 2015.

PRESSURE

The most important ecological effects of aquaculture are discharge into the water column, build-up of finfish farm waste on the seabed and localised depletion of zooplankton from mussel farms. Council works with the marine farming industry and Ministry for Primary Industries (MPI) to manage and better understand these impacts. There are also community pressures to identify the cumulative effect of marine farms and to find an ecological and social consensus on a sustainable level of aquaculture.

Water column effects

Fish farms and mussel farms have different effects on the water column. This is because of the way they are produced – farmed salmon are fed pellets of food, whereas mussels filter plankton and other microscopic creatures out of the water.

Salmon farms discharge thousands of tonnes of pelleted feed each year that is eaten by the fish and excreted as nitrogen waste. Fish farms aren't the only source of nitrogen in the Sounds - nitrogen and other nutrients also come in on the tide from Cook Strait, from freshwater streams and rivers and from faeces of fish, birds and marine mammals.

Too much nitrogen can lead to big increases in plankton, resulting in algal blooms. These blooms may be toxic to marine animals and people who eat contaminated shellfish. Sustainable aquaculture depends on ensuring nitrogen levels are well managed. Monitoring and modelling suggests the Sounds can currently absorb waste from fish farms without excessive nutrient loading.

Mussels fatten up by removing nutrients from the water column. This can improve water clarity and help prevent algal blooms. Mussel farms near fish farms may reduce nutrients from fish faeces.

In mussel farming areas, plankton is depleted around each farm and this can result in a widespread temporary loss of plankton if there are too many mussel lines in a low-flow bay.

Plankton levels also change naturally depending on El Nino/La Nina weather patterns. Modelling suggests that these weather patterns have more influence on ecosystem productivity than the effects of mussel farms. However, in La Nina years, depletion of zoo-plankton may be an issue.

WANT TO FIND OUT MORE?

- www.marlborough.govt.nz/Environment/Coastal/Best-Practice-Guidelines-for-Salmon-Farming.aspx
- www.marlborough.govt.nz/Environment/Coastal/Coastal
- www.fish.govt.nz/en-nz/Commercial/Aquaculture/Marine-based+Aquaculture/Aquaculture+Ecological+Guidance.htm.
- www.marinefarming.co.nz/
- www.aquaculture.org.nz/

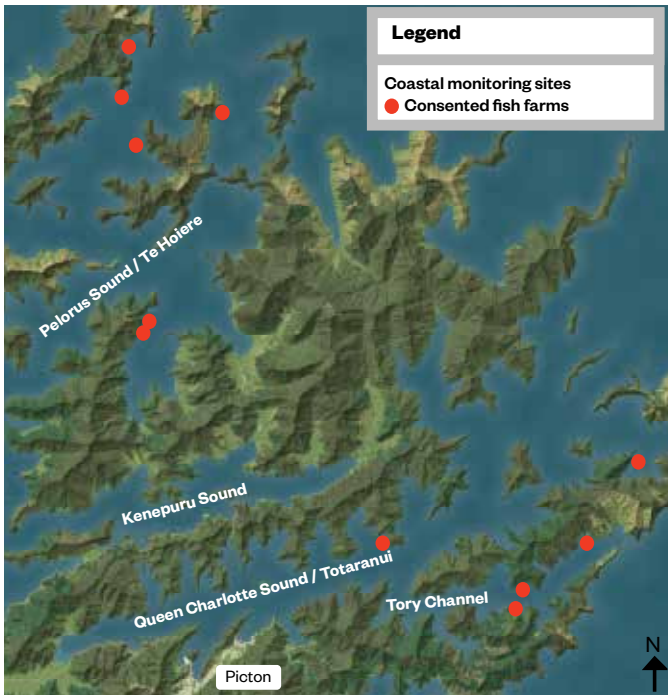


Figure 2: Location of consented fish farms in the Marlborough Sounds, 2015

Seabed effects

Organic waste from fish farms, including faeces, uneaten food pellets and seaweed cleaned off nets builds up on the seabed and reduces the oxygen available for seabed organisms to thrive.

This is called enrichment and it affects the diversity and abundance of seabed organisms. In extreme cases the seabed around fish pens can become like a dead zone, with the chemical reactions in the layer of waste releasing poisonous gases such as hydrogen sulphide and methane.

Enrichment under mussel farms is milder compared with fish farms. The main deposits are mussel shells falling off the lines. These may affect organisms that forage on the seabed or live in the sediments but not necessarily harm the overall biodiversity.

Mussel farm enrichment may change the way the seabed turns nitrogen into nitrogen gas. This process is called denitrification and helps remove nitrogen from the marine ecosystem and prevent nitrogen build-ups. Little is known about the effect of mussel farms on denitrification.

BEST PRACTICE GUIDELINES FOR SALMON FARM MANAGEMENT

The NZ King Salmon 2012 application for more farms in the Marlborough Sounds highlighted the need for co-operation between industry, Council and the community when it comes to protecting the Sounds.

That protection comes from those conditions in a farm's resource consent that state what can and cannot be done in the marine environment. It is the Council's job to monitor and enforce those conditions.

Professor Black discussing environmental best practice

Historically, environmental standards vary from salmon farm to salmon farm, depending on when the consents were granted. To be consistent and help with compliance, King Salmon volunteered to work with Council, scientists and the community (represented by the Sounds Advisory Group) to develop best practice guidelines.

Council sought the advice of Professor Kenneth Black of the Scottish Association for Marine Sciences to identify where consent monitoring could be improved. Professor Black visited Marlborough in 2013 and provided expert review as the guidelines developed.

With the benefit of more research into the environmental impact of finfish farming on the seafloor, this collaborative approach has come up with clear performance targets that aim for well-managed salmon farming in balance with the ecology of the Sounds.

King Salmon and Council sought public comment on the guidelines in October 2014. Some minor changes were made and the guidelines were presented to Council in November 2014.

King Salmon commenced implementing the guidelines in 2015, when the Te Pangu Farm in Tory Channel went through a consent renewal process. The farming consent was successfully renewed without the need for an expensive public hearing, which illustrated that a genuine willingness to cooperate on solutions can have positive outcomes for all.

Salmon farm

RESPONSE

Fish farms

Council resource consents regulate how much food can be discharged at each fish farm based on the speed of currents around the farm and the effects on the seabed. All farms are monitored annually by an independent science provider and the results assessed by Council for compliance. Council has ongoing assistance from Professor Kenneth Black an international expert on the environmental effects of salmon farming.

Environmental standards in these consents vary depending on when they were granted and are open to interpretation. To improve consistency, Council partnered with New Zealand King Salmon, MPI, the Cawthron Institute, the NIWA and the Sounds Advisory Group to develop best practice guidelines for salmon farming. These guidelines aim to avoid excessive enrichment and protect the health of the seabed.

The EPA approved three new salmon farms in the Sounds in 2013 and interim water quality standards were set two years later, which state the permitted levels of chlorophyll, nitrogen and dissolved oxygen at the new farms in the Outer Te Hoiere / Pelorus and Tory Channel. Council monitors water quality each month to check that these standards are met.

Mussel farms

Council has developed hydrodynamic models of Queen Charlotte and Te Hoiere / Pelorus Sounds that simulate the movement of wind, tide, temperature and current. This increases our understanding of seasonal nutrient and plankton fluctuations and the influence of aquaculture on ecosystem function.

Council plans to collaborate with industry to find out more about denitrification and will use this information in future hydrodynamic models. Council is also looking at the possibility of installing instruments to collect continuous water quality data.

STATE

Council's ongoing water quality monitoring will improve our understanding of conditions and trends in the Marlborough Sounds.

The hydrodynamic modelling for water quality suggests that mussel farms can deplete zooplankton in some sheltered bays and low flow areas of Te Hoiere / Pelorus Sound.

Apart from compliance monitoring by resource consent holders there is no state of the environment monitoring of seabed conditions. Council is contributing to the development of DNA monitoring tools that may make seabed monitoring over a large area more affordable.

Mussel farm

MARINE BIOSECURITY

Invasive pests can have dramatic consequences on coastal ecosystems and aquaculture. Marine biosecurity is about preventing, containing and eradicating pest invaders that compete with native species.

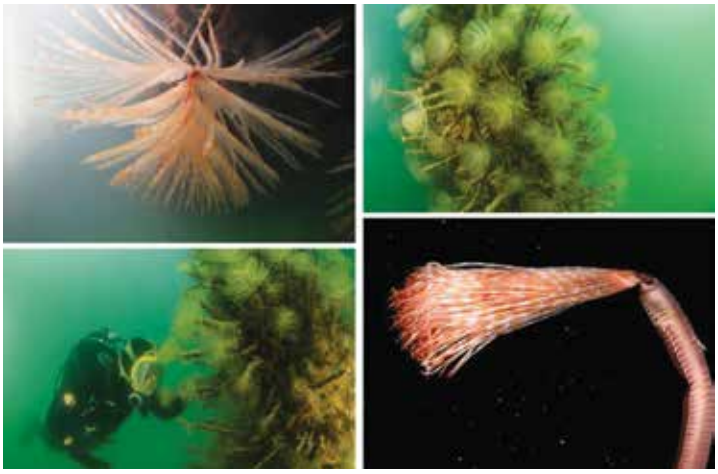
The most common marine pests are fouling species that come into the Sounds on the underside of vessels. Their larvae attach to structures and can be transported by other vessels around the sheltered bays of the Sounds.

Marine pests can have an economic impact on the aquaculture industry. Discoveries include a new oyster parasite *Bonamia ostreae* in native flat oysters in Te Wanganui / Port Underwood and the sea squirts *Styela clava* and *Didemnum vexillum* that affect mussels. These threats may increase with climate change.

Heavily fouled yacht with Mediterranean fanworm found in Waikawa Bay, 2014. Vessel hulls should be inspected and cleaned regularly to prevent infestations and spread

CHANGES SINCE THE 2008 SOE REPORT

- An invasive sea squirt - *Styela clava* - while at this point confined, has become established in Marlborough waters.
- Mediterranean fanworm has been detected in Picton Marina and on multiple vessels. The threat of this species establishing has increased markedly.
- *Didendum vexillum* became widely established in Marlborough waters, although impacts on the aquaculture industry have been variable.



PRESSURE

Marlborough's marine biosecurity is influenced by several factors.

Marine pests in other parts of New Zealand

Marine pests already well-established in other parts of New Zealand have been found in the Marlborough Sounds. These include the invasive sea squirt *Styela clava* previously found in Northland, Auckland, Coromandel, Nelson and Dunedin and the Mediterranean fanworm *Sabella spallanzanii,* which is established in Auckland and Lyttleton and has also been detected in Northland, Coromandel, Tauranga and Nelson. Both of these species were found in Picton Marina in 2014.

The time delay between a marine pest arriving and being detected

Invasive marine pests often arrive unnoticed and in low numbers and can quickly build up and spread before being discovered. This makes it critical to prevent them arriving in the first place or detect them while they are at low densities.

Some of the Styela clava specimens removed during the intial response in June 2013

The large number of boats coming into Marlborough

The Marlborough Sounds are popular with recreational boaties who often bring their vessels from other parts of New Zealand. Marine pests hitchhike on the hulls of poorly maintained vessels, so Marlborough is at risk from these boats that may introduce new invasive pests or increase their numbers.

A lack of knowledge and tools to deal with marine pests

The tools available to control or manage marine pests are still in their infancy compared to managing land-based pests. Marine invaders are below the water and not easy to see unless boaties make a conscious effort to check for fouling on the underside of their boats.

Boats and owners are not registered

In New Zealand, boats and their owners are not registered which makes it difficult to communicate with boaties or enforce potential regulations to manage marine pests.

RESPONSE

The Council takes two approaches to marine pest invasion – regulation and education. Resource consent conditions and compliance aim to reduce the risk. Research, dive surveys and awareness campaigns aim to teach people about marine pests and what they can do to prevent spread.

Council also works closely with the Ministry for Primary Industries (MPI), neighbouring councils, marine industry groups and iwi in the Top of the

CASE STUDY
Styela clava incursion and management

PRESSURE

Styela clava is an invasive sea squirt (clubbed tunicate) that has been established in New Zealand since 2005. It was first detected in Waitemata Harbour in Auckland and subsequently was found in other places around New Zealand.

During surveillance for marine pests in June 2013, NIWA scientists found *Styela* in the Picton Marina and notified MPI, who worked with Council on a joint response.

RESPONSE

Council enlisted contract divers with support from MPI and the Department of Conservation (DOC). The first set of dive surveys found 100 specimens which were carefully removed. This infestation was contained to the inner Picton Marina (Figure 1). Further dives in September and December 2013 found very few specimens and the signs were positive.

In January 2014 a Long Term Management Plan (LTMP) was signed between the Council, MPI, Port Marlborough and the Marine Farming Association, which includes dive surveys twice a year. Further *Styela* infestations were discovered in both Waikawa Bay and Waikawa Marina in February 2014 during survey work on the Mediterranean fanworm *Sabella*. More dive surveys in July 2014, November 2014 and May 2015 discovered reasonable numbers of *Styela* in both Picton Marina and across Waikawa Bay and Marina. Divers removed them.

STATE

Surveys show *Styela* is well established but in low numbers and still able to be removed by divers. The LTMP for *Styela* was a new approach for both Council and MPI. The collaborative process has worked well, with measured and transparent decision-making. As part of the LTMP the Council reports back to its partners after each dive survey and they discuss the next steps.

South Marine Biosecurity Partnership (TOS). This group aims to broaden awareness, maintain networks and find ways to improve risk management.

Working with the TOS and building direct relationships with MPI has helped the Council improve its detection of and response to marine pests as was shown in 2013 and 2014 with the discovery of *Styela* and *Sabella* in Marlborough waters. Regular dive surveys are currently being conducted to suppress *Styela*, eliminate *Sabella* and detect other invasive marine pests.

The TOS and government agencies are carrying out research to better understand how to reduce the risk of spread and subsequently deal with marine pests once they're detected.

STATE

Didemnum was highlighted in the 2008 State of the Environment Report as a recent arrival. It was joined by two new pests in 2013 and 2014, *Styela* and *Sabella*. Both these species could impact on the aquaculture industry and marine ecosystems in the Sounds.

Styela is well-established in Picton and Waikawa, although in relatively low densities. Fewer than five individual specimens of *Sabella* have been detected on rocky substrates in Picton, but a single yacht in Waikawa was found with 12 mature *Sabella* clinging to its hull.

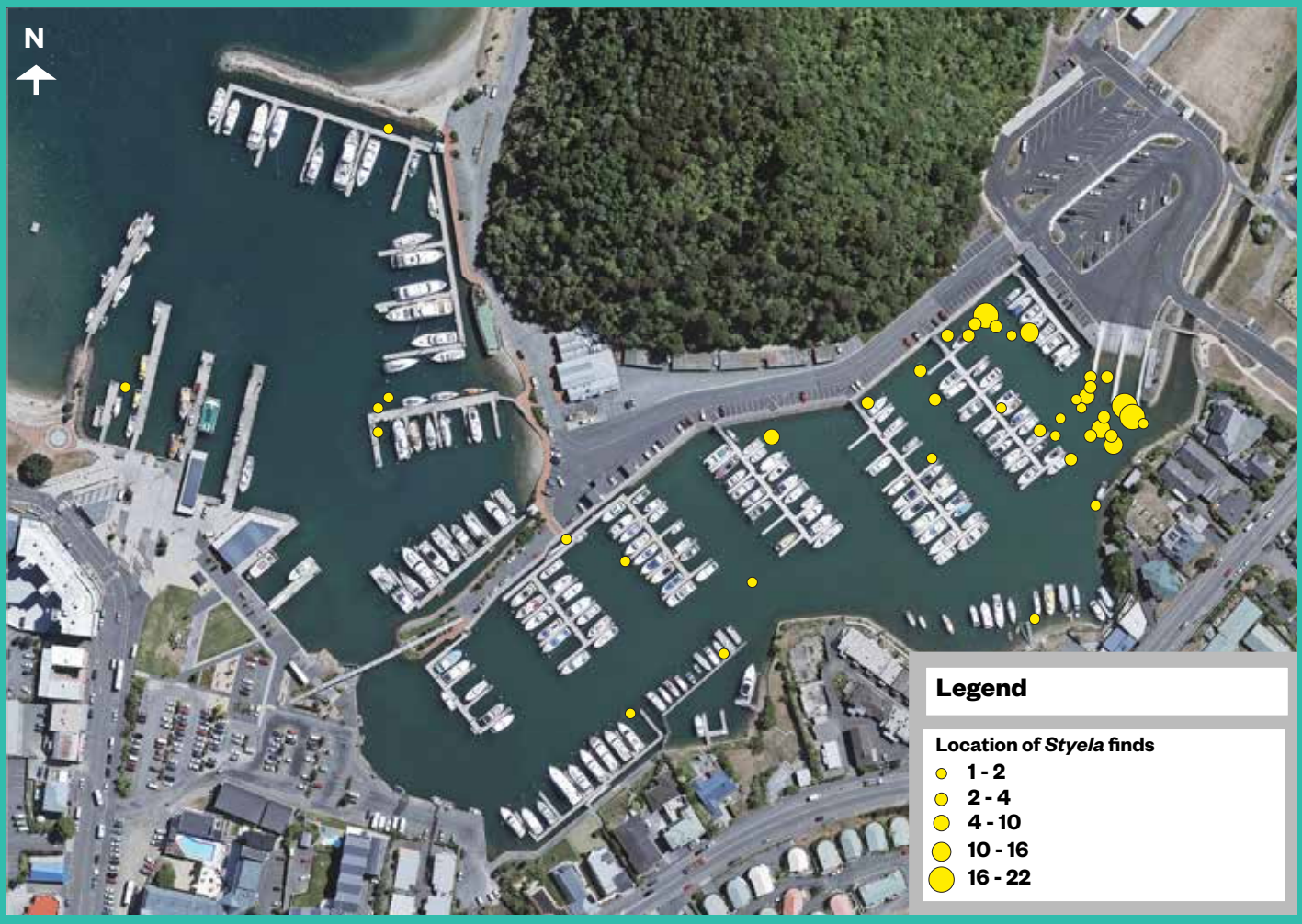


Figure 1. *Styela clava* finds during the May 2015 dive survey.

MARINE BIODIVERSITY

The coastal waters around Marlborough support a wide range of wildlife including dolphins, seals, seabirds and fish. These in turn depend on seabed habitats that are home to marine invertebrates and plants such as hydroids, rhodoliths, horse mussels, tubeworms and kelp beds.

These living or 'biogenic' habitats form three-dimensional structures that provide establishment sites, shelter and food for the plants and small invertebrates that other species feed upon.

Dredging, bottom-trawling and sedimentation have severely damaged these biogenic habitats in the past 100 years and this has knock-on effects for the species they support.

PRESSURE

Bottom-trawling and dredging for fish and shellfish disturbs the seabed, stirring up and re-suspending fine sediments. This reduces light, disrupts photosynthesis for aquatic plants, and smothers

CHANGES SINCE THE 2008 SOE REPORT

- Council has made a significant effort to start characterising marine biodiversity values since the 2008 State of the Environment report. There is a now an inventory of sites known to contain significant biodiversity values and a survey and monitoring programme to provide up-to-date information on these sites.

Giant LampShell - Photograph supplied by Rob Davidson

Blue cod over biogenic habitat - Photograph supplied by Rob Davidson

sensitive habitats such as seagrass and kelp beds. These are important places for fish such as snapper, terakihi and butterfish. The bottom disturbance also removes filter-feeders such as naturally occurring green-lip mussel beds. There used to be extensive mussel beds in the Sounds which filtered sediment and organic detritus out of the water.

Each year, thousands of tonnes of fine sediment wash into Te Hoiere / Pelorus Sound from the Te Hoiere / Pelorus and Kaituna Rivers. Without the mussels to process it, much of this sediment builds up as mud on the seabed. Sediment also washes into the Sounds from recently harvested forestry blocks, smothering biogenic habitats.

Commercial and recreational fishing puts pressure on biodiversity and ecosystems. This leads to tighter recreational limits on many species, including blue cod and snapper. The decline of key species such as snapper and crayfish has a knock-on effect through the food chain, for example an increase in kina and loss of kelp.

Other threats to sensitive seabed habitats are foreshore structures such as jetties, dragging anchors, land reclamation, dumping of dredged spoil and damage from ferry wash (see Ship Wake section). Climate change and warmer sea temperatures help spread marine biosecurity pests such as the Mediterranean fanworm and sea squirts (see Marine Biosecurity section). Warmer seawater may also cause more farmed salmon to die.

Increased CO_2 emissions are making oceans more acidic. As CO_2 flows into coastal waters the change in chemistry damages biogenic habitats and makes it harder for shellfish such as mussels and oysters to form their shells. Increased nutrients from land run-off can also acidify coastal waters.

WANT TO FIND OUT MORE?

- marlborough.govt.nz/Environment/Coastal/Coastal-Ecosystems/Significant-Marine-Sites.aspx
- www.sustainableseaschallenge.co.nz/
- www.marlmarinefutures.co.nz/
- www.doc.govt.nz/Documents/conservation/marine-and-coastal/marine-protected-areas/long-island-monitoring-report.pdf

Horse Mussel - Photograph supplied by Rob Davidson

RESPONSE

Under the Resource Management Act the Council must safeguard the life-supporting capacity of ecosystems and maintain biodiversity. Council regulates coastal structures to manage environmental effects and may also prevent seabed disturbance such as dredging in significant marine sites.

In 2011 the Council undertook a stock-take of all known biogenic habitats, as well as sites of importance for birds and marine mammals. It identified 129 ecologically significant sites in Marlborough's coastal waters and now carries out an annual survey to monitor their size and health. Of 21 sites reviewed in 2015, nine were smaller than originally surveyed and three were lost because of bottom trawling, dredging and sedimentation.

Understanding long-term ecological change will help the Council manage biodiversity more effectively. A 2014 study into seabed habitats in Te Hoiere / Pelorus Sound since European settlement showed dramatic effects from dredging and sedimentation and a significant loss of biodiversity. Core samples from the seabed will help scientists understand where

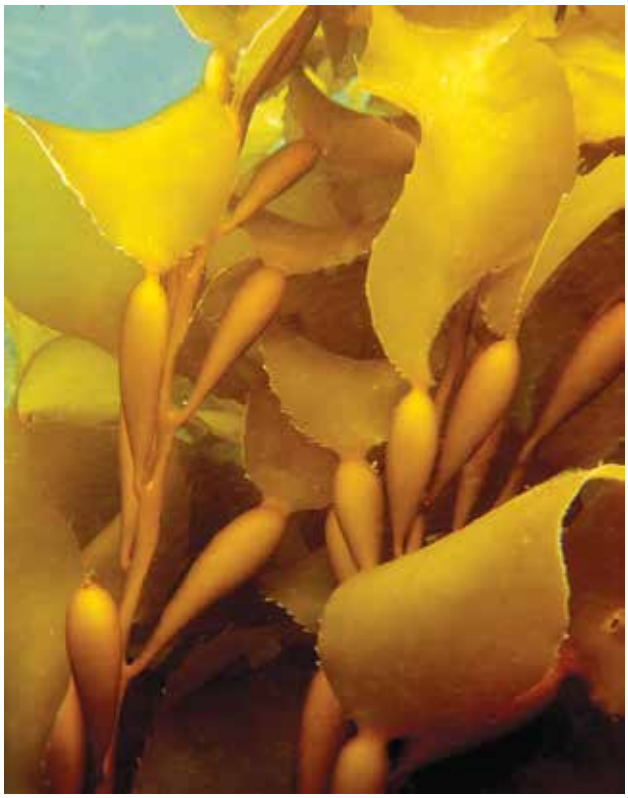
the sediment has come from over time, what caused it and whether we can change land use practices to reduce the build-up of mud.

The Council has provided seed funding for Marlborough Marine Futures, a community-led initiative to develop a "rich, abundant and sustainable future for the Marlborough marine environment".

STATE

Marlborough's marine biodiversity is not in good shape, particularly in the Sounds. The significant issues are: fewer fish, not as many species, serious loss of biogenic habitats, sedimentation in estuaries smothering thousands of hectares of seabed and biosecurity incursions.

In contrast, annual monitoring of Long Island Marine Reserve in Queen Charlotte Sound / Totaranui shows a healthy marine habitat. Blue cod, crayfish, paua and kelp are all abundant within the reserve compared to other parts of Queen Charlotte Sound / Totaranui. There are ten times more crayfish and three times more blue cod inside the reserve than out.



Giant kelp

Sea perch

ESTUARIES

Healthy estuaries are home to a wide range of fish, birds and aquatic invertebrates. As well as being important ecosystems, estuaries are a place for people to collect shellfish, boat, fish, walk and enjoy the nature and views.

There are over 20 estuaries in Marlborough, ranging in size from the extensive Wairau Lagoon near Blenheim to smaller stream estuaries in the Marlborough Sounds such as Anakoha and Tuna Bay. Most of Marlborough's estuaries are significant ecological sites.

The Council works to maintain and enhance water quality to protect estuary habitats and allow safe seafood collection.

PRESSURE

Natural forces and human activities both play a role in the health of estuaries.

Sedimentation

Estuaries help process run-off from different land uses in the surrounding area; they are natural sinks for sediments carried down by rivers and streams. However, the rate of sedimentation has increased dramatically since European settlement. Soil erosion from forestry, farming and other land uses contributes to turbid (cloudy) conditions, poor water quality and excessive mud. This reduces habitat for shellfish, birds and fish and can smother plants such as seagrass that provide shelter and feeding areas for juvenile fish. Muddy estuaries also affect swimming and fishing.

Eutrophication

Farming and forestry run-off may cause excessive nutrients (eutrophication) in the estuary, which nuisance seaweeds such as sea lettuce thrive on. Following storms, large masses of seaweeds rot on the shore, producing a rotten egg-type smell due to anaerobic decay. Ecologically valuable seagrass beds that filter the water can be reduced or lost. Phytoplankton may also bloom in nutrient-rich estuaries, removing oxygen from the water and making it harder for fish to survive. Some algal blooms are harmful to humans.

Toxic contamination

Heavy metals, oil spills, contaminants, agricultural chemicals (including pesticides) and anti-fouling paints from boats harm the health of an estuary. These toxins are introduced by discharges, stormwater and run-off from land and become embedded in sediments or absorbed into the food chain, potentially affecting shellfish, fish and humans.

CHANGES SINCE THE 2008 SOE REPORT

- The Council has started work on characterising Marlborough's estuaries. Reports have been produced for Ngakuta Bay, Okiwa Bay, Havelock and Wairau estuaries. All estuaries are scheduled for survey and monitoring over a ten year period.

Whangarae Bay

CASE STUDY
Havelock Estuary

Havelock is one of the most important estuaries in the region and is fed by the Kaituna, Te Hoiere / Pelorus, Wakamarina and Rai catchments. It is an ecological 'filter', trapping and processing sediments and nutrients from these rivers. However, studies since 2001 have shown the estuary is becoming a lot muddier, which reduces the habitat for shellfish, fish and birds.

PRESSURE

A range of land uses and activities impact upon the estuary. These include forestry, farming, factory wastewater, discharge from the Havelock oxidation ponds and stormwater and runoff from Havelock town.

Havelock Estuary

The estuary was monitored in 2001 and since then several significant events have affected the estuary's ecology. These include the decay of 50 hectares of the invasive cord-grass *Spartina* after spraying by the Council and DoC; large storms in 2008, 2010 and 2012 which deposited large quantities of sediment into the estuary, and the start of pine forest harvesting in the Wakamarina, Rai, Te Hoiere / Pelorus and Kaituna catchments, which increased sedimentation.

RESPONSE

The Council is increasing its investigations into the sources of sediment to try and reverse the trend allowing the estuary system to flush itself out. Core samples from the seabed will help scientists understand where the sediment has come from over time, what caused it and whether we can change land use practices to reduce the build-up of mud.

The Council is expanding monitoring within the estuary and surrounding catchments, working with land users and the community to increase awareness about the health of the estuary. Discharges are monitored by resource consent holders to check whether they are meeting the conditions of their resource consent.

Regular water quality monitoring is not carried out in the estuary because nutrient and bacteria levels can fluctuate quickly due to wind, tide, river flows, rainfall and temperature. Continuously recording data would be an effective way to monitor water quality, but the equipment is expensive to buy and maintain.

STATE

The estuary has 203 hectares of ecologically important saltmarsh and 15 hectares of seagrass beds. The area of saltmarsh has stayed much the same since 2001 and continues to provide an important habitat for invertebrates and fish and a place for wading birds to hide and feed.

About 75% of the estuary contains a large amount of soft mud, which means the estuary is receiving too much sediment from the rivers. Soft muds increased from 168 hectares in 2001 to 202 hectares in 2014. Shellfish such as pipis and cockles are lost as fine sediments increase, while beds of the non-native Pacific oyster expand.

The increase in mud is a sign that the estuary is under stress from farming, forestry and sediment washed down in storms. Sediment, nutrients and faecal bacteria reduce water clarity and quality. Meanwhile, the seagrass beds shrink under the fine sediments and phytoplankton production, marine invertebrates and fish suffer.

On a more positive note, very low levels of heavy metals, organic contaminants and nutrients were detected at the fine-scale survey sites. Apart from having more mud, the sites sampled in 2001 and 2014 remained the same.

Wairau Lagoon

Disease risk

Bacterial contamination in estuaries is caused by stormwater, sewage and run-off from agricultural land. These pathogens are a risk to shellfish and humans and have the potential to close beaches and stop commercial seafood harvesting.

WANT TO FIND OUT MORE?

- www.marlborough.govt.nz/Environment/Coastal/Coastal-Ecosystems/Estuaries.aspx
- Stevens, L; Robertson B,. Havelock Estuary 2014: Broad scale habitat mapping.
- Robertson, B.P. and Robertson, B.M. 2014. Havelock Estuary. Fine Scale Monitoring 2013/14.
- www.marlborough.govt.nz/Environment/Coastal/Coastal-Ecosystems/Significant-Marine-Sites.aspx
- Davidson, R; Duffy, C; Gaze, P; Baxter, A; Du-Fresne, S; Courtney, S; Hamill, P. 2011. Ecologically Significant Marine Sites in Marlborough, New Zealand. Marlborough District Council and Department of Conservation.

Habitat loss

Estuaries provide a wide range of habitats including shellfish beds, seagrass areas, beaches, river mouths, rocky shores, sand, silt, mud and saltmarsh, with pasture, native forest and shrublands around the margins.

Different habitats support a variety of species, but these are threatened by excessive mud, land reclamation and drainage works. Rising sea levels add to the uncertainty for estuary habitats.

RESPONSE

The Council takes a multi-pronged approach to managing pressures on estuaries. It carries out research and works with landowners to develop best practice on issues such as sedimentation and nutrient run-off and enforces compliance if consent conditions are not met.

There is regular monitoring of most estuaries in Marlborough.

There are two methods for studying estuaries: broad-scale habitat mapping monitors vegetation, sedimentation, invasive species and the growth of seaweeds from high nutrient loads. Fine-scale benthic surveys look at the species and abundance of life on the seabed as well as the presence of heavy metals and other contaminants.

By combining these methods the Council can track the health of each estuary over time. This information helps the Council and community understand and manage the effects of land-use within the estuary's catchment.

STATE

The condition of Marlborough's estuaries is not well-understood. The coastal science and monitoring programme began collecting data on estuaries in 2011. This information will improve our understanding of how different pressures are influencing estuary health.

A study at Okiwa and Ngakuta Bays showed the estuaries were relatively healthy, with a good amount of seagrass habitat. However, there were several less favourable findings, including a high proportion of mud habitats in Okiwa Bay and fungal disease on some seagrass.

The Havelock Estuary was found to be in a "moderate" condition when monitored in 2014, although mud areas had increased by 34 hectares since 2001 (see case study).

FUTURE RESPONSES

The Council aims to prevent further increases in mud and loss of habitat in the Havelock Estuary and to improve the condition of the estuary over time.

Council will monitor all estuaries over the next ten years.

Havelock Estuary.

COASTAL MARINE STRUCTURES

The region's coastal marine area, particularly the Marlborough Sounds, attracts many people and activities, including recreation, tourism, fishing, aquaculture and inter-island shipping. These activities all involve coastal structures such as boatsheds, jetties, moorings and marine farms, which must be managed to allow the safe and enjoyable use of the water space.

PRESSURE

The different activities within Marlborough's coastal environment are not always compatible with each other, especially when structures stop others from using the public water space. Marine farms, foreshore structures and moorings, together or on their own, can also affect the visual appeal, recreational enjoyment or navigational safety of an area.

CHANGES SINCE THE 2008 SOE REPORT

Marine farming

- There was a moratorium on new marine farming in the Sounds until new laws came into force on 1 October 2011. Between 2011 and 2015, the Council approved 41 applications for new aquaculture space covering about 130 hectares. Most of this new space involved extending the farms that were already there. The New Zealand King Salmon application to the EPA in 2011 resulted in three new sites for salmon farming, covering about 50 ha of water space (see Aquaculture chapter).

Foreshore structures

- Since 2008, 85 new coastal marine structures have been approved within the Marlborough Sounds. Council has also granted 1,300 replacement or additional structures.

Moorings

- Council has granted resource consents for 354 new moorings and replacement consents for 3,000 existing moorings.

Mistletoe Bay jetty

RESPONSE

The Council manages these pressures through regulations set out in the Resource Management Act, the Maritime Transport Act and local bylaws. The RMA documents include the New Zealand Coastal Policy Statement, the Marlborough Regional Policy Statement and the Marlborough Sounds and Wairau/Awatere Resource Management Plans, which set out objectives and policies for our coastal environment.

All marine farms, foreshore structures and moorings require resource consent from the Council. During the consent process the Council considers the effects on the environment and the objectives and policies in the Plan to help decide whether to allow the application.

If the application is successful, the Council grants a coastal permit. There are about 5,700 active coastal permits for marine farms, foreshore structures and moorings in Marlborough.

STATE

Marine farming

Marlborough produces 70 % of New Zealand's green-lip mussels and king (chinook) salmon. There are about 575 mussel farms, covering about 2,500 ha and six operational salmon farms in the Marlborough Sounds. Council monitors mussel farms to check that the lines and navigational lighting comply with the coastal permit. Salmon farms are monitored for their effects on the environment (see Aquaculture chapter).

Mussel farm Marlborough Sounds

Boatshed

Foreshore structures

There are about 1,300 foreshore structures in Marlborough, including jetties, boatsheds, launching ramps and seawalls. These are monitored for compliance just after they are built and later only if there is a complaint. Coastal permits have an expiry date and the structure is assessed again when the owner applies for a new coastal permit.

Moorings

There are about 3,000 boat moorings in Marlborough, most of them associated with holiday houses or permanent homes in the Sounds. Permit holders are required to have their mooring checked and maintained every two years to ensure it is safe and still in the consented position. Council also checks a mooring if there has been a complaint. Restrictions are put on moorings to prevent damage in certain areas, such as bays with sensitive seabed habitats.

FUTURE RESPONSE

Marlborough's new Regional Policy Statement and Coastal Plan were formally notified by Council in late 2015. They include a more comprehensive policy framework to help make decisions about allocating water space for marine farming, foreshore structures and moorings.

Mooring Management Areas may be established in certain bays to manage competing interests and use the water space efficiently. This will be done through a bylaw or resource consent process.

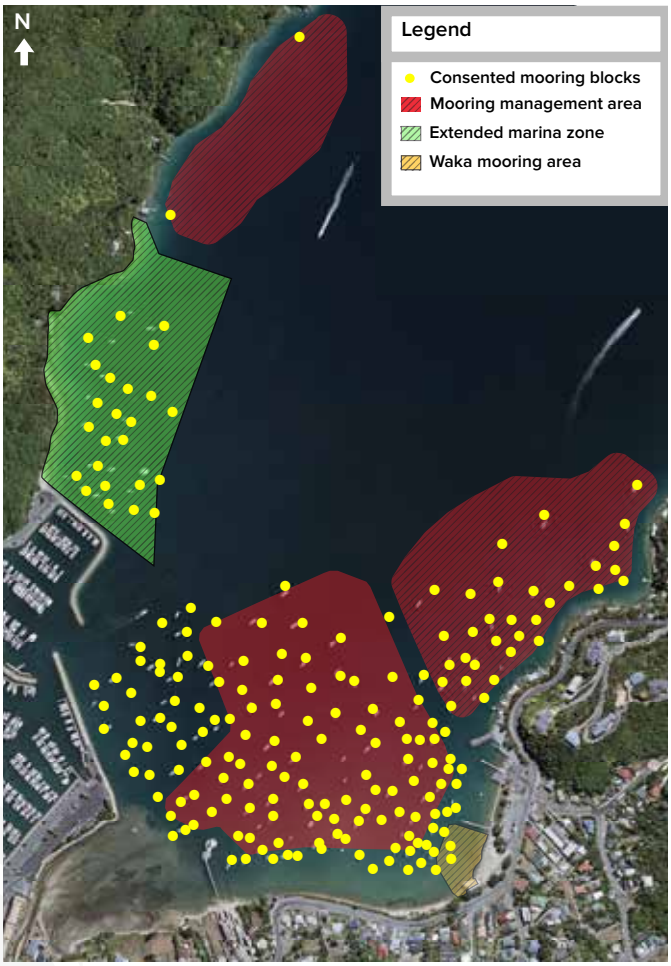


Figure 1: Mooring locations in relation to the approved Mooring Management Areas

CASE STUDY
Waikawa Bay moorings

Waikawa Bay covers 230 hectares of water space east of Picton and is a hub for boaties using the Queen Charlotte Sound / Totaranui. Waikawa has the largest marina in the South Island and demand for space continues to grow. Mooring Management Areas may be the answer (Figure 1).

PRESSURE

As well as the 600-berth Waikawa Marina, there is significant demand for swing moorings to park boats on the water at the head of Waikawa Bay. Between 2004 and 2007, Council received resource consent applications for 186 swing moorings in this area.

RESPONSE

A public hearing of the mooring applications in 2008 was adjourned to come up with a bay-wide solution to the need for more space. For the next two years, Waikawa mooring owners, bay users, manawhenua, Council and Port Marlborough explored possible solutions and agreed upon Mooring Management Areas. These create clear boundaries for where moorings may be located under Plan Change 21 of the Marlborough Sounds Resource Management Plan.

STATE

In 2011 Council granted all but one of the 186 moorings applied for at the head of Waikawa Bay. Consents were for five or ten years, depending on whether the mooring was inside or outside an identified Mooring Management Area (Figure 1).

FUTURE RESPONSE

If the final version of Plan Change 21 is approved by the Minister of Conservation, the Council, Port Marlborough and mooring owners will implement the Mooring Management Areas. Some moorings will be relocated to ensure all are within the management area boundaries.

If necessary, Mooring Management Areas can be changed with a bylaw to ensure effective and efficient use of the space.

WANT TO FIND OUT MORE?

- Marine farming and mooring maps: www.maps.marlborough.govt.nz/portal/
- The draft Mooring Management Bylaw: marlborough.govt.nz/Council-Publications/Plans-Policies-and-Documents
- Information on the plan change affecting Waikawa Bay and the related Mooring Management Areas: marlborough.govt.nz/Your-Council/RMA/Marlborough-Sounds-Resource-Management-Plan/Plan-Changes

SHIP WAKE EFFECTS

The Marlborough Sounds are part of a nationally important transport route that connects the North and South Islands. For the past 50 years the Interislander ferries have provided regular services between Picton and Wellington, joined later by Strait Shipping.

As ferry size and design has changed, there have been impacts on recreational safety, shoreline erosion and ecology in the Queen Charlotte Sound / Totaranui. The introduction of fast ferries in 1994 reduced the journey time across Cook Strait, but their larger and more powerful waves damaged beaches and tidal habitats and put public safety at risk.

Responding to public concern in 2000 the Council introduced a bylaw that slowed the fast ferries down to the same speed as the conventional ferries - 18 knots in the Sounds. The fast ferries stopped running in 2005, but the by-law remains and the Council continues to monitor ship wake. As older ferries are replaced, the impact of new vessels needs to be monitored.

PRESSURE

Ferry wake creates erosion and sedimentation that may change the shoreline and disturb habitats in the inter and sub-tidal areas. These impacts may cause species to be reduced or lost.

CHANGES SINCE THE 2008 SOE REPORT

- The speed bylaw remains in place and five complaints have been received about breaches of the 18 knot limit. Several different ferries have been introduced to the route, particularly over the summer of 2014/15. Monitoring has not been carried out since these changes, but the Council does not expect significant changes to the environment.

Ferries operate between Picton and Wellington

RESPONSE

In 1994 the Council began monitoring shoreline profiles at 21 locations in Queen Charlotte Sound / Totaranui and Tory Channel (Figure 1). This was done every six months until November 2013, when monitoring was changed to once every two years. All cross-sections of shore profiles have been measured, photographed and analysed by an independent scientist.

BlueBridge Ferry Entering Tory Channel

Cook Strait ferries cross at Karaka Point

Fast ferry ship wake

Monitoring of cobble-shore invertebrates started in 1995 (Figure 1) and bedrock shore invertebrates were added in 2000. The sites have been monitored at least once a year up to 2013 and will be monitored every two years from 2015.

WANT TO FIND OUT MORE?

marlborough.govt.nz/Environment/Coastal/Monitoring-Research/Ship-Wake-Monitoring.aspx

STATE

After 15 years of biological measurements, inter and sub-tidal habitats have recovered much of their species diversity and abundance. However, following the introduction of the Kaitaki Ferry in 2005, some inter-tidal habitats declined. This suggests that wash from conventional ferries also affects the ecology, though not as severely as fast ferries.

A 2012 report on shoreline dynamics showed there has been a change to beach profiles in Tory Channel and Queen Charlotte Sound / Totaranui since the speed limit was introduced. Some sites are relatively stable with a balance achieved between erosion and accretion (building up the shore). At other sites erosion has slowed or stopped and sediment is no longer building up rapidly at the top of beaches.

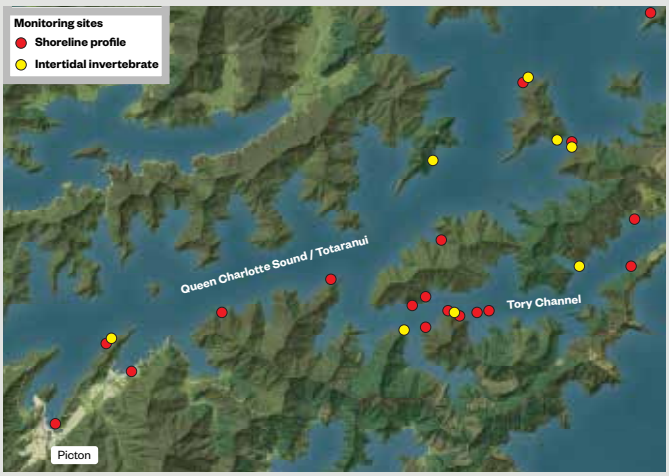


Figure 1: Ship wake monitoring sites

OIL SPILL RESPONSE

The Marlborough Sounds has an international reputation as an area of great beauty that many people enjoy for recreation or rely on for a living. However, the increasing number of cruise liners, logging ships, aquaculture vessels and recreational boats pose a threat to this special environment.

PRESSURE

Many bays in the Sounds are at risk of damage by oil pollutants through negligence, ignorance or accident. Something as simple as a bilge discharge can result in an oil slick covering a significant area; for example, a cup of diesel may result in a slick the size of an Olympic swimming pool.

Spills at refuelling points can happen through inattention or airlocks. Although these spills may appear minor at the time it is the cumulative effect of many such spills that has an adverse impact on the environment. For example, a spot of oil the size of a pin-head is likely to render a seabird egg infertile. The outer reaches of the Marlborough Sounds and the shorelines along Cook Strait are at risk from oil pollutants from international ships that travel through the strait on the way from South America to Australia.

There is also a potential risk from deep sea oil drilling, with new prospecting areas opening up off D'Urville Island and Admiralty Bay being used as an oil rig loading base for the Taranaki oil fields.

Drilling rig on-load - Admiralty Bay

CHANGES SINCE THE 2008 SOE REPORT

- Review of Oil Spill Strategy has been undertaken.
- All marine oil transfer sites have spill plans in place.


Equipment training Shelly Beach

RESPONSE

Marlborough's Oil Spill Strategy places a responsibility on all those supplying or buying fuel to respond and clean up any spills. Marine fuelling stations in the Sounds must have a contingency plan for dealing with any spills. In its most basic form, this includes instructions and a "spill kit" with absorbent booms and pads. At a boatie level, it is essential to be aware and prevent any possibility of fuel leaking overboard. For example, a rag around the nozzle where fuel enters the tank may prevent small spills into the sea.

For larger or more complex spills, the Council has a well-established and tested oil spill contingency plan and a range of response equipment. Where a spill is too large or becomes increasingly complex, Maritime New Zealand assumes control using national and, if necessary, international resources to combat the spill.

About 20 Marlborough residents have been trained by Maritime New Zealand to respond to a large oil spill in the district and are ready to help in other regions. They include staff from the Council, the Department of Conservation and Port Marlborough. This work is over and above their daily duties and their skills are maintained through regular oil spill exercises.

Figure 1: Number of notified oil spill incidents reported

STATE

All reported spills are investigated by Harbour Master staff who decide whether to launch a response. This may be as simple as agitating the area of a lighter oil spill to speed up natural evaporation or deploying specialist equipment to combat heavier fuel spills. There are five marine oil transfer sites in Marlborough and each one has an oil spill response plan in place.

FUTURE RESPONSE

A team of trained response staff from the Council and Port Marlborough plus other personnel complete exercises several times a year to maintain their skills.

Oil Spill equipment training exercise