



Our marine environment 2019 Summary

New Zealand's Environmental Reporting Series



Ministry for the
Environment
Manatū Mō Te Taiao

Stats^{NZ}
Tatauranga Aotearoa

Our marine environment at a glance

Te moana, the coast and oceans of Aotearoa New Zealand, are central to our identity and intertwined with our history – we are a maritime nation. For Māori, te moana is a source of whakapapa.

We have one of the largest areas of ocean in the world. Our marine landscapes and habitats are diverse, supporting complex ecosystems and many unique species.

Our oceans support us:

- ▶ Healthy marine ecosystems provide essential benefits like taking up carbon dioxide, removing pollutants, and providing kaimoana.
- ▶ In te ao Māori (the Māori world and worldview) the mauri, or life force, of a healthy moana enhances the mauri of those who interact with it.
- ▶ The marine economy added \$7 billion to our economy in 2017 and employed more than 30,000 people.

Our *marine environment 2019* report summarises four priority issues for the marine environment.



While some of the impacts of individual activities on the marine environment are obvious, it is the cumulative effect of many pressures that could present the biggest issues.

ISSUE 1

▶ Our native marine species and habitats are under threat

There has been a decline in biodiversity, and habitat condition and extent, as a consequence of our activities.

- ▶ An estimated 30 percent of Aotearoa New Zealand's biodiversity is in the sea but many species and habitats are in trouble. Very few marine species are assessed, but of these 22 percent of marine mammals, 90 percent of seabirds, and 80 percent of shorebirds are threatened with, or at risk of, extinction.
- ▶ The number of identified, non-native marine species established here is rising and now totals 214. Many non-native species can spread rapidly and some affect native species and habitats.
- ▶ Estuaries and habitats provide marine life with the food and shelter they need to thrive. Some plants and animals, like seagrass or shellfish, create new habitats and support other species. Many of these are decreasing or under threat.

Habitat decline

A decline in the number of kuku (green-lipped mussel), from over 100 million in 2007 to less than 500,000 in 2016, was observed in Ōhiwa Harbour.

WHY THIS MATTERS

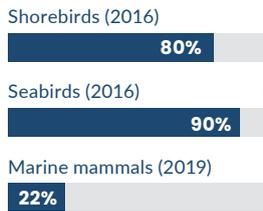
Declining marine health makes our coasts and oceans less resilient to disturbances, including climate change.

► The complexity of our marine environment

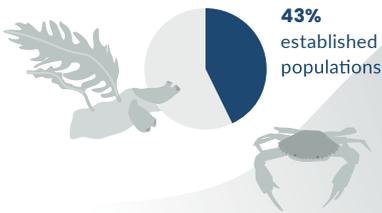
Our marine environment is vast, diverse, and complex. It is impacted by our activities both on land and at sea. Here are some examples of the impacts from our activities.

Issue 1: Our native marine species and habitats are under threat

Marine species threatened with or at risk of extinction



An increasing number of non-native species detected, 2010-2017



Issue 4: Climate change is affecting marine ecosystems, taonga species, and us

+2.44 mm

Average rate of sea-level rise per year between 1961 and 2018.



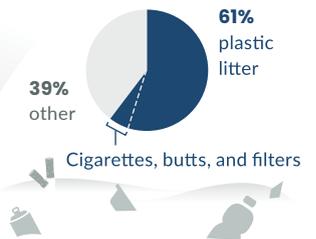
+0.2 °C

Average temperature increase per decade in New Zealand's coastal waters.



Issue 2: Our activities on land are polluting our marine environment

Beach litter in New Zealand



Up to 200x

Increase of average annual sedimentation rates and variability in Waikato since Europeans arrived.

Issue 3: Our activities at sea are affecting the marine environment

>99%

The amount of New Zealand imports and exports transported by sea.



335,812 km²

The total trawled area in deepwater fisheries (1990-2016).



Issues interact and have cumulative effects on our marine environment

Our exclusive economic zone is one of the largest in the world

EEZ boundary (Exclusive Economic Zone)

Follow the kuku story through the issues identified in the report.

ISSUE 2

► Our activities on land are polluting our marine environment

Our activities on land, especially agriculture and forestry, and growing cities, increase the amount of sediment, nutrients, chemicals, and plastics that enter our coasts and oceans.

- Inter-tidal sedimentation rates have generally increased and become highly variable since European settlement. Thick deposits of sediment can smother animals and degrade habitats.

Sediment accumulation

In estuaries and harbours across the Waikato region, historical sediment accumulation rates were less than 0.5 millimetres per year. After European settlement, rates became unstable, reaching almost 200 times historical rates.

- Coastal water quality is variable. It is generally improving at a national level, but is very site dependent.
- Some pollutants, like pharmaceuticals and cleaning products, end up in the marine environment and the impacts of this are not well understood.
- Plastic is found throughout the ocean including inside shellfish, fish, and birds. Seabirds and other animals that eat plastic can get sick or die.
- Citizen science data collected at 44 sites showed more than 60 percent of beach litter was plastic.

WHY THIS MATTERS

Pollution affects our ability to harvest kaimoana, swim, and fish in our favourite local places.

ISSUE 3

► Our activities at sea are affecting the marine environment

Our activities on coasts and in oceans, like fishing and aquaculture, shipping, and coastal development, provide value to our economy and support growth.

- Since 2009, the total commercial catch has remained stable at less than 450,000 tonnes per year.
- In 2018, 84 percent of routinely assessed stocks were considered to be fished within safe limits, an improvement from 81 percent in 2009. Of the 16 percent that were considered overfished, 9 stocks were collapsed.
- Fishing has long-term and wide-ranging effects on species and habitats.
- Seabed trawling and dredging have decreased in the last 20 years. About 24 percent of the fishable area has been trawled since 1990. Shallow areas are trawled more extensively than deeper areas, with varying impacts depending on fishing intensity, gear type, and vulnerability of habitat.
- As an island nation, 99.5 percent of our imports and exports move by sea, and shipping traffic and vessel size has increased.
- Boat traffic is associated with the spread of non-native species and pollution and requires further construction of wharves and coastal infrastructure.

Bycatch

The accidental capture (bycatch) of seabirds and marine mammals is decreasing but remains a significant pressure on some populations. Seabird deaths in the 2016/17 fishing year were estimated at 4,186.

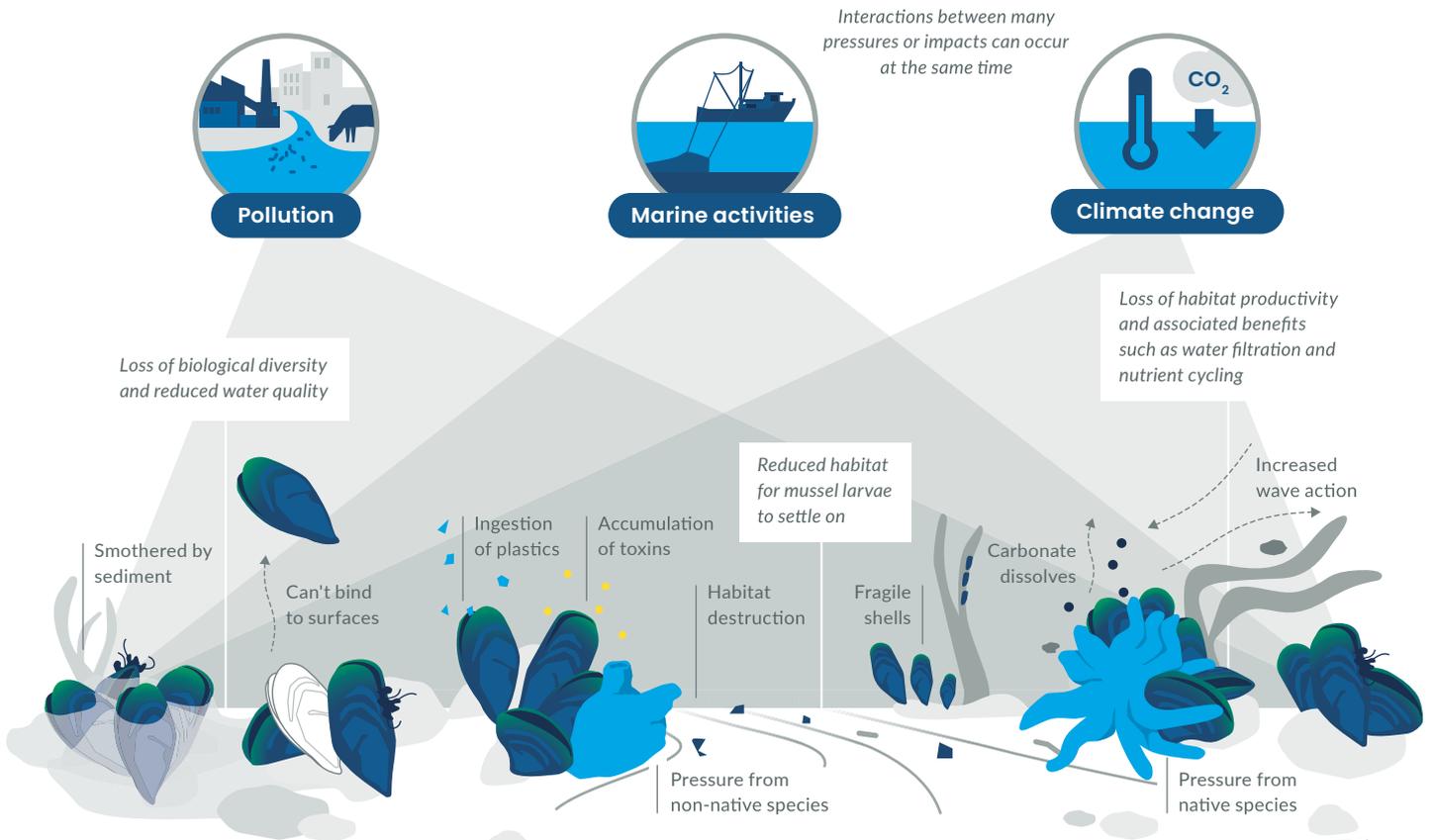
WHY THIS MATTERS

Most of our activities in the marine environment tend to increase in intensity towards the coast. On top of the pressure from coastal development, this results in coastal environments being most impacted. Coastal waters tend to hold the greatest diversity of species.

► All pressures that affect kuku (green-lipped mussel)

Most of our impacts in the sea and many on land have impacts on kuku that overlap and interact, resulting in cumulative effects.

PRESSURES ON KUKU



The interactions between past and current pressures have had long-lasting impacts on kuku. The resulting cumulative effects, in combination with future pressures, are variable across Aotearoa and are hard to predict.

THE BENEFITS OF HEALTHY, DENSE KUKU BEDS ARE BEING DEGRADED OR LOST

Dense kuku beds:

Provide economic and income gain

Provide homes and food for other marine animals and plants

Improve water quality for swimming and harvesting shellfish

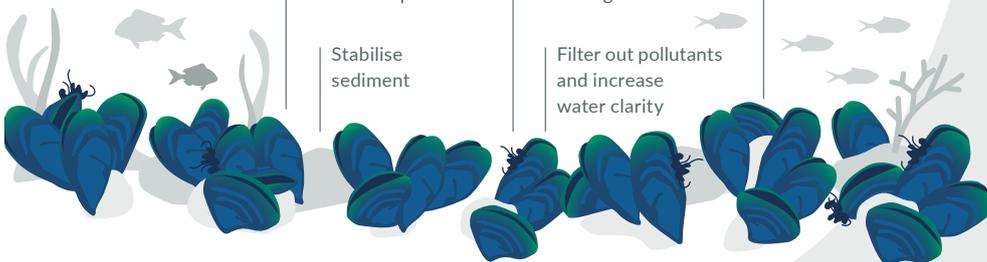
Support fish population and fisheries

Stabilise sediment

Filter out pollutants and increase water clarity

IMPACT ON OUR VALUES

Loss of benefits and biodiversity erodes mauri and takes away opportunities to express kaitiakitanga, put kai moana on the table, and share intergenerational knowledge.



ISSUE 4

► Climate change is affecting marine ecosystems, taonga species, and us

Global concentrations of atmospheric greenhouse gas are increasing because of activities like burning fossil fuels for heat, transport, and electricity generation. This is causing unprecedented change in our oceans.

- The rate of sea-level rise has increased. The average rate in the past 60 years (2.44 millimetres per year) was more than double the rate of the previous 60 years (1.22 millimetres per year). Recent data suggests an even faster rate of sea-level rise.
- Extreme wave events may be becoming more frequent.
- Satellite data recorded an average increase of 0.2° Celsius per decade for coastal sea-surface temperature since 1981. Years with an average temperature above the long-term average are more frequent.
- Tohu (environmental indicators that identify trends in the natural world) have changed.
- Long-term measurements off the Otago coast show an increase of 7.1 percent in ocean acidity in the past 20 years. Oceans will continue to become more acidic as more carbon dioxide is absorbed.
- Shellfish, including oysters, pāua and mussels, are vulnerable to increasing ocean acidity and this poses a risk for the shellfish-farming industry.

Marine heatwaves

An unprecedented marine heatwave occurred in the Tasman Sea and near the Chatham Islands from November 2017 to February 2018 during our hottest summer on record.

WHY THIS MATTERS

Warmer seas affect the growth of even the smallest things in the ocean like plankton which can impact the whole food web. Some temperature-related changes in individual species and fish communities have been observed.

Roads, bridges, coastal communities, and habitats are at risk from flooding and sea-level rise.

► Issues are not isolated, but build on each other and cause more harm

The pressures associated with biodiversity loss, our activities on land and at sea, and climate change have interacting effects on coasts and oceans.

- This cumulative effect is one of the most urgent problems we face in our oceans.
- Given the complexity of the marine environment and lack of long-term data, the nature of cumulative effects is difficult to predict.



This report looks at the individual and cumulative pressures on kuku (as shown in the infographic on previous page). This is illustrative only and helps to build a picture of what the messages in *Our marine environment 2019* mean within the context of a single species.

WORKING TOGETHER

The ability to report on the impacts of changes on species and habitats in the marine environment is often limited by a lack of baseline data, understanding of tipping points, and connections between domains.

Working together across mātauranga Māori and other science disciplines is improving our holistic, place-based knowledge that is crucial in understanding cumulative effects.

For Māori, the whenua and moana are inextricably linked and there is a complement or balance for everything on land in the oceans.