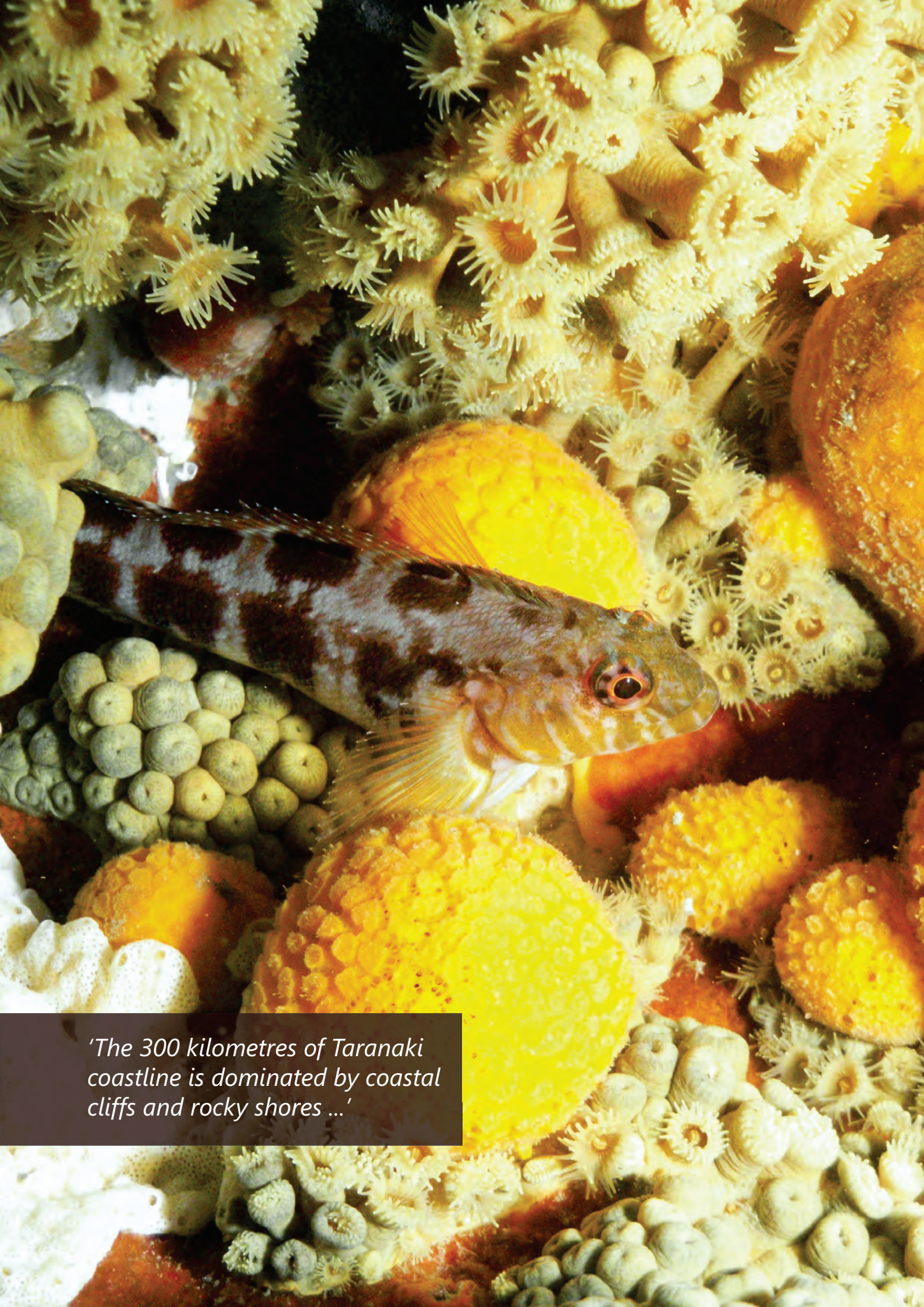


'The 300 kilometres of Taranaki coastline is dominated by coastal cliffs and rocky shores ...'

Coastal and marine biodiversity

The Taranaki coastline is rugged and exposed, and its marine habitats include intertidal and subtidal reefs, estuaries and mudflats, coastal cliffs, sandy beaches and dune systems. The region's coastal waters are home to a range of species, including the critically threatened Māui dolphin. Human activities and natural processes both impact on coastal and marine biodiversity in the region to varying degrees, depending on particular zones and habitats.

The Council undertakes representative monitoring of intertidal communities and coastal dune vegetation and some marine pest control. With relatively few marine pests currently in Taranaki's waters, it is important to prevent the spread of invasive species into the region. The organisations with main responsibility for marine pests are DOC and the Ministry for Primary Industries (MPI). As part of their surveillance programmes, MPI and NIWA survey Port Taranaki twice a year for foreign marine organisms that could threaten the marine environment.

Other aspects of biodiversity are managed by a number of other agencies, including DOC and MPI.

Coastal habitats on land

The 300 kilometres of Taranaki coastline is dominated by coastal cliffs and rocky shores. There are also smaller areas of sand dunes and estuaries. The coastal cliffs and dune systems support many of the region's threatened and uncommon species, including rare and fragile plant communities. Coastal habitats in Taranaki are vulnerable to many natural processes that can occur on an exposed and rugged coast, and in places they have also suffered as a result of vegetation clearance, erosion and development.

What's the story?

As at 2011, there were an estimated 15,669 hectares of sand dunes in Taranaki, including coastal beaches and uplifted areas above coastal cliffs. Almost 12,000 hectares or 76% of these dunes are used for agriculture or horticulture. Less than 2,000 hectares (12%) are still considered indigenous or partially modified. Nationally, patterns are similar. Estimates in 2003 determined that only 11.6% of New Zealand's sand dunes had retained some degree of natural character.

In terms of coastal birdlife, 19 species of seabird are known to use the protected islands and waters around Ngāmotu or the Sugar Loaf Islands, off New Plymouth. Taranaki has one confirmed mainland breeding colony of grey-faced petrels, the southern-most known mainland breeding site in New Zealand. Little blue penguins, the smallest penguins in the world, are nationally considered at-risk/declining and nest along accessible parts of Taranaki's coastline. Breeding attempts have been recorded for the threatened New Zealand dotterel on the dunes around Sandy Bay.

Rare and threatened coastal herb fields grow along the cliffs of South Taranaki. They are home to threatened local species such as the regionally distinctive coastal herb *Limosella* or 'Manutahi' and the endemic day-flying moth *Notreas* or 'Taranaki'. Natural coastal dune systems in Taranaki, which are rare, support at-risk coastal dune plants, such as pīngao.

New Zealand dotterel.

Rocky reef communities

The diversity of intertidal communities at different reefs around Taranaki depends on a range of largely natural factors including substrate stability, exposure to waves and sand cover. Taranaki's intertidal area is dominated by rocky reefs that provide a wide range of habitats and ecological niches. Some organisms are adapted to living on top of boulders, able to endure extreme temperature ranges, exposure to waves and the risk of drying out. However, the undersides of boulders offer a more stable habitat less prone to these extremes and as a result, more diverse communities can be found here.

The results of the Council's monitoring of intertidal rocky reef sites, including the effects of sand accumulation, are discussed in Chapter 4—Coast. The biodiversity of species in intertidal rocky reef habitats is discussed here.

What's the story?

The dominant fauna found on the surface of reef boulders include snails, limpets, barnacles and tube worms. These organisms are well adapted to the fluctuating extremes of their environment.

Under-boulder communities are relatively diverse across Taranaki's intertidal region. Communities include at least four species of anemone, eight species of chiton, six species of nudibranch and five species of starfish.

Coralline turf is the dominant seaweed cover at the majority of Council rocky shore sites, which are located between the mid and low-shore. This hardy algae is relatively resistant to sand cover and provides valuable habitat for juvenile cat's eyes (*Turbo smaragdus*).

*Juvenile cat's eyes (*Turbo smaragdus*) begin their journey within the hardy coralline turf before moving further down shore at about 18 months old.*

Natural sand accumulation impacts the diversity of intertidal communities in Taranaki. One of the more sand tolerant species in the region is the colonial tube worm *Neosabellaria kaiparaensis*. This tube worm thrives in sand rich environments, such as the Orapa Reef, and can dominate as a species, preventing other rock dwelling organisms from colonising the area. The impact of sand accumulation on rocky shore diversity is discussed in Chapter 4—Coast.

The stability of the substrate also impacts on the diversity of intertidal communities in Taranaki. For example, on parts of the Waiwhakaiho Reef, encrusting organisms struggle to settle on the moving cobble. As a result, diversity is low and the community is dominated by the half crab (*Petrolisthes elongatus*), which is able to scuttle and filter-feed between the rounded cobbles.

Typically in Taranaki, the areas of intertidal reef with the most diverse communities have a range of stable habitats with minimal sand accumulation. At such reefs, for example Mānihi Road Reef, the mean number of species can exceed 20 per 0.25 m^2 quadrat.

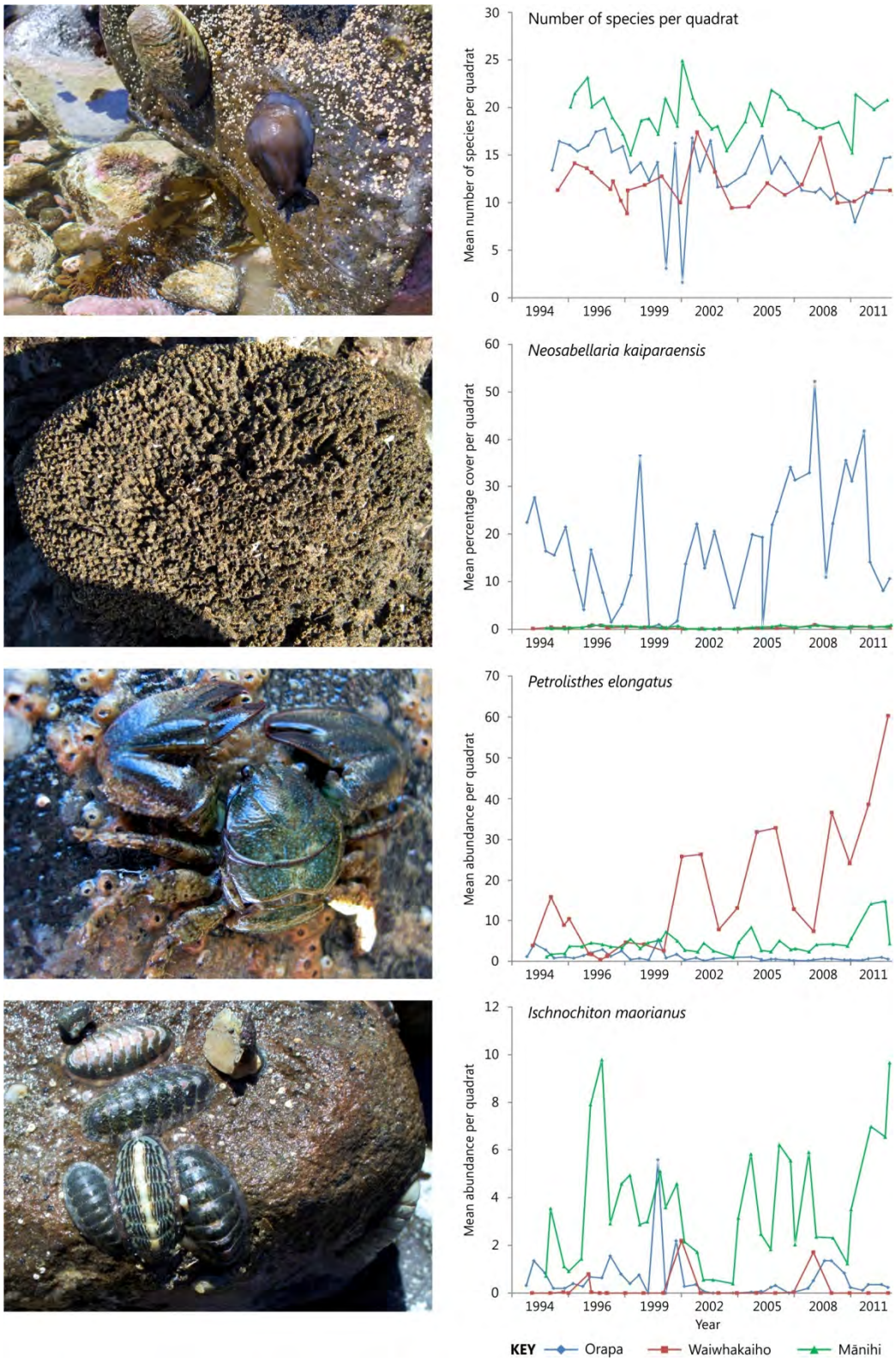
Find out more

Morton, J. (2004) Seashore ecology of New Zealand and the Pacific.

Paulin, C. and Ryan, P. (2014) Taranaki's Rocky Shore.

Walsby, J.R. (1977) Population variables in the grazing turbinid Lunella smaragda (Mollusca: Gastropoda). New Zealand Journal of Marine and Freshwater Research, 11:2, 211-238

Rocky shore ecology state of the environment monitoring report (TRC)



Examples of diverse rocky reef communities include sea slugs Scutus breviculus *and pāua* Haliotis iris *(top). The colonial tube worm* Neosabellaria kaiparaensis *(second from top) is tolerant of high sand accumulation typical of the Orapa Reef; the half crab* Petrolisthes elongatus *(third from top) is well adapted to shifting cobble substrate such as that of the Waiwhakaiho Reef and the variable chiton,* Ischnochiton maorianus *(bottom) requires stable under-boulder habitat, such as that of the Mānihi Road Reef.*

Colourful marine molluscs found around the Taranaki coastline include (clockwise from top left) common New Zealand octopus Pinnoctopus cordiformis*; seaslug* Alloiodoris lanuginata; *chiton* Notoplax violacea*; seaslug* Archidoris wellingtonensis*; pāua* Haliotis iris*; and seaslug,*Tularia bractea.

Council scientists collect samples from the soft sediments of the estuary.

Estuarine communities

Although we do not monitor water quality in the region's estuaries, it is generally understood that water quality is good and that biodiversity in Taranaki's estuaries is more impacted by natural processes than by other activities. The region's estuaries are well flushed with fresh water, making them a harsh environment for marine life. As a result, the number and diversity of fish and shellfish is low. Burrowing fauna such as worms, sand-hoppers, cockles and pipis, can survive these conditions and are a valuable food source for the juvenile fish and wading birds that take refuge in estuaries.

'Biodiversity in Taranaki's estuaries is more impacted by natural processes.'

In South Taranaki, the Waitōtara and Whenuakura rivers have been highly modified over time, with large areas of land being cleared for farming. They also drain mudstone catchments and frequently flood. This means that the level of silt is high in these rivers, a factor which reduces the number and diversity of species in the lower estuaries. The Tongaporutu and Mimi catchments in north Taranaki are not as extensively modified. The Council monitors communities annually at two estuaries—Tongaporutu and Waitōtara.

What's the story?

Typical of other estuaries in New Zealand, both the Tongaporutu and Waitōtara estuaries are dominated by sandhoppers, pipi, cockle, trough shells, marine bristle worms and mud snails.

In February 2004, severe flooding of the Waitōtara River led to significant silt movement in the catchment. As a result, very few marine organisms were detected in the April 2004 survey. Typically, estuarine communities recover from flooding and increase in number within a year, particularly sandhoppers. Between 2008 and 2014, the dramatic deviation seen in 2004 was not repeated. However, some years, such as 2009, exhibited dips in the number of organisms due to natural variations in sediment levels. For further information about New Zealand estuaries, see the NIWA research website.

Find out more

Estuaries—education material (NIWA website) tinyurl.com/TRC6v

'A clown nudibranch spotted in Parininihi marine reserve ...'

Protected areas

Within the Taranaki coastal marine area there are two marine reserves—Parininihi and Tapuae, established in 2006 and 2008, respectively. There is one marine protected area—Ngāmotu or the Sugar Loaf Islands Marine Protected Area, established in 1983. All reserves and marine protected areas are managed by DOC.

Ngāmotu/Sugar Loaf Islands

Just offshore of New Plymouth, Ngāmotu or the Sugar Loaf Islands are semi-sheltered—unique along a coastline that is generally very exposed. Subtidal marine habitats around these islands include spectacular canyons, caves, rock faces with crevices and overhangs, large pinnacles, boulder fields and extensive sand flats. Distinct from the rest of Cape Egmont, the sea stacks and islands provide the most firm and stable substrate on the Taranaki coast.

The Sugar Loaf Islands are important for 19 species of seabird, with approximately 10,000 seabirds nesting annually. There are also at least 89 species of fish, 33 species of encrusting sponges, 28 species of bryozoans and nine species of nudibranchs. In 1992, the first evidence of New Zealand fur seals breeding on the Sugar Loaf Islands was observed and they now host the largest New Zealand fur seal rookery on the west coast of the North Island.

Ngāmotu (the Sugar Loaf Islands) is a Marine Protected Area, established in 1983.

Parininihi Marine Reserve

The Parininihi Marine Reserve in the south-eastern reaches of the North Taranaki Bight comprises the Pariokariwa Reef and surrounding sand and mud areas. The reserve provides a home to a variety of fish species including the blue cod, blue moki, red moki, gurnard, John Dory, leatherjacket, kahawai, red cod, tarakihi, trevally and snapper. The reserve is also a valuable habitat for rock lobster. However, what makes it unique is its collection of rare and exotic sponges, which are spread in a vividly coloured carpet across the ledges of the Pariokariwa Reef.

Kina, or sea urchins, are found in Tapuae Marine Reserve.

Tapuae Marine Reserve

The Tapuae Marine Reserve adjoins Ngāmotu/Sugar Loaf Islands Marine Protected Area and is home to approximately 400 species of fish. Many fish species are associated with the reef areas of the Tapuae Marine Reserve, including triplefins, red moki, leatherjackets, butterfly perch, scarlet wrasse, spotty, blue cod and short-tailed stingray. Ocean species such as John Dory, kingfish, kahawai, gurnard, snapper, trevally and mullet are also commonly seen here. The Tapuae Marine Reserve is also home to a diverse range of invertebrates, including rock lobster, kina, sponges, molluscs and starfish. Killer, humpback, and southern right whales have all been observed within the reserve area.

Around 400 species of fish live in the waters of the Tapuae Marine Reserve.

DOC monitoring within protected areas

Between 2008 and 2014, DOC conducted two seasons of predatory fish monitoring in each marine reserve (Tapuae 2011 and 2013, Parininihi 2012 and 2014). Currently, there is still insufficient data to determine the effectiveness of the no-take areas on the marine communities living within and adjacent to the marine reserves.

Subtidal reefs

Some of Taranaki's subtidal reefs are considered 'areas of outstanding natural character'. These include the North and South Traps, two distinctive pinnacle reefs off the South Taranaki coast, and the Pariokariwa Reef, which lies within the Parininihi Marine Reserve.

The Pariokariwa Reef is internationally valued for its sponge garden. These dense assemblages cover about 75% of available reef surface and are among the densest and most diverse communities in New Zealand. A report by Battershill and Page (1996) provides evidence that, in terms of biodiversity values, sites on Pariokariwa Reef are important on a national and global level, with diversity comparable to sites in Antarctica.

Some of Taranaki's subtidal reefs are considered areas of outstanding natural character.

Find out more

Marine reserves and protected areas (DOC website) tinyurl.com/TRC6w

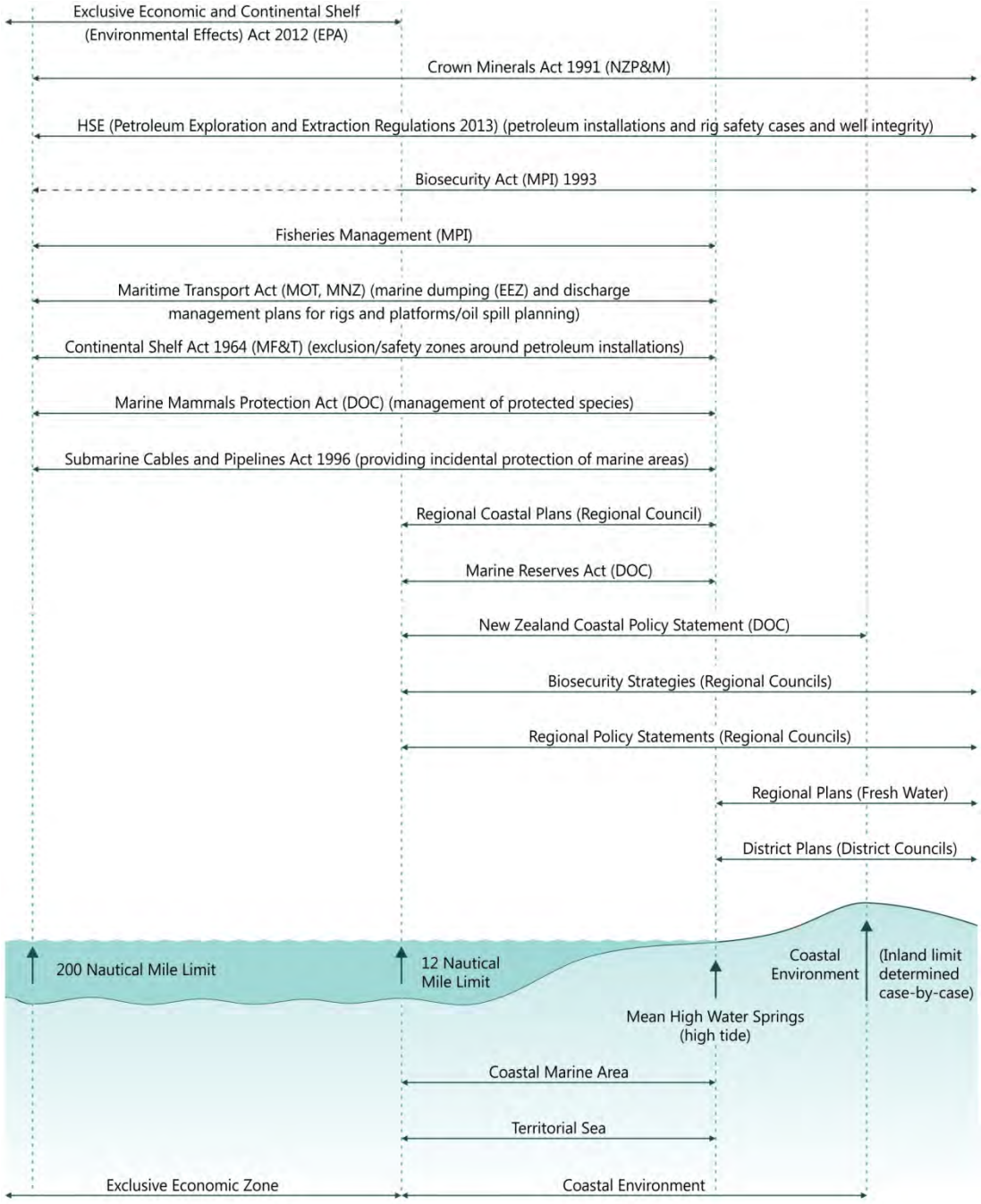
Ballantine, B. (2014) Fifty years on: Lessons from marine reserves in New Zealand and principles for a worldwide network. Biological Conservation, 176, 297-307

Battershill, C.N. and Page, M.J. (1996) Preliminary survey of Pariokariwa Reef North Taranaki. NIWA Report: 1996/10-WN, Prepared for Department of Conservation Wanganui

Our responses

Regional Coastal Plan for Taranaki

The *Regional Coastal Plan for Taranaki* was made operative in 2001 and contains objectives, policies and rules to manage Taranaki's coastal marine area sustainably is currently under review. These policies, methods and rules govern activities from the mean high water spring out to 12 nautical miles. A number of agencies have responsibility for the coastal and marine area of Taranaki:



A large number of agencies and organisations have jurisdiction in various aspects of coastal marine management.

Grey-faced petrel.

CASE STUDY

Biodiversity buzz **benefits birds**

Grey-faced petrels (*Pterodroma gouldi*), or ōi, are native seabirds that frequent the coastal waters around New Zealand. Once widespread throughout the North Island, breeding colonies are now limited to offshore islands and a few scattered mainland sites, such as the one at Rapanui near Tongaporutu.

The Council's Biodiversity team works closely with the Rapanui Grey-Faced Petrel Trust, which is a small organisation achieving big results—and not only for the bird species whose habitat it cares for. Since the Trust erected a predator-proof fence a decade ago, bird numbers have increased at what is the region's only remaining mainland colony for grey-faced petrels—once an abundant species throughout Taranaki.

'The Council team is enthusiastic and that rubs off on everyone.'

Although not a threatened species, the petrels can pose challenges for those working to protect and enhance their breeding ground. Occasionally, for example, birds are caught short if nest burrows have not been finished and lay their eggs right at the entrance. And birds are not only nesting in the main colony, but also on a small cliff stack just off the mainland. Here, they can be heard being very active after dark.

The colony is classified as a Key Native Ecosystem and the Biodiversity team has assisted with pest plant control, pest animal control, and revegetation and enhancement planting. New plantings have included the at-risk and vulnerable coastal plant species *Euphorbia glauca*, or sea spurge, and *Hebe speciosa*, both grown especially for the Council by Moturoa School pupils in their propagation unit. Hollard Gardens has also grown plants for the colony. During 2011/2012, the Rapanui Grey-Faced Petrel Trust also made significant improvements at both ends of the predator-proof fence, near the cliff face. This was made possible with a Biodiversity Condition Fund grant obtained through the Council.

Trustee Evan Lobb, who owns the land where the colony is sited, is delighted with progress. "Having the Biodiversity team on board means a lot to a small group like ours, and between us all we've really upped the ante over the past year," he says. "The Council team is enthusiastic as well as knowledgeable, and that rubs off on everyone."

The respect is mutual, with Biodiversity team members saying they are motivated by the work put in by trustees.

A Council Environment Officer makes the finishing touches on a trial nesting box at Rapanui.

Biosecurity

Multiple agencies or organisations have responsibility for marine biosecurity, with MPI and DOC being the key parties. The Regional Council has limited functions in marine biosecurity.

Two pest seaweed species have been found in Port Taranaki: the Japanese seaweed Undaria (*Undaria pinnatifida)* and the red algae *Grateloupia turutu*. Of these, *Undaria pinnatifida* is currently listed in the Council's *Pest Management Strategy for Taranaki: Plants*.

During winter or early spring of each year, the Council works with DOC and Port Taranaki Limited to remove *Undaria* from around the wharves and pontoons on the Lee Breakwater. This is when the individual plants are large enough to be easily identified and are not releasing many spores. Typically, spores are released later in the spring.

The algae *Grateloupia turutu* is difficult to distinguish from many native red algal species and there is currently no feasible or cost-effective option for control or eradication of this pest species.

The Council works with DOC and Port Taranaki Limited to remove Undaria *from structures around the breakwater.*

Information, education and advice

As part of implementing the *Regional Coastal Plan for Taranaki*, the Council provides advice and assistance to landowners and care groups to protect and enhance estuaries and the lower reaches of rivers that play an important role in the lifecycle of īnanga and whitebait species.

We also provide advice and assistance to landowners and care groups to protect and enhance sand dunes on private land.

The Marine Biosecurity Portal, jointly operated by MPI and NIWA, has information about marine pests and other non-indigenous marine organisms that have been recorded in New Zealand coastal and marine waters. The website provides information on ways to minimise the risk of marine pests and includes a project map comparing different ports across New Zealand.

Find out more

Inventory of coastal areas of local or regional significance in Taranaki (TRC) tinyurl.com/TRC6y

Marine Biosecurity Portal tinyurl.com/TRC6z

MPI Biosecurity Website tinyurl.com/TRC6aa

Regional Coastal Plan for Taranaki tinyurl.com/TRC6x

Taranaki Biodiversity Accord tinyurl.com/TRC6h

Ballantine, B. (2014). Biological Conservation, 176, 297-307

Ballantine, B. (2014) Fifty years on: Lessons from marine reserves in New Zealand and principles for a worldwide network. Biological Conservation, 176, 297-307