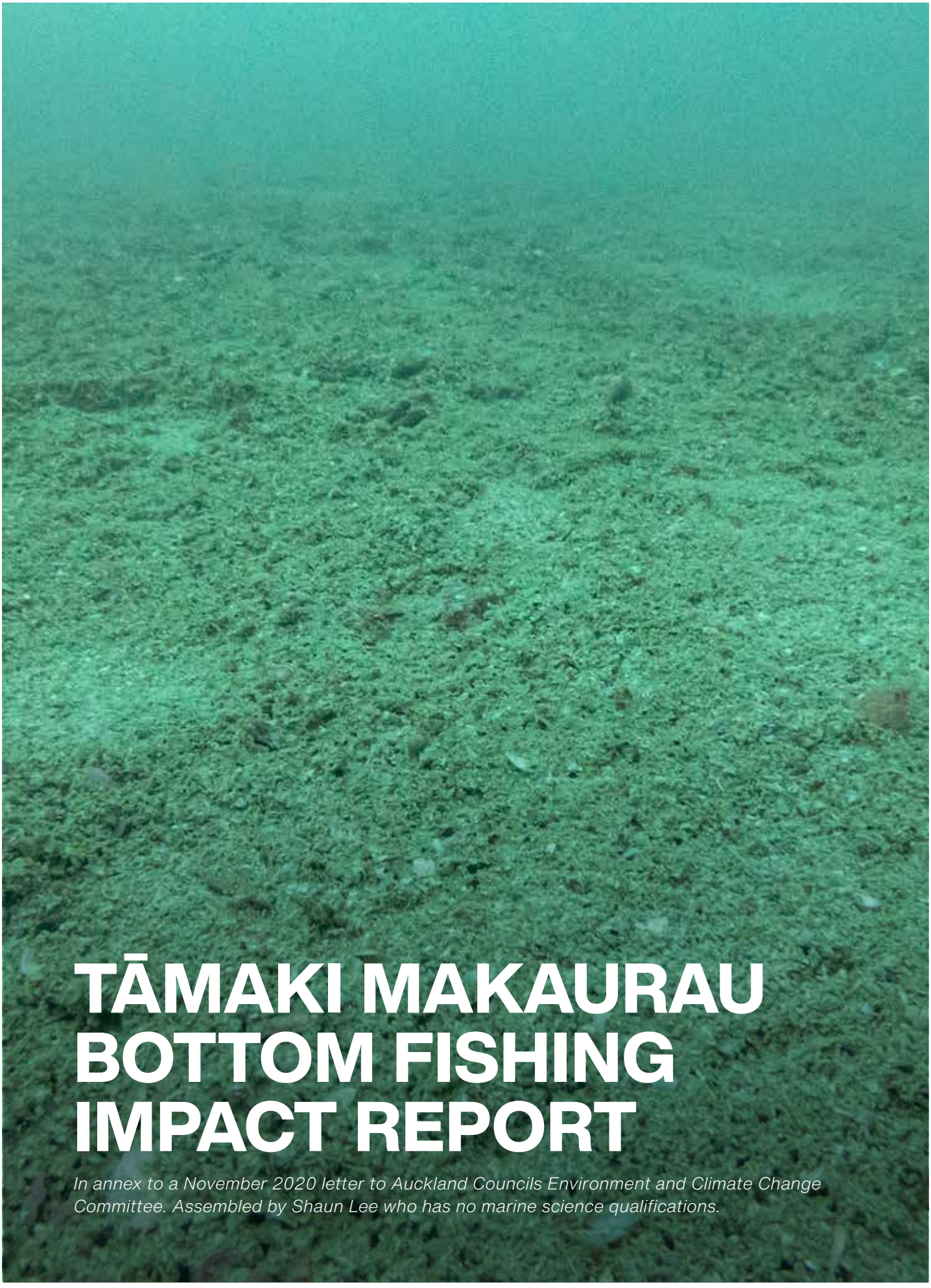


TĀMAKI MAKAURAU BOTTOM FISHING IMPACT REPORT

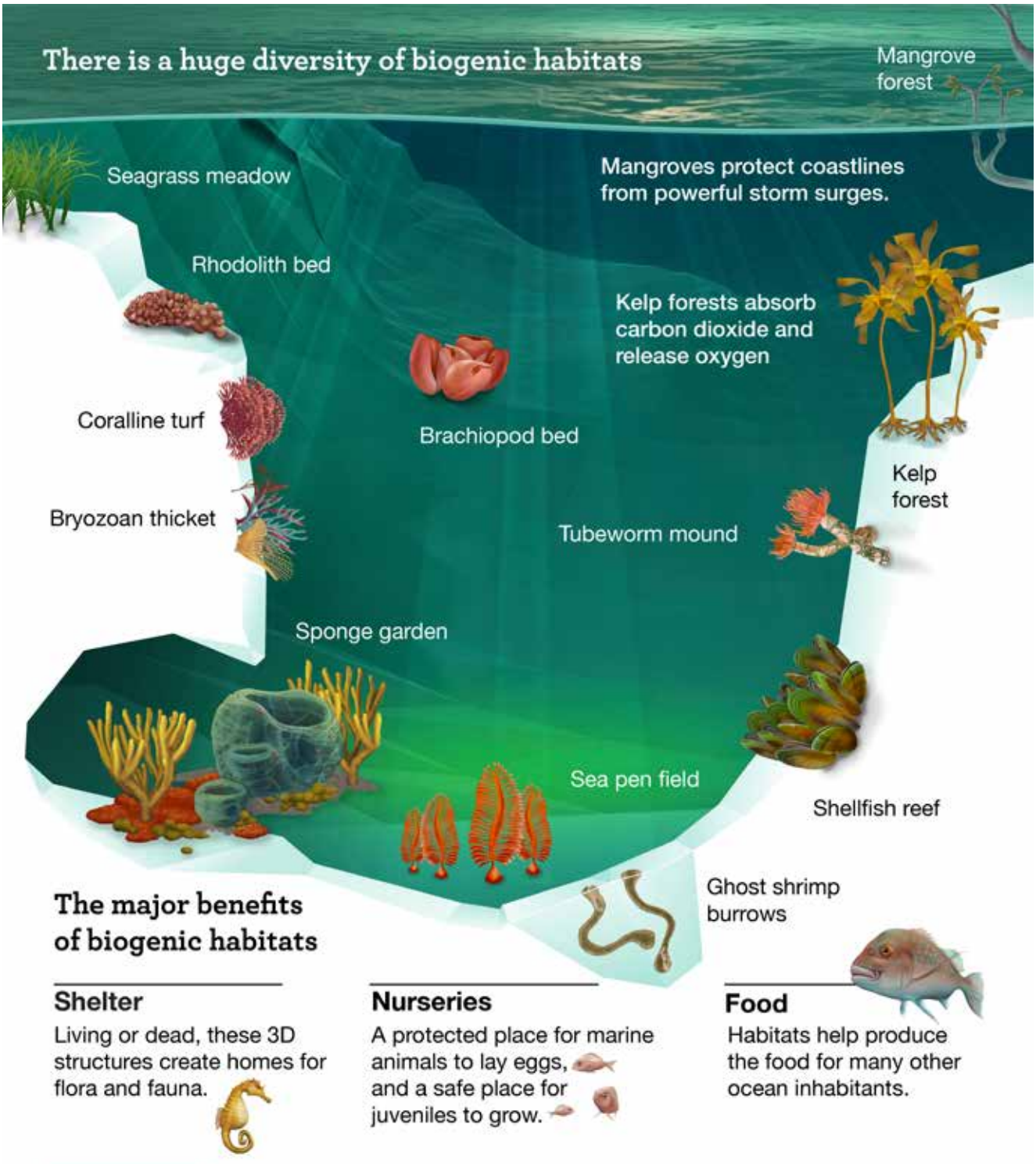
In annex to a November 2020 letter to Auckland Councils Environment and Climate Change Committee. Assembled by Shaun Lee who has no marine science qualifications.

Regularly dredged seafloor near the Noises Islands in the Hauraki Gulf Marine Park. Photo by Shaun Lee.

Seafloor protected from bottom impact fishing by a nearby mussel farm near Coromandel. Photo by Shaun Lee.

Trampling Auckland's blue gardens

A healthy sea floor is diverse and thick with living structures (biogenic habitats) which provide important ecosystem services.



Department of Conservation
Te Papa Atawbai

Diagram by the Department of Conservation

The most important groups in the Hauraki Gulf ecosystem are (in decreasing order): phytoplankton, macrobenthos (mainly small benthic crustaceans and worms), mesozooplankton (mainly copepods), bivalves and snapper. Management of the Hauraki Gulf should take into account the larger ecosystem effects that may result from further impacting these groups either directly (target species) or indirectly (impacts of bottom gear).

– Macdiarmid 2016

The argument about trawling first begun in 1899 when steam trawling was first introduced to the Hauraki Gulf. It was only a matter of months before strong opposition to trawling was expressed (Peart 2016). Parliament was petitioned to take immediate action. Even 100 years ago people knew that trawlers "*ploughed up the seabed, destroying food sources for larger fish*" (Peart 2016). The government was not keen to take action but pressure from traditional fishers created a ban in the inner Gulf in 1902, it didn't stop the main trawler who was fined and eventually put out of commission in 1904.

The fishing industry led by Sanfords lobbied hard to bring trawling back into the Gulf and succeeded in 1914. The seafloor was still largely intact with trawls from this period *"reporting nets being torn as it they were dragged over horse mussel and sponge gardens north of Waiheke and coral and shell west of Hauturu".* (Peart 2016). Fishers claimed that clearing the seafloor of old growth made way for new fresh growth. (Scientists now know thats not true, trawling destroys complex habitats that might take centuries or longer to return). New trawl doors were designed to force the mouth of the net down on the seabed creating much more damage to the seafloor. However the biogenic habitats continued to damage gear, so a solution was sought.

From 1915 *"... it was not possible to effectively trawl much of the gulf, because the sea floor was covered in horse mussels, corals and other growths, and these would snag the nets. To address this problem, an old ships chain was towed between two steam trawlers, out from Rangitoto Island, past the Noises Islands and into the outer gulf. This served to smash up the horse mussels and other obstructions. Much of the seafloor became a muddy 'paddock' which was regularly 'hoed' by trawl equipment."* (Peart 2016).

Today Aucklanders live with the desert created by those chains. The benthic ecology that supported the animals the fishers wanted to catch more of was foolishly destroyed and has not regenerated. Central government and industry who profited from the destruction have made no serious attempt to fix the damage done to Auckland's seafloors.

Hydroids. Photo by Shaun Lee.

Trawl door of Auckland fishing vessel 1926. Auckland Libraries Heritage Collections AWNS-19260805-49-1

"When the net was hauled up after trawling along the Tāmaki Strait they were found it full of 'grass and weeds', indicating the extensive seagrass beds in the areas."

– Peart 2016.

Subtidal seagrass is now very rare in the Gulf and seagrass is classified as at risk of extinction by the Department of Conservation.

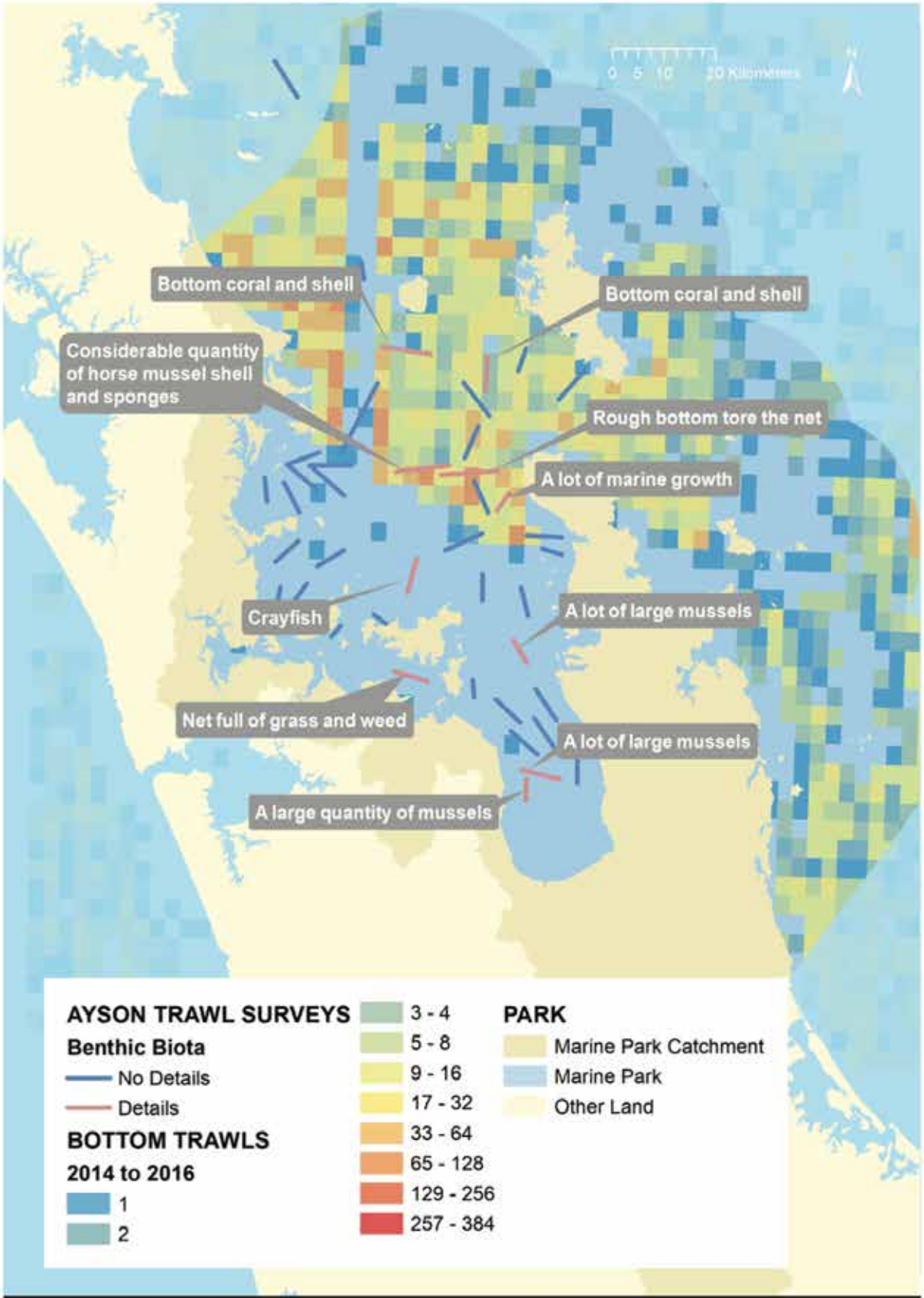


***Figure 6.8**: Bottom biota recorded during trawl surveys carried out in 1901 and 1907 by the Inspector of Fisheries, L. F. Ayson (Ayson 1901, 1908). Trawl lines are overlaid on a grid showing the number of bottom trawls undertaken between 1 January 2014 to 31 December 2016. Details about the bottom biota were provided for the red trawl lines, as indicated.*

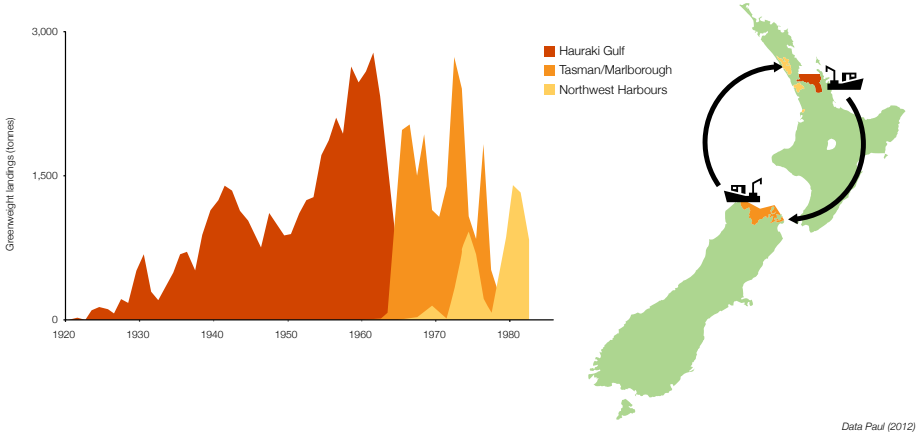
The fallacy that 'clearing the seafloor of old growth made way for new fresh growth' was also instrumental in the collapse of the green-lipped mussel fishery.

Despite evidence of local depletions in the 1950's, the government thought that the mussel fishery was being well managed and that dredging the 'matted and congested' beds would make them more productive. They were fished to collapse and the fishery was closed in 1969. Fishers had *"damaged the seabed to such an extent the mussels were unable to re-establish"* (Paul LJ 2012)

Commercial fishers like Ronnie Martin, Merv Strongman and Tommy Williams lament the loss of horse mussel beds which were 'badly damaged by seiners' and later trawlers

– Peart 2016.

Regional green-lipped mussels fishery collapse



Data Paul (2012)

A mussel dredge 1969. Note the size of the green-lipped mussels.

Selfie by Shaun Lee of his arm burried in mud up to his elbow near Ponui Island where dense mussel beds once existed.

In historic reports benthic bycatch was referred to as 'ocean rubbish' (Peart 2016). Now days boaties still refer to their anchors being 'fouled'. There is still a general lack of understanding of benthic ecology and the services it provides for pelagic fauna.

In 1994 Dr Simon Thrush and fellow scientists researched the effects of bottom impact fishing in the Gulf. They measured the presence and absence of marine organisms in areas of the Gulf subject to different fishing methods. Unsurprisingly, in the areas which had been impacted by fishing gear, they found fewer large organism, such as sponges, starfish, scallops and horse mussels. (Peart 2016).

"Fishing is the main anthropogenic disturbance agent to the seabed throughout most of New Zealand's EEZ" (New Zealand Inshore Trawl Fishery Report 2017).

The *Auckland Conservation Management Strategy 2014 – 2024* reports that fishing is a major threat to marine ecosystems. Overfishing is mentioned again and again in various habitat types with specific references to the *"Removal of epifauna and habitat homogenisation by mobile fishing gear"*. Yet since the publication of the document in 2014 the Department Of Conservation have done nothing to increase marine protection in the Auckland Region.

The impacts of scraping the sea floor are system-wide.

"Chemicals in sediments that would normally escape slowly are released in pulses every time the trawl or dredge gear goes over them, and the relative abundance of species is changed. The destruction of corals, sponges and gorgonians causes the deaths of juvenile fish and reduces their habitat—and affects global processes that we're only just beginning to understand."

"Those animals are profoundly important in the nitrogen cycle, the carbon cycle. The continental shelves make up just 7.5 per cent of the surface of the planet but they're the most important for those processes."

The continental shelves experience the most fishing pressure, but the industry's environmental impact there goes largely unregulated and unstudied, he says.

"They have profoundly changed the nature of some habitats that will take millennia to recover."

Moreover, because the quota system manages individual species in isolation, "there is no real understanding of the role of that species within an ecosystem," says Thrush.

– NZ Geographic Nov-Dec 2019.

Trawl gear affects the environment directly (scraping, ploughing, destruction of benthos, sediment resuspension, and waste dumping) and indirectly (post-fishing mortality, long term changes to assemblage)

Key (2002) recognised the potential impacts of climate change, pollution, dumping, and mining on deepwater benthic communities but identified bottom trawling as being the most pervasive human activity to affect New Zealand's benthic communities.

– **Consalvey 2006**.

Trawling can alter benthic communities, reduce total biomass of benthicspecies, and increase predation by scavengers.

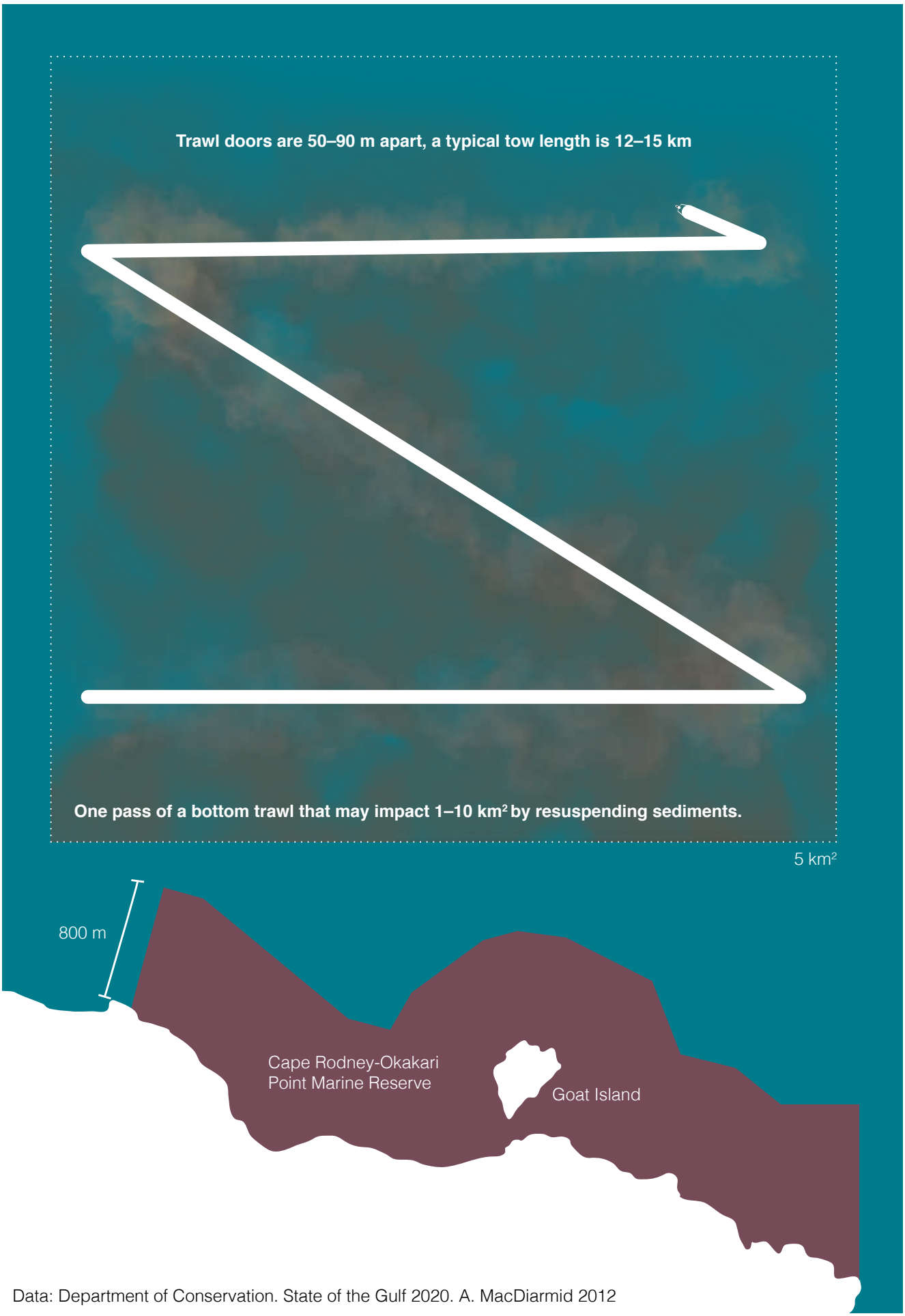
Mobile bottom gears can change the relative abundance of species and decrease the abundance of long-lived species with low turnover rates.

Recovery time from trawl-induced disturbance can take from days to centuries.

– MPI AEBAR 2018.

A trawl door from New Zealand retailer hampidjan.co.nz *"The trawldoors will last for a long time even working the worst rock bottom"* This one weighs seven tons.

Comparing the size of a single trawl with one of Aucklands largest marine reserves



Data: Department of Conservation. State of the Gulf 2020. A. MacDiarmid 2012

On 15 November 2007 17 areas in New Zealand's Exclusive Economic Zone (EEZ) were closed to bottom trawling, providing protection to an area of seabed habitat equal to 1.2 million square kilometres, or an area four times the landmass of New Zealand. This is the largest single marine protection initiative in a nation's Exclusive Economic Zone (EEZ) anywhere in the world. New Zealand has now protected 32 % of its EEZ from bottom trawling. These protected areas are, however, all located in deep water. The Ministry of Fisheries has stated that in the short term (to 2013), the focus of marine protection will shift to the Territorial Sea (from the coast to the 12-mile limit), where the problems are more immediate and most acute and where the risks to marine biodiversity are greatest and where the highest economic, social and cultural values are found.

- Rob Davidson et al 2010.

*The species that were most consistently identified as being negatively correlated with fishing pressure were those that either stand erect out of the seabed (e.g., horse mussels, sponges, bryozoans, hydroids, sea pens, tube building polychaetes), or live on the sediment surface, and thus are particularly sensitive to physical disturbance through either direct physical impact (e.g., Echinocardium), smothering (e.g., small bivalves) or increased vulnerability to predation following disturbance (e.g., brittle stars). Where examined, even relatively modest levels of fishing effort (i.e., fishing an area between once and twice per year, estimated at the 5km * 5km scale) reduced the density of the combined group of long lived sedentary habitat forming species and individual species group densities of holothurians, crinoids, cnidarians and bryozoans by at least 50%.*

– Tuck et al 2017

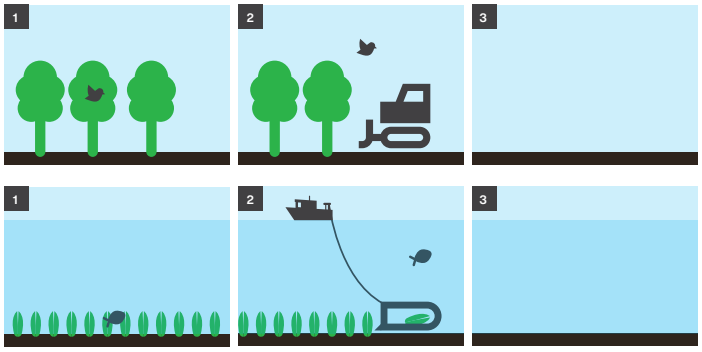
[Fishing] effects can lead to regional-scale reductions in some components of biodiversity, reduce benthic community productivity, alter natural sediment fluxes and reduce organic carbon turnover, and modify the shape of the upper continental slope, reducing morphological complexity and benthic habitat heterogeneity.

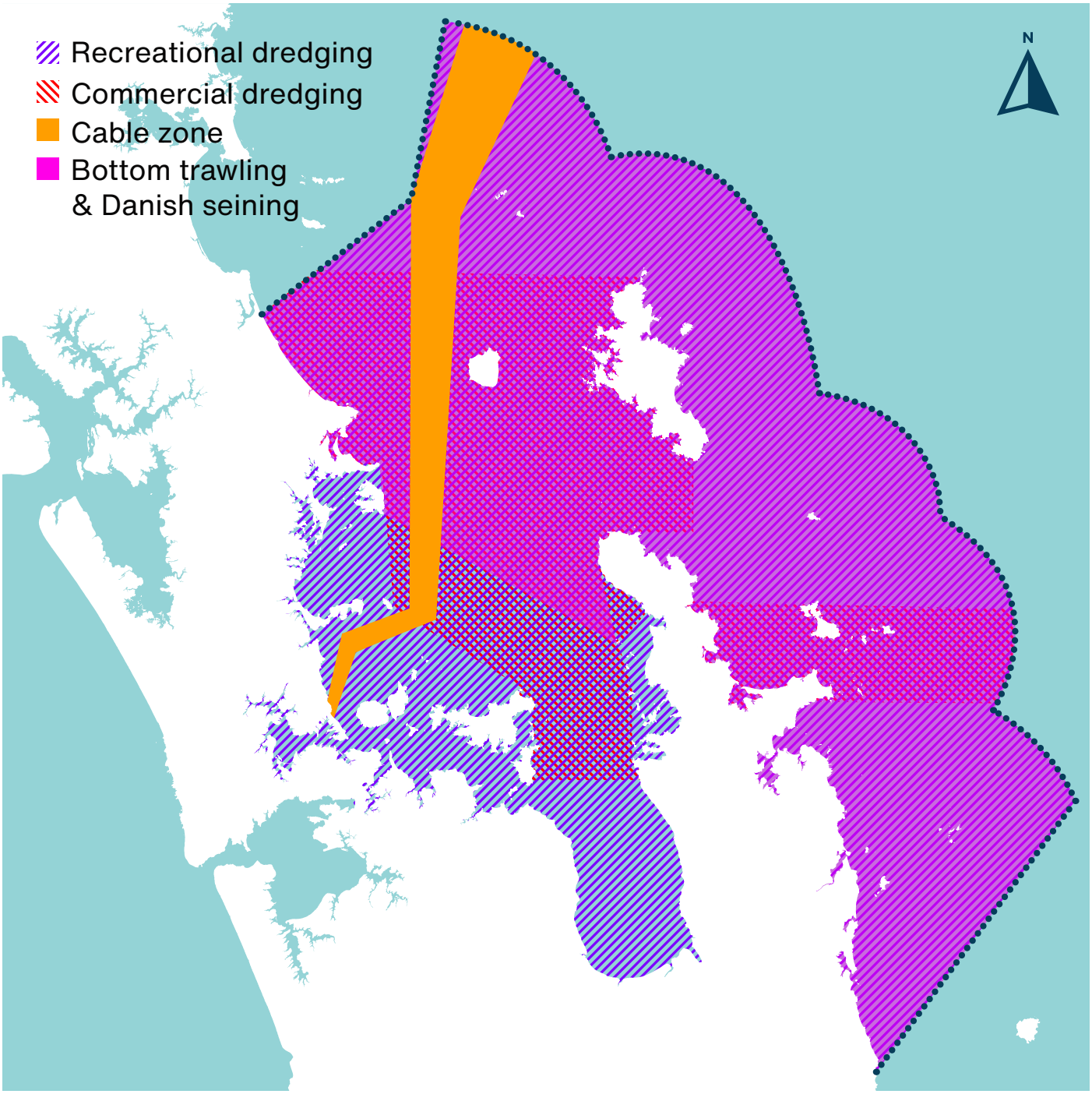
Within coastal regions, scallop dredges are generally considered to have a greater impact on benthic communities (per area fished) than trawls or Danish seines, as the gear is heavier and penetrates further into the seabed.

Typically, larger, longer lived, slow growing, fragile, erect, sedentary species (e.g., sponges, sea pens, corals, horse mussels) tend to be more sensitive to the physical impacts of fishing gear than smaller, faster growing, less fragile species living below the sediment surface. Sensitivity to re-suspended sediment is likely to be related to different life history characteristics, with species and habitats relying on photosynthesis (e.g. rhodolith beds) or vulnerable to smothering (e.g., sponges) probably most at risk.

– Morrison et al 2016

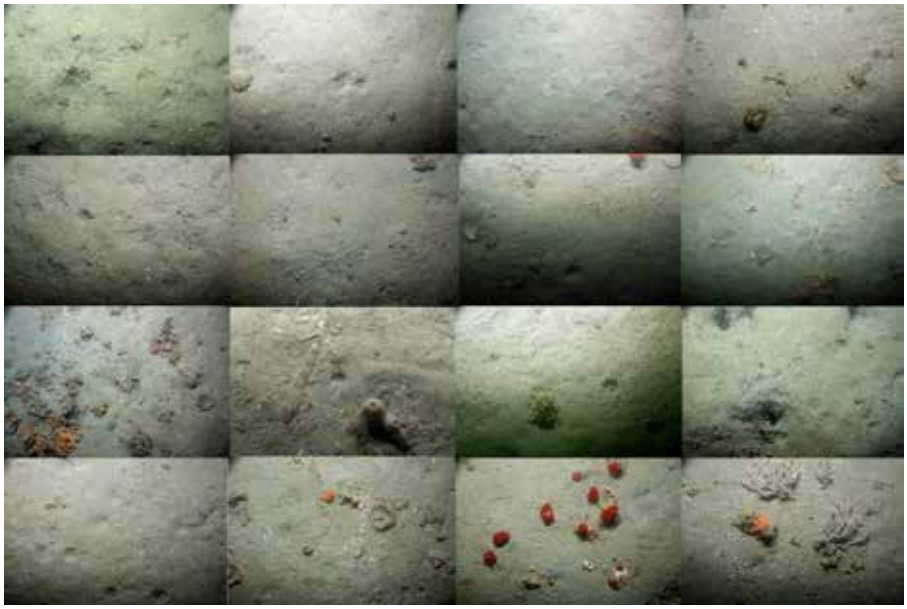
IT'S THIS SIMPLE





The cable protection zone is the only significant area of fully protected seafloor in the Hauraki Gulf Marine Park. Data from the State of our Gulf 2020.

Benthic disturbance from fishing varies in relation to the habitat, fishing gear, and environment, a 2016 study on the cable protection areas in the Hauraki Gulf was commissioned by Auckland Council in 2016. There had been little fishing in the areas for 16 years.



Block B from the study area.

The study found the biodiversity benefits of the protection areas to be negligible. The lack of large soft-sediment epifauna e.g. sponges, horse mussels, bryozoans in the protected area may be due to their absence from the area in the first place, or slow recovery due to no/low recruitment or habitat change.

Recovery from the effects of fishing might take 100's of years. 1,000's of kilometers of Auckland's seafloors may require active restoration and cost billions of dollars to restore. Let's hope not, and stop the trampling of our blue gardens immediately.

The legacy of habitat loss or modification through sedimentation and/or bottom trawling and dredging may prevent some populations from recovering. However, capacity exists to rebuild some populations and the models of the Greater Hauraki Gulf ecosystem provide a means to examine the ecological consequences of various rebuilding scenarios."

– Macdiarmid 2016

The best time to plant a tree was 20 years ago. The second best time is now.

– Traditional Chinese proverb

A deep water rocky reef found in the Cable Protection Area study including sponges and black coral

Impacts explained

Relevant statement of evidence of David Guccione on behalf of Motiti Rohe Moana Trust. In full here: https://www.environmentcourt.govt.nz/assets/Documents/Publications/David-Guccione-Evidence-in-Chief.pdf

Bottom trawling and dredging direct damage

5. The evidence that bottom trawling and dredging alter the natural ecosystem of an area is overwhelming and irrefutable. Both methods involve dragging either a heavy chain or a metal bar with teeth designed to penetrate the sediment, across the seabed. Any living creature attached to the bottom and in the path of the gear will be impacted, possibly torn away from its holdfast, possibly crushed by the chain or bar.

6. An illustrative example of the ecological effects can be seen by using the keystone species, the horse mussel or kukoroa (*Atrina zelandica*) (Fig 1) which will have roughly half to one third of its body and shell above the sand and the rest anchored below. Their shells provide an attachment spot for whelk eggs, filter feeding animals like sponges and tunicates, anemones, tube worms, algae and filamentous hydrozoans. The latter two are essential because they, act as a place where larval shellfish first settle, and without them, new recruits can't settle. The recruits are the next generation of young that will grow into the adults of tomorrow.

Figure 1 - A horse mussel covered in anemones and other encrusting life. The anemones use the shell as an attachment point in the otherwise soft sediment. Image courtesy of publicdomainarchive.com

7. The attached organisms on the shell, as well as the horse mussels themselves, represent the base of the food chain by filtering plankton from the water column and growing into something that can be eaten by fish and other predators. The horse mussel shells represent a hiding spot for crabs and molluscs that perform scavenging and cleaning services for the surrounding area. Even when the horse mussel itself dies, for a time, the shell remains standing upright, still an attachment and shelter point for a myriad of organisms.

8. When trawling or dredging gear comes over the area where a horse mussel is growing, the exposed portion of the shell is broken away along with all of those creatures attached to which it rely on for survival (1). The horse mussel itself is quickly eaten because it can't protect itself within its suddenly absent refuge. The empty shell below the sand quickly fills in, so the area has become a little less productive with each shell gone. This is just one species that provides structure, integrity and food to the ecology of the area but the domino effect is started and many others are affected or lost. Any large algae or animal protruding from the substrate is vulnerable to bottom trawling or dredging and will be affected in the same way.

9. The extensive mussel beds that used to carpet thousands of hectares of the Firth of Thames and Hauraki Gulf were dredged out and never recovered, most likely due to the lack of associated settlement structure for the new individuals to attach. It has been estimated that there used to be enough mussels to filter the entire volume of water in the Firth of Thames every two days, and now the remaining population would take two years to do the same. This represents a huge loss of the ecosystem services of maintaining water quality by reducing eutrophication and preventing algae blooms (2)(3)(4).

10. Trawling and dredging impoverish not only the benthic (bottom) community (5)(6)(7)(8), but also reduce populations of important finfish species and alter benthic-pelagic coupling (7). One pass of trawl or dredge removed up to 95% of the living benthic organisms in a horse mussel bed with no recovery seen a year later (9). We don't bulldoze a

forest in order to hunt deer or rabbits, but this is the direct equivalent of what bottom trawling and dredging do in the ocean and the Motiti Natural Environment Management Area is no different when these activities occur both by dredging and trawling.

Sedimentation from trawling and dredging.

11. The effects are over an area much more extensive than just the path of the trawl or dredge gear. As terrestrial animals it often assists to have analogues to understand the marine environment An example is the recent massive Southeast Asian forest fires that created air pollution and smog problems bad enough to be lethal in downwind cities (10)(11). The marine equivalent, sediment in the water column is stirred up and suspended with the passage of the trawl or dredge gear. The finer the particles, the longer they stay in suspension (12), and this can cause:

a. alteration of feeding patterns in fish (13)
b. increased mortality of eggs (14)(15)
c. inability for juveniles to settle (16)(17)
d. the loss of filter feeding organisms due to their soft structures being directly abraded (18), or their inability to feed while the sediment cloud is present (19)
e. increased light attenuation caused by turbidity reduces visibility, shortens the depth of the photic zone, and can alter the vertical stratification of heat in the water column (20).
f. The continual re-suspension and settlement of the sediments eventually flattens the surface into a uniform texture that is unlike a natural ecosystem (21). Even burrows for animals that live buried in the sediment such as tube worms and hides for octopus are collapsed.

12. Whether there is damage to the ecology of the area is not in question. The resilience of that ecology to the damage from bottom trawling and dredging is the only parameter that is variable. Recovery is generally long term, measured minimally in decades or longer, depending on the marine environment (7)(22).

13. We could view trawling or dredging a new area as no different to the removal of an old growth Kauri forest on land. *Neither the integrity nor the productivity of the marine environment can be maintained unless dredging (both recreational and commercial) and trawling are managed spatially so that there are refuges from
their impacts.

* An analogy first drawn by Watling and Norse in a seminal 1998 paper comparing trawling to clearcutting of virgin forest (35).

14. What all this means is loss of productivity and a greatly altered ecosystem. The natural ecosystem, or natural state of a particular environment will be altered, if bottom trawling or dredging, including recreational dredging, are present.

Our corals

Corals have a valuable ecosystem function but are fragile (Consalvey 2006). Vulnerable species are also long-lived (100's of years), with slow reproduction, and can be exterminated with one trawl passage (ICES 1994) and have a long recovery period.

Over 50 percent of the world's coral reefs have died in the last 30 years. Thats what has happened on our generations watch, largely due to climate change. Auckland lost most of it's corals early last century due to destructive fishing methods. However there are many species left, four groups are in danger of extinction and protected under the Wildlife Act since 2010. They are found on both of Aucklands Coasts (see map on following page). By having a strong climate change policies Auckland Council can help reduce ocean acidification and temperature rise but it can have a far more immediate impact by stopping fishers from regularly smashing the fragile corals into small pieces.

The Wildlife Act 1953 makes it illegal to deliberately collect or damage these species and all protected corals accidentally brought to the surface (e.g. on or in fishing gear or fouled by anchors) must be immediately returned to the sea. This is like returning dead birds accidentally shot by hunters to the forest, Auckland Council should take a much more sensible approach to coral protection.

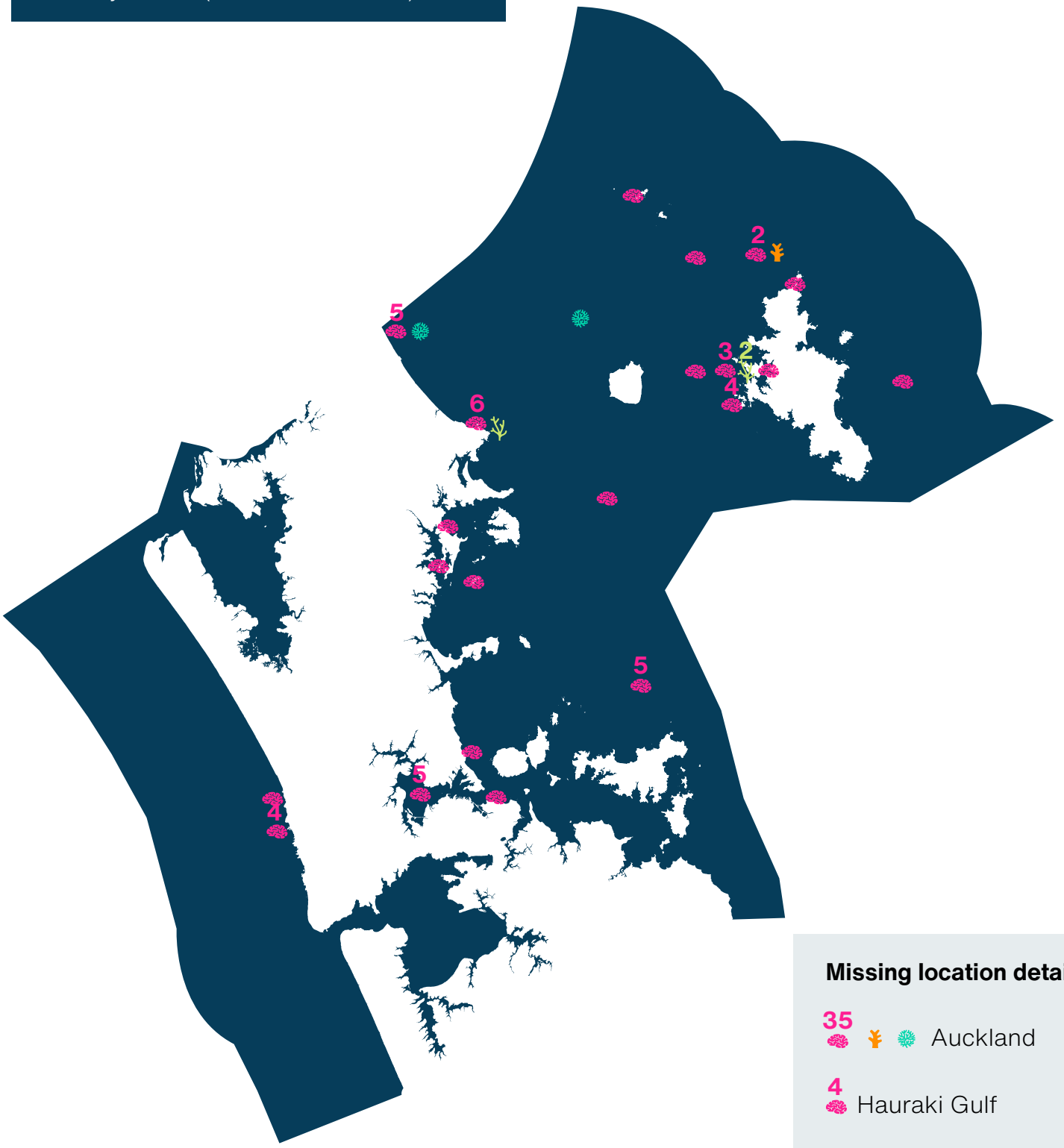
"Long-lived species, surface-living species, structurally fragile species, and biogenic habitat-forming species are all particularly vulnerable to the effects of fishing on soft sediment habitat, fauna and processes... The direct physical disturbance of corals by bottom trawl gear is the most obvious and dramatic source of impact. However, secondary effects on corals can come about through sediment plumes from fishing operations which can smother small corals, or clog polyps and affect feeding success. Trawl gear mobilises sediments creating plumes of particles in their wake which are typically 2–4 m high, and 120-150 m in width depending on the size of trawl gear. In low-current, deep-sea environments, these can disperse very slowly over large distances, and potentially affect areas well beyond, and deeper than the area of the fishery. O'Neill & Summerbell (2011) estimated that a typical Scottish demersal trawl would suspend up to 3 kg/ m2 of sediment between the trawl doors, and trawling-induced sediment gravity flows can remove large volumes of sediment from the shelf."

"Static gears, such as longlines and traps are considered to have lower impacts than mobile gear types, by up to 300 times. However, in certain conditions, for example during retrieval, static gear may move laterally across the seafloor, resulting in impacts to the habitat and biota. Longline impacts on sessile fauna such as sponges and corals has been observed where the animals have been broken by longline weights or by the mainline cutting through them while moving laterally during fishing or hauling."

RECORDS OF

Protected corals in the Auckland Region

- Black corals (order Antipatharia)
- Gorgonian corals (order Gorgonacea)
- Hydrocorals (family Stylasteridae)
- Stony corals (order Scleractinia)



Missing location detail

35 Auckland

4 Hauraki Gulf

2 2 29 Aotea

3 Waiheke Is.

4 Waitakere

Some records are beach collected (washed up)
Earliest records collected in 1962
Data care of: NIWA, Auckland War Memorial Museum and iNaturalist.nz

"The Resource Management Act 1991 promotes the sustainable management of the natural and physical resources of the land and territorial sea of New Zealand. One of the listed matters of national importance is the protection of significant habitats of indigenous fauna. The New Zealand Coastal Policy Statement 2010 (NZCPS) is a "second level" statutory instrument developed under the Resource Management Act to provide national level policies for the management of the coastal environment including the territorial sea. It is required to be given effect to in regional level documents such as regional policy statements, and regional coastal plans. Policy 11 of the NZCPS refers specifically to indigenous biological diversity. Adverse effects of activities on those New Zealand corals that are listed in the New Zealand Threat Classification System are to be avoided (i.e., not allowed) and adverse effects are also to be avoided on indigenous ecosystems that are threatened or are naturally rare. "

– Malcolm Clark Et al. 2019

Trawling and dredging adversely affect deepwater corals and coral habitats. Recovery from this type of disturbance is likely to take decades and possibly hundreds of years due to the very slow growth rates of deepwater species.

Suspension of sediments by trawls may also smother coral larvae and settlement surfaces. In shallower water corals are vulnerable to damage by anchors, rock lobster pots, droplines, careless divers and collectors.

– doc.govt.nz Protected Corals

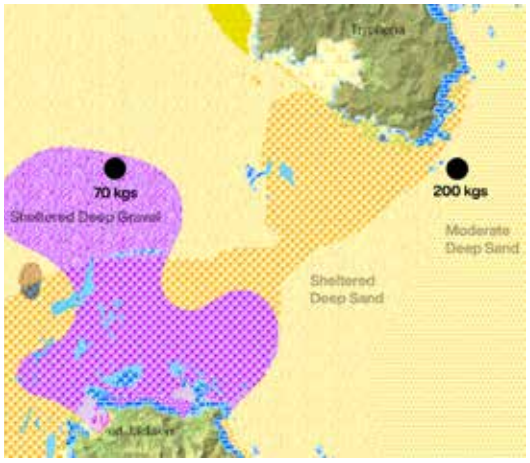
As with the other benthic epifauna (directly and indirectly affected by bottom impact fishing) Auckland corals will take a long time to recover. That is no reason not to start protecting them now. Locally extinct species are regularly re-discovered in pest free terrestrial sanctuaries. It's likely there are small oases of protected coral species that have avoided fishing damage. Few trawls are inspected by observers and even less are able to report and identify coral species but on the 29th of the December 2013 200kgs of corals was bought up from the seafloor of the southern end of Aotea / Great Barrier Island. Just 10km to the east of that, 70kgs of coral was hauled up on the 19th of June 2019. (Data obtained from MPI via Official Information Request). The habitats are recorded on SeaSketch as 'Shelted Deep Gravel', 'Sheltered Deep Sand' and 'Moderate Deep Sand'. These are just two glimpses of what we might be able to protect and restore.

Unfortunatly the degraded state of Gulf benthos means small pockets of remaining corals are fragmented. Small MPAs won't do and a complete ban on bottom impact fishing is required to save the remaining oases.

Some people think that the seafloor of the Gulf is now too degraded by bottom impact fishing to recover. If that was true then surely bottom impact fishing would be banned through out New Zealand immediately.

"This is surely the nail in the coffin for any claims to sustainability from the bottom trawling industry."

– Hague 2020



Coral hauled up by fishing vessels with observers onboard. Data obtained from MPI via Official Information Request, Map from SeaSketch.org

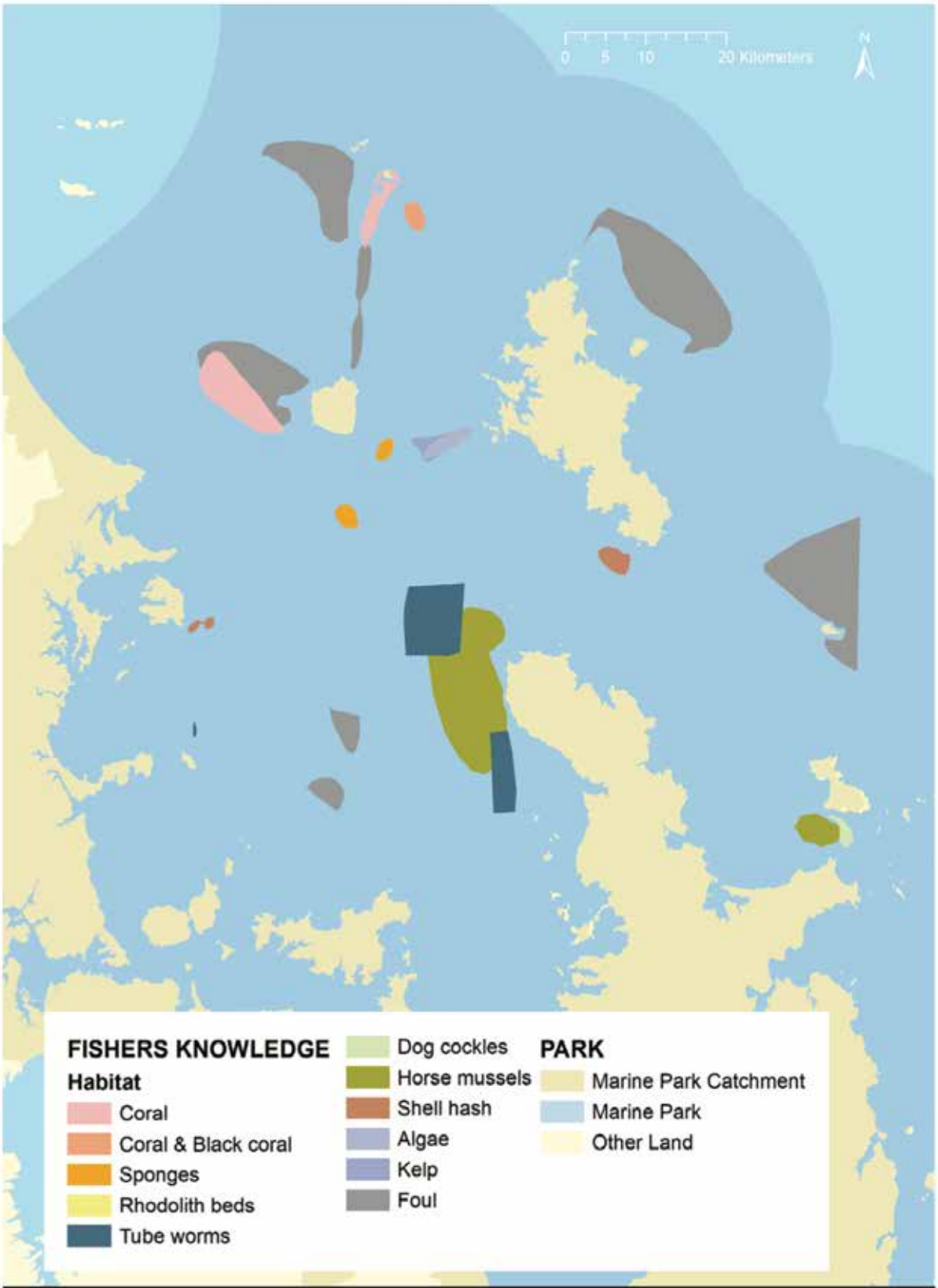
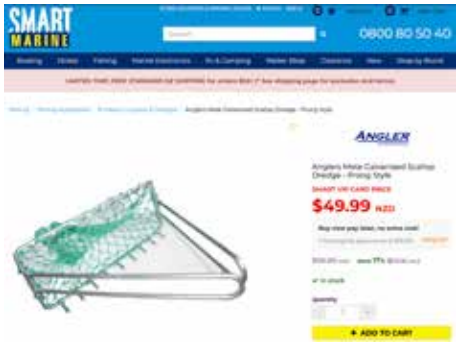


***Figure 5.19**: Biogenic habitats identified by active and retired fishers with a history of working in the Hauraki Gulf / Tīkapa Moana / Te Moana-nui-a-Toi (adapted from Jones et al. 2016).*

Map from page 108 of the Hauraki Gulf 2017 State of the Environment Report

Recreational dredging



A small recreational dredge for sale.

Like the use of plastic bags recreational dredging is going out of fashion. Fishers are becoming more educated about the impacts of different fishing methods.

In 2017 fishing retailer Burnsco took the lead in encouraging responsible use of the Aucklands fisheries by refusing to stock and sell scallop dredges.

Burnsco Managing Director Bruce McLeod said "We have not stocked scallop dredges for a number of years now. Burnsco staff were concerned at the damage done to the seabed by the dredges. This deterioration of the seabed has been well documented (eg Urlich 2016) and unfortunately has increased significantly over the years as dredging has become more intensified. Customers can still, of course, dive for scallops if they want them."

LegaSea has welcomed the policy. "It is reflective of a more Fish Care orientated approach we hope to gain from retailers in the future as we look to restore abundance in our inshore fisheries," said LegaSea spokesperson Simon Yates.

- Gulf Journal December 2017

An NZ made heavy duty recreational dredge for sale.

www.marine-deals.co.nz and Decoro have since followed suit and in September 2020 the New Zealand Sport Fishing Council voted to *"strongly encourage the gathering of scallops by diving and selective hand gathering where possible"*. They said the *"science backs up the widespread anecdotal evidence - that scallop dredging causes serious harm to the seafloor and impacts the overall health of our precious marine ecosystems."*

Four years ago Sea Change suggested a phased approach to transition commercial and recreational scallop dredging out of the Hauraki Gulf Marine Park. It included a timeline.

c) By 2018 ban the use of scallop dredges in areas less than 20m deep within the Hauraki Gulf Marine Park.

d) By 2025, prohibit the use of scallop dredges within the entire Hauraki Gulf Marine Park.

- Sea Change 2016

The Government has ignored the recommendations but now Auckland Council can implement the recommendations and start protecting benthic biodiversity.

Māui dolphin

Auckland Council is lucky have the worlds smallest (and most endangered) dolphin in its backyard. While feeding on the seafloor it it threatened by bottom contact fishing methods. Auckland Council has submitted on the threat management plan for protecting Hector's and Māui dolphins but have not been able to control fishing activities that threaten the world population of only 60 adults. Excerpts from the 'Auckland Council staff feedback on proposals for an updated threat management plan for protecting Hector's and Māui Dolphins August 2019' below:

4.5 Auckland Council staff do not support fisheries management objectives and management objectives for petroleum exploration and seabed mining that allow for any Māui dolphin deaths. Management objectives for these activities should aim for zero Māui dolphin deaths.

4.6 Many other threats to Māui dolphins (such as climate change impacts and impacts from diseases) are very hard to manage and control and are therefore likely to continue to impact on the Māui dolphin population. Staff believe that known threats to Māui dolphin that can be managed relatively easily compared to these other threats (such as set netting, trawling, petroleum exploration and seabed mining) should be managed aiming for zero dolphin deaths.

4.7 Auckland Council staff believe that Fisheries New Zealand should aim for zero Māui dolphin deaths caused by set netting and trawling.

4.8 Auckland Council staff believe that set net closures and trawl closures should follow the functional 100 metre depth contour, rather than a standard offshore distance for the reason of protecting the dolphins within their potential feeding range.

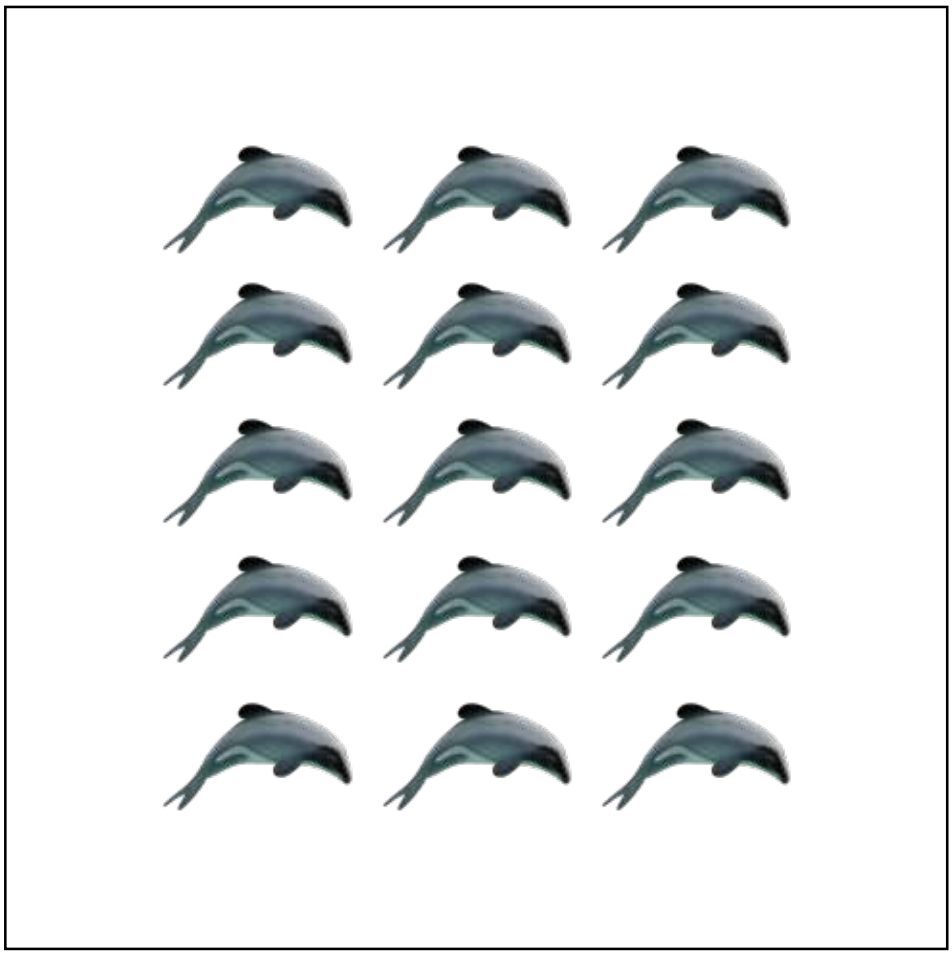
4.9 Staff acknowledge the estimated impacts on the commercial fishing industry but believe that these closures are necessary to save the world's rarest dolphin. Loss of this species would not only be a huge loss to Aucklanders, but also impact on New Zealand's reputation for being a green and clean country that cares about its environment.

Banners used by the Waitākere Ranges Local Board

A lawsuit was filed in the United States calling for an import ban on New Zealand seafood caught in the threatened dolphin's habitat due to New Zealand's protection laws for marine mammals not being as stringent as those in the US (Sam Sachdeva 2019). The ban would have cost NZ $200 million in seafood exports a year.

Protections is still not good enough. The government has not chosen the option in the consultation document (MAUI TMP 2019) with the greatest change to current fishing activity. Māui dolphins are still not protected from trawling and set netting out to 100m depth thoughout their home range. This was specifiaclly asked for in by Auckland Council (4.8 on previous page) and recommended by the IUCN. In several areas the restrictions fall short of the 12 nautical mile limit. The IWC has recommended controls to 20 nautical miles offshore.

This means there will still be risky fishing in Māui dolphin habitat. Internet cables appear to have more protection than dolphins in maps released that show no fishing areas where cables are. The plan will delay but not avert extinction.



There are only fifteen mother Māui dolphins left in the world. Illustration by Shaun Lee.

A chapter on the indirect effects of fishing from the *State of our Gulf 2020.*

Read the full doccument here
https://gulfjournal.org.nz/state-of-the-gulf/

ĒTAHI ATU TUKUNGA IHO O TE MAHI HĪ IKA
Indirect effects of fishing

Bottom trawling and dredging destroy important seabed habitats like horse mussel beds. Photo by Professor Simon Thrush.

"We plow our land too. Forty-five percent of New Zealand's land mass is plowed or farmland, where only 3% of New Zealand's EEZ are bottom trawled. But we make a big thing about 'that'. Emotionally I think that is wrong. We need to look at the science here."

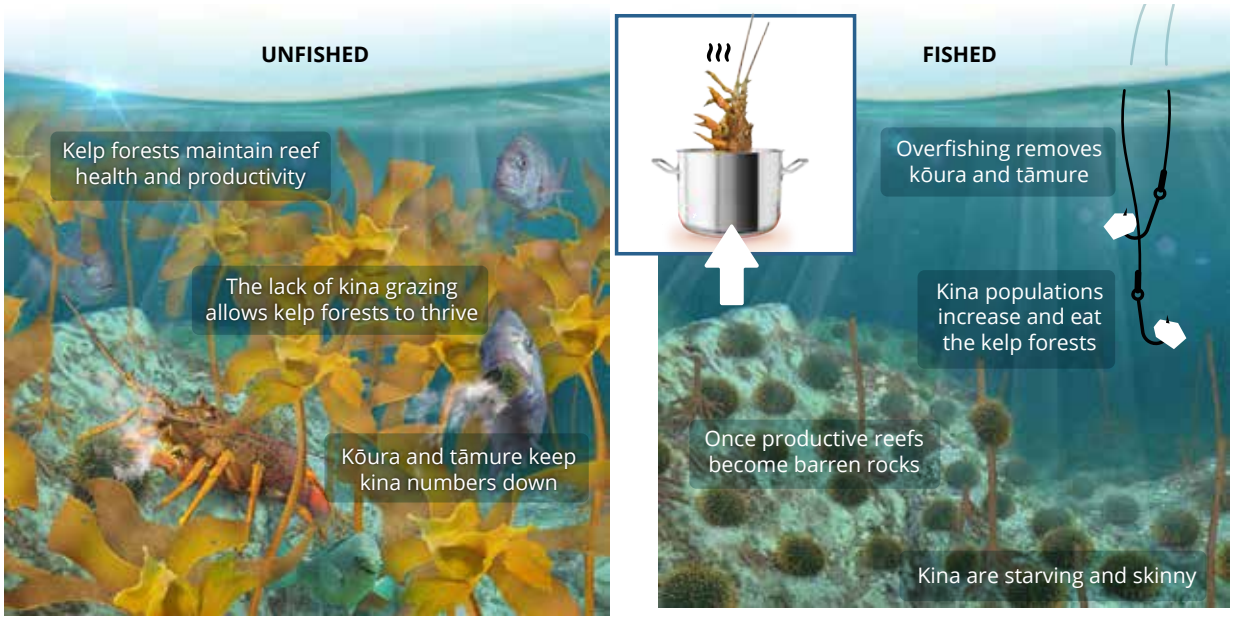
– Volker Kuntzsch, Chief Executive Officer, Sanford. Panel discussion at the Hauraki Gulf Marine Park Conference, 2019.

Fishing doesn't only affect the species captured, it also has direct and indirect impacts on non-target species and the seabed. Fishing methods such as bottom trawling, Danish seining, and tipa (scallop) dredging damage the seabed and the animals and plants that grow there. Seabirds are accidentally caught by longlines, set nets, and other fishing methods. Undersized or non-target fish are captured and discarded.

Fishing also effects the dynamics of food webs and the characteristics of marine communities. The reduction of top predators such as tāmure and kōura (crayfish) allow prey such as grazing kina to flourish. This results in the loss of kelp forests. Elsewhere, the reduction of bait fish reduces the food available for larger fish, marine mammals and seabirds. Ecosystems that are damaged by bottom trawling and are fished close to their maximum sustainable yields are less resilient other stressors, such as climate change.[34]

This section focuses on the fishing methods that disturb the seabed, the indirect effects of fishing for tāmure and kōura, and the incidental bycatch of seabirds.

Flesh-footed shearwater caught by a small vessel long lining off Aotea. Photo released by MPI.



Kina barrens are created by overfishing

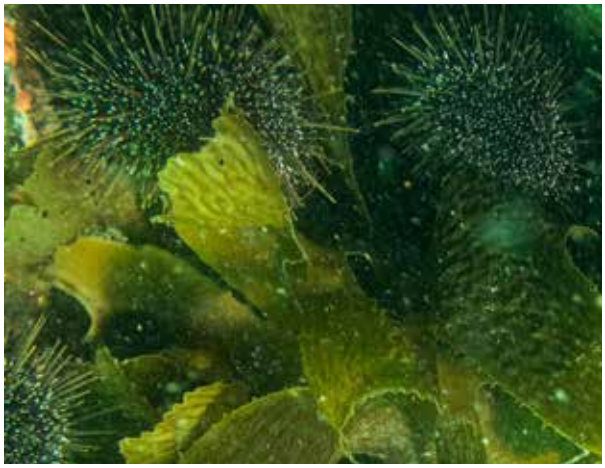
20 YEARS AGO

In the three years immediately before the park was established (1996–97 to 1998–99):

- around 15,800 bottom trawls and 3,666 Danish seine sets are estimated to have occurred in the Marine Park;
- around 2250 tipa dredge tows occurred in reporting areas within or bounding the park. This is the highest number of tows for any three-year period since that time.

The depletion of tāmure and kōura populations was found to be linked to the expansion of kina barrens in the Marine Park.[19]

Published figures for the Marine Park are not available, but in 2000–01 an estimated 645 seabirds were caught in the entire tāmure longline fishery, which mainly occurs in northeast Aotearoa[35] *(see Page 145 for details).*



Kina eating kelp. Photo by Shane Kelly.

TODAY

The number of bottom trawls (7658) over the three-year period between 2016–17 to 2018–19 was 51% lower than in the three years immediately before the park was established (***Figure 20*** and ***Figure 21***).

There has been little change in the number of Danish seine sets, but fishing effort is now more concentrated in a smaller area (***Figure 20*** and ***Figure 22***).

Commercial fishing regulations prohibit Danish seining by single vessels less than 20 m in length in around 300 km^2 of water, where it has been allowed to operate. In the most recent three-year period around 800 Danish seine events (22% of all events) occurred in those areas (***Figure 23***).

In the 20 years of the park's history, the total number of tipa tows varied widely between years and locations (***Figure 24*** and ***Figure 25***). Since 2000, running three-year totals have ranged from around 450 to 1880 tows. 1100 tows occurred between 2015–16 to 2017–2018.

Work on estimating the overall extent of urchin barrens in the Marine Park has recently begun, with accurate figures not yet available.

Published figures for the Marine Park are not available, but in 2016–17 the estimated number of seabirds caught in the entire tāmure longline fishery (399 birds[36]) was 38% lower than in 2000–01. Despite this, there is estimated to be a 70% likelihood that annual potential fatalities from commercial fishing are greater than what the population of threatened tāiko can sustain. For all other seabirds the estimated likelihood is less than 5%.[37]

2002: National workshop on reducing seabird mortality held, to the establishment of Southern Seabird Solutions.

2011: Large tipa bed was discovered in deep water, west of Cape Colville. Dredging spikes in that area over the next two years.

2012: Panel of experts rank bottom trawling 3rd equal highest threat to Aotearoa's marine habitats (behind ocean acidification and global warming).[38]

2013: Stock assessment indicates the Hauraki Gulf/Bay of Plenty tāmure substock is sitting just below 20% of its unfished state.

2014: MPI made aware of discrepancy between fisheries regulations and how the Danish seining regulations were being applied.

2014: Black petrel working group formed with the aim of reducing pressure on seabirds in the Gulf and beyond.

2014: Tipa bed discovered in 2011 collapses. Dredging effort reverts to the areas fished before it was discovered.

2014–18: Commercial kōura catches are progressively reduced as concerns grow over the depleted state of the stock. The recreational catch allowance (but not catch limits) was also reduced in 2018 (*see Page 53*).

2017: Sea Change — Tai Timu Tai Pari makes recommendations to manage the indirect effects of fishing.

2018: Changes to mandatory seabird mitigation measures for longlining. These provide for the use of hook shielding devices as a standalone measure, and amend tori line requirements to accommodate smaller vessels.

2018: Ministerial Advisory Committee established to consider Central Government's response to Sea Change.

2019: Court of Appeal rules the RMA does not prevent regional councils from controlling fisheries resources through their RMA functions, provided they are not doing so for Fisheries Act purposes (*see case study on Page 72*).

Green-lipped mussel reef. Photo by Shaun Lee.

KEY EVENTS

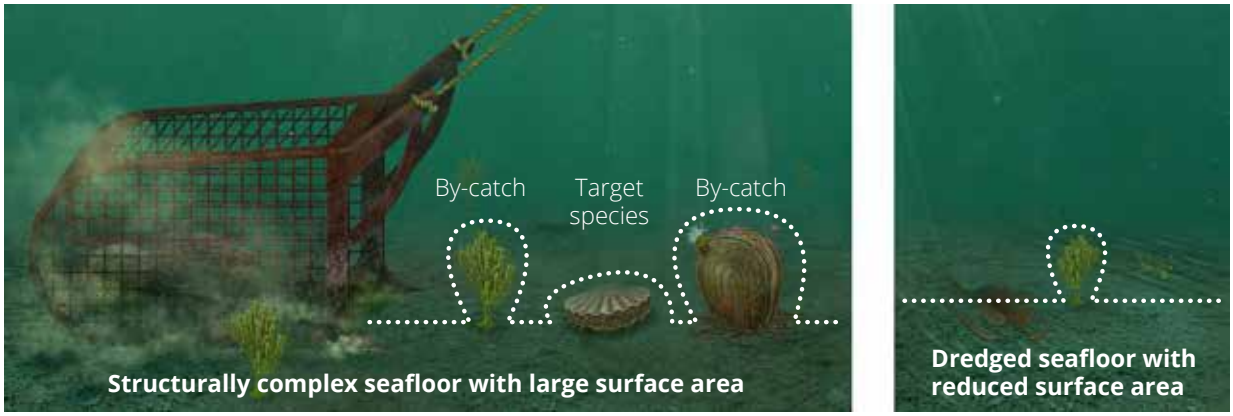
Research has substantially improved our knowledge of the indirect effects of fishing since the Marine Park was established. It is generally accepted that fishing has had a role in the decline of vulnerable seabird populations, the shift from kelp forests to urchin barrens in the Marine Park, and the disturbance and degradation of areas subject to dredging and bottom trawling.[34] More is also known about historic changes such as the loss of extensive mussel beds from overfishing. Historic mussel beds were potentially one of the most important ***"biogenic habitats"***[m] in the Marine Park. Besides losing the mussels themselves, we also lost their filtering capacity and the broader biodiversity values they supported. Ecosystem-based management is now accepted as best practice in fisheries management, but we are still managing species individually.

Dredged seabed near Waiheke Island. Photo by Shane Kelly.

Positive steps have been taken in some areas, particularly around seabirds. Those steps included the establishment of Southern Seabird Solutions Trust in 2002 and formation of the Black Petrel Working Group in 2014. The latter group having a specific focus on reducing seabird catches in northeastern Aotearoa. ***A summary of achievements since 2002 is provided on page 145.***

The regulations clearly define the areas where Danish seining is prohibited. However, Fisheries NZ are of the view that the coordinates, landmarks and bearing used to define an exemption area for single vessels under 20 m in length, were an unintended outcome of regulatory changes made in 1986. A slightly amended version of the pre-1986 regulations is still being applied. Fisheries NZ

[m] Biogenic habitats (e.g. sponge gardens, shellfish beds) differ from other physical habitats (e.g. sand, rock) in that the habitat structure is formed by the plants and animals present.



Dredging indiscriminately destroys life attached to the seafloor

acknowledges there is a discrepancy between how the legislation, which defines this area, has been interpreted and presented in this report, and what is currently understood and enforced in practice. They have committed to reviewing this discrepancy as part of management actions put forward in a fisheries plan for the Hauraki Gulf, which is being developed as part of central Government's response to the Sea Change Hauraki Gulf Marine Spatial Plan.

Another significant development was the Court of Appeal's findings in relation to regional councils being able to manage the indirect effects of fishing, provided they are not doing so for Fisheries Act purposes (***see case study on Page 72***). Sea Change – Tai Timu Tai Pari also offered potential solutions, including:

- transitioning to seabed-friendly fishing methods by phasing out bottom trawling and Danish seining in the Marine Park;
- phasing out recreational and commercial scallop dredging;
- active restoration of marine habitats such as shellfish beds; and,
- establishing a variety of protected areas where fishing is more tightly controlled.

Despite these outcomes, holistic actions on managing the indirect fishing effects have not yet materialised and recent fisheries management decisions have remained largely focussed on maximising sustainable catches of target species.

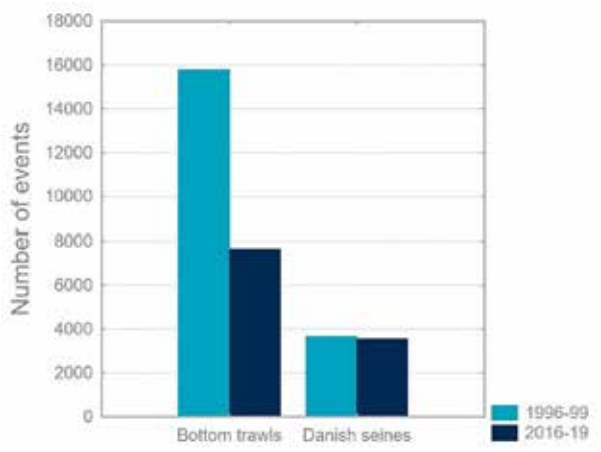
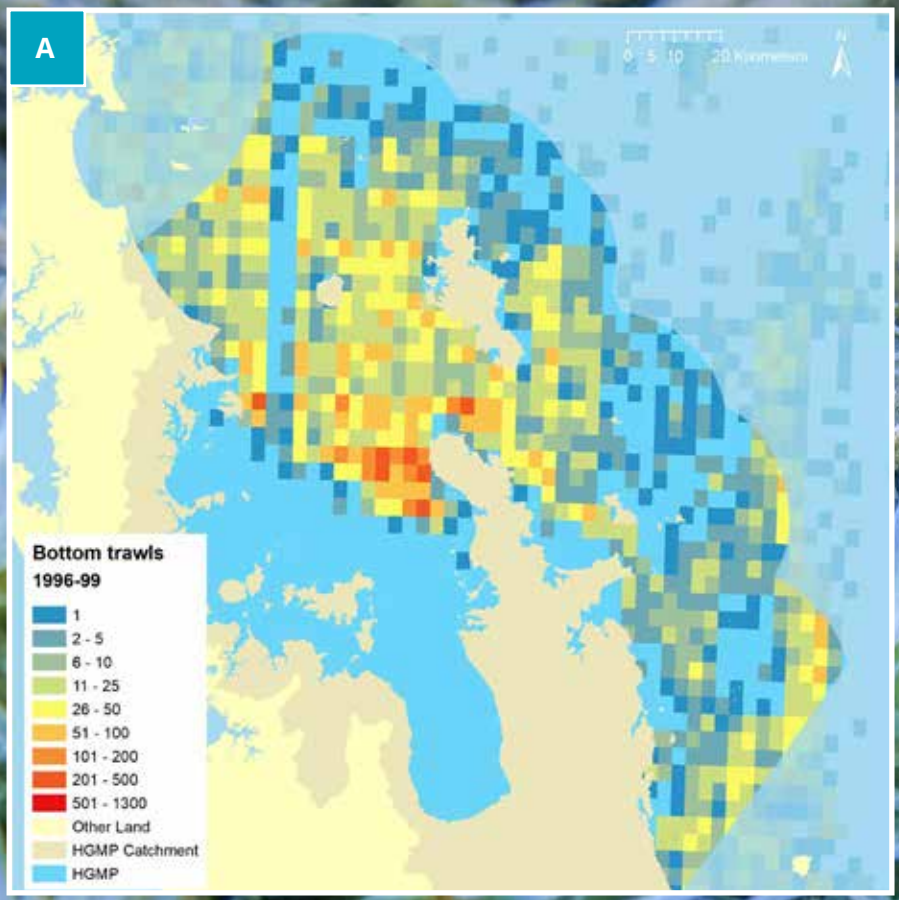


Figure 20: *Differences in the numbers of bottom trawls and Danish seine sets in the three years prior to the Marine Park being established and the most recent 3-year period.*

Baby dolphin entangled in fishing gear on Tāwharanui beach. Photo by Alison Stanes.



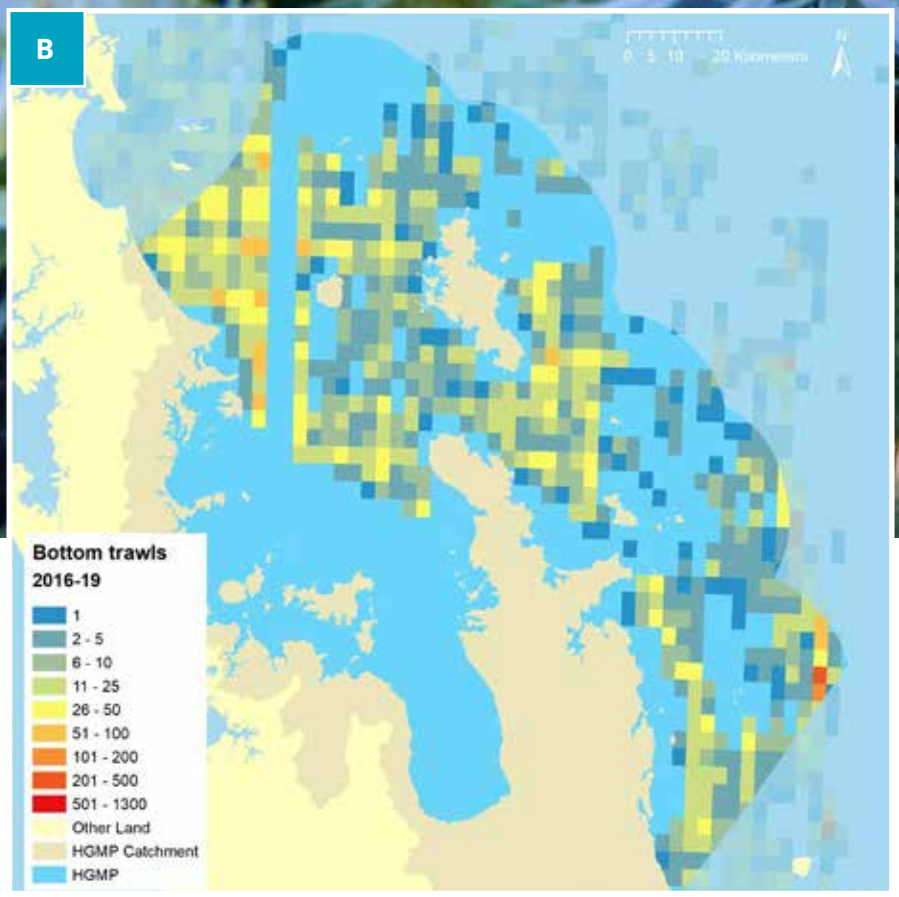
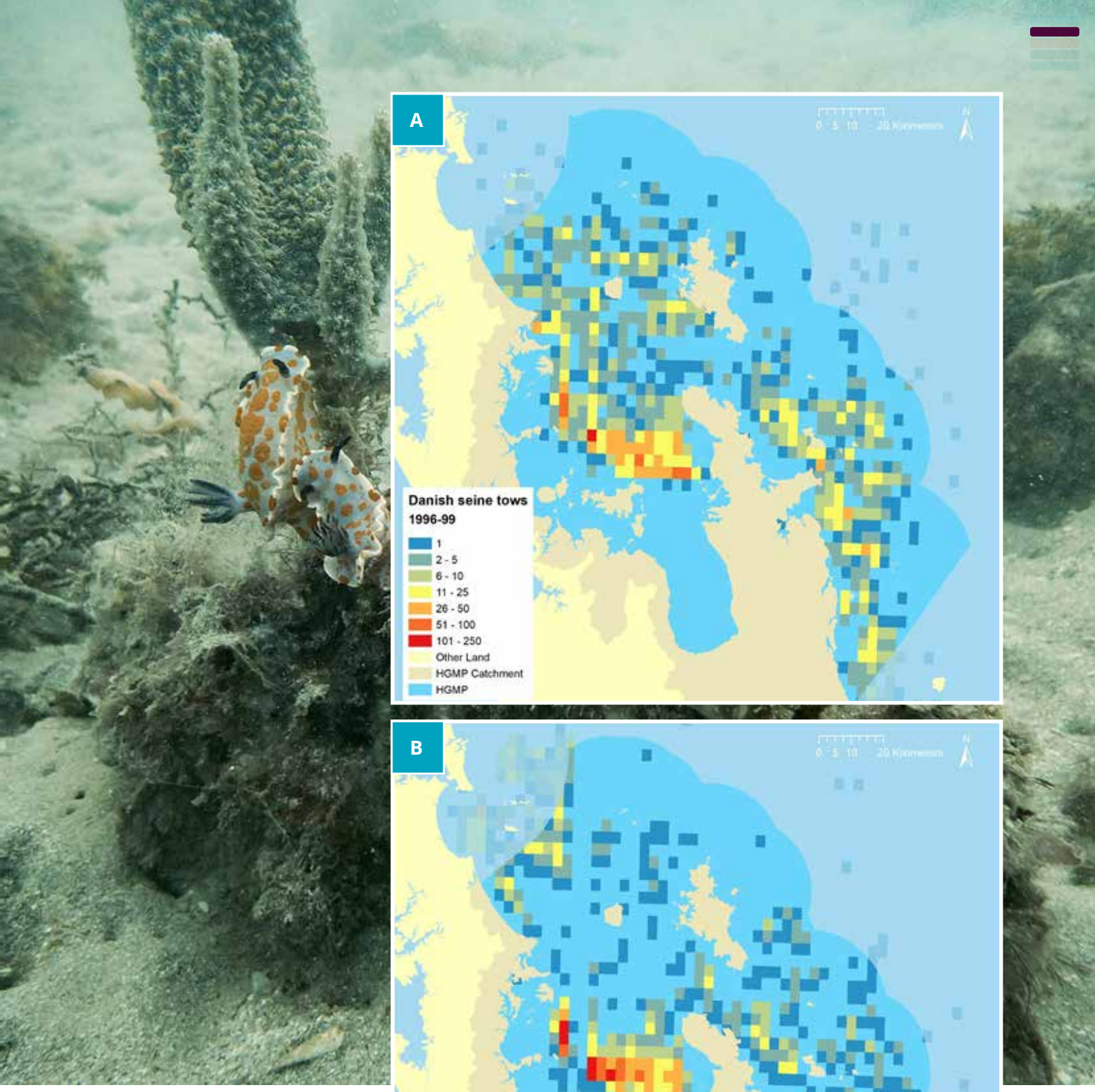


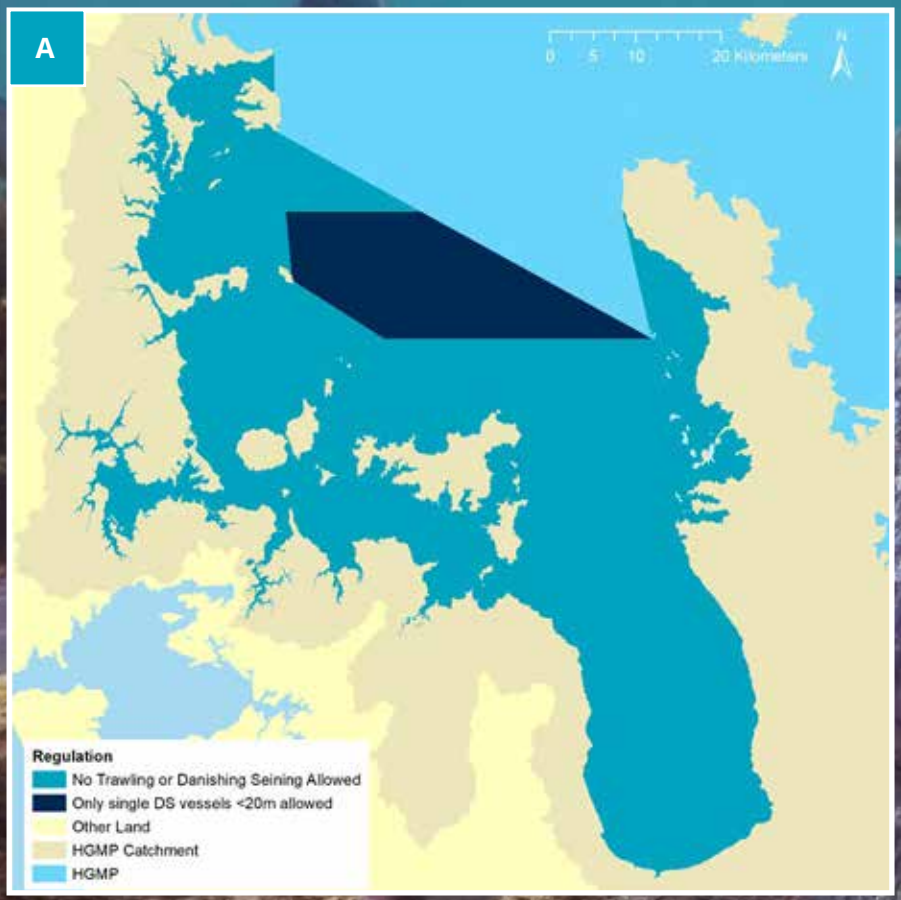
Figure 21: *Number of bottom trawls that occurred between a) 1996–97 to 1998–99, and b) 2016–17 to 2018–19 (data provided by Fisheries NZ).*

Anemones on a horse mussel. Photo by Shaun Lee.



Clown nudibranchs.
Photo by Shane Kelly.

Figure 22: *Number of Danish seine sets that occurred between a) 1996–97 to 1998–99, and b) 2016–17 to 2018–19 (data provided by Fisheries NZ).*



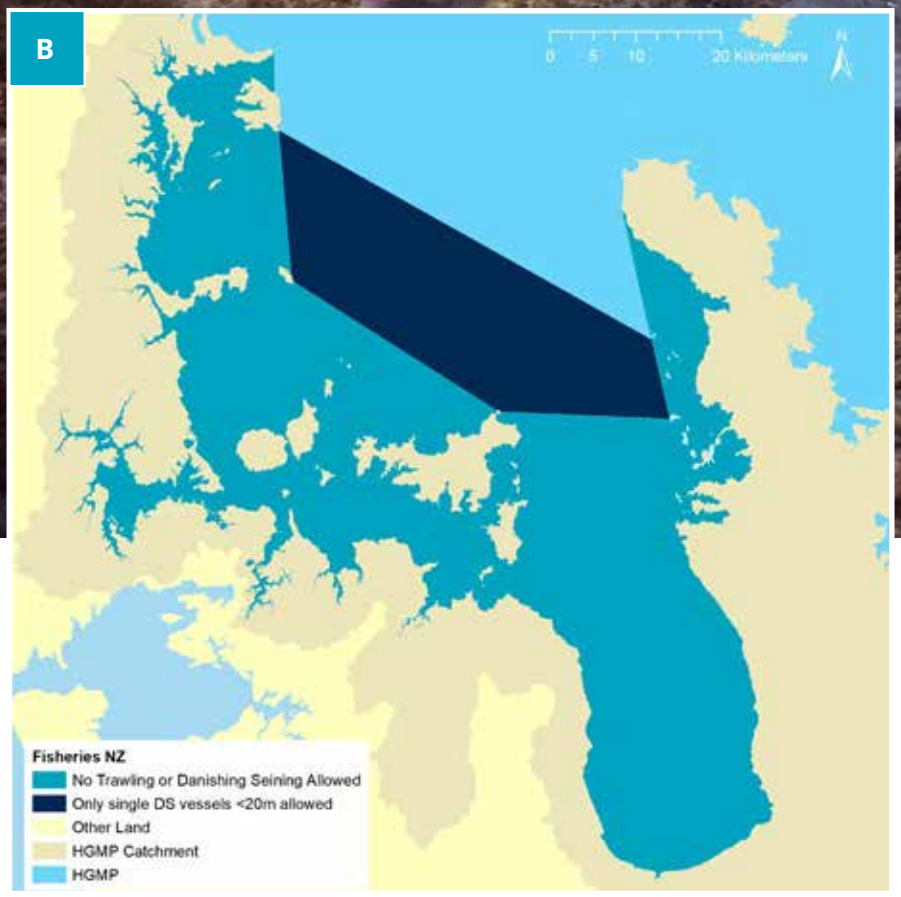


Figure 23: *Difference between: a) the restrictions prescribed in fisheries regulations for Danish seining, and b) the restrictions applied by Fisheries NZ.*

Tāmure. Photo by Shaun Lee.

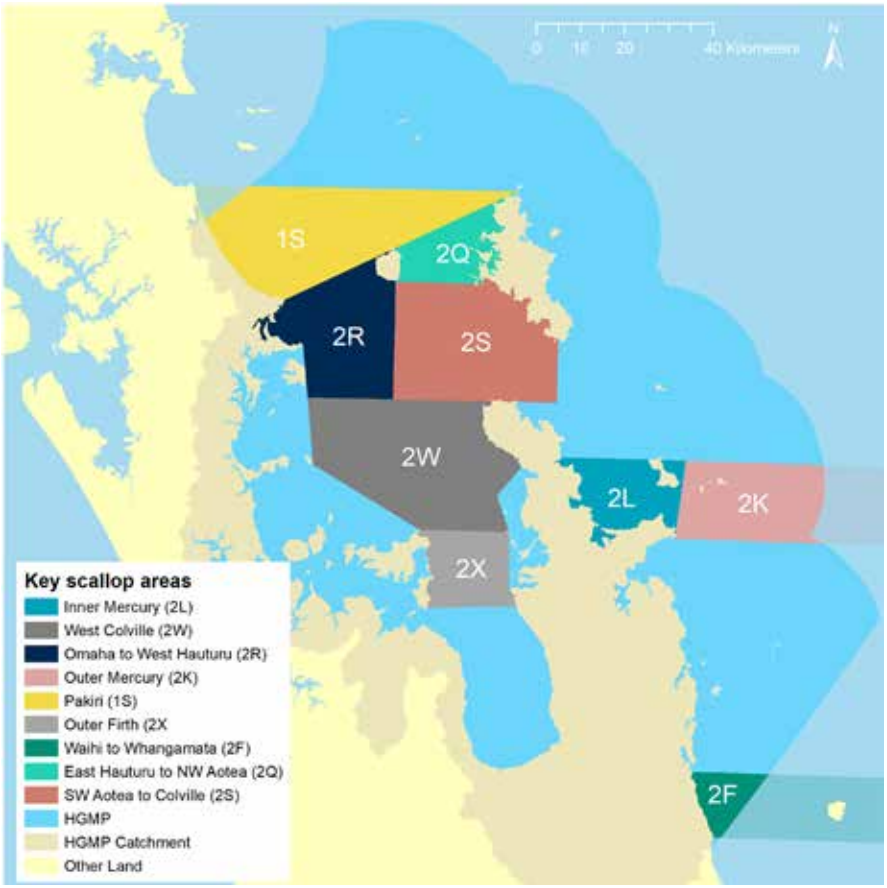


Figure 24: *Commercial tipa reporting areas.*

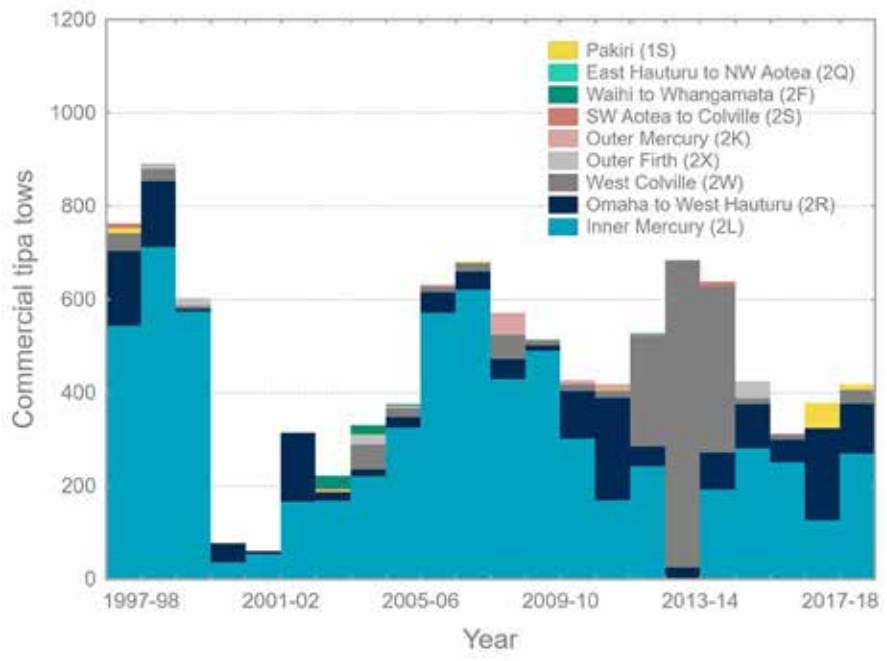
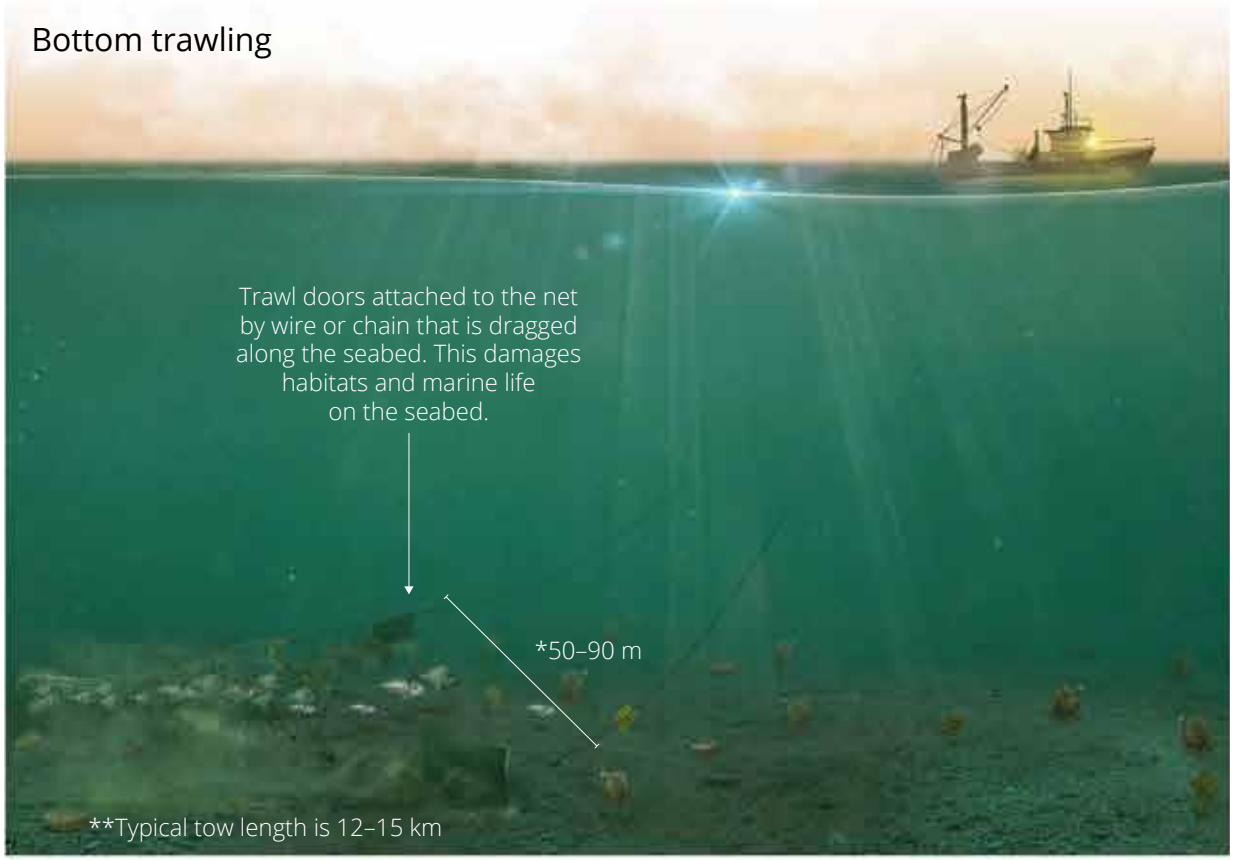
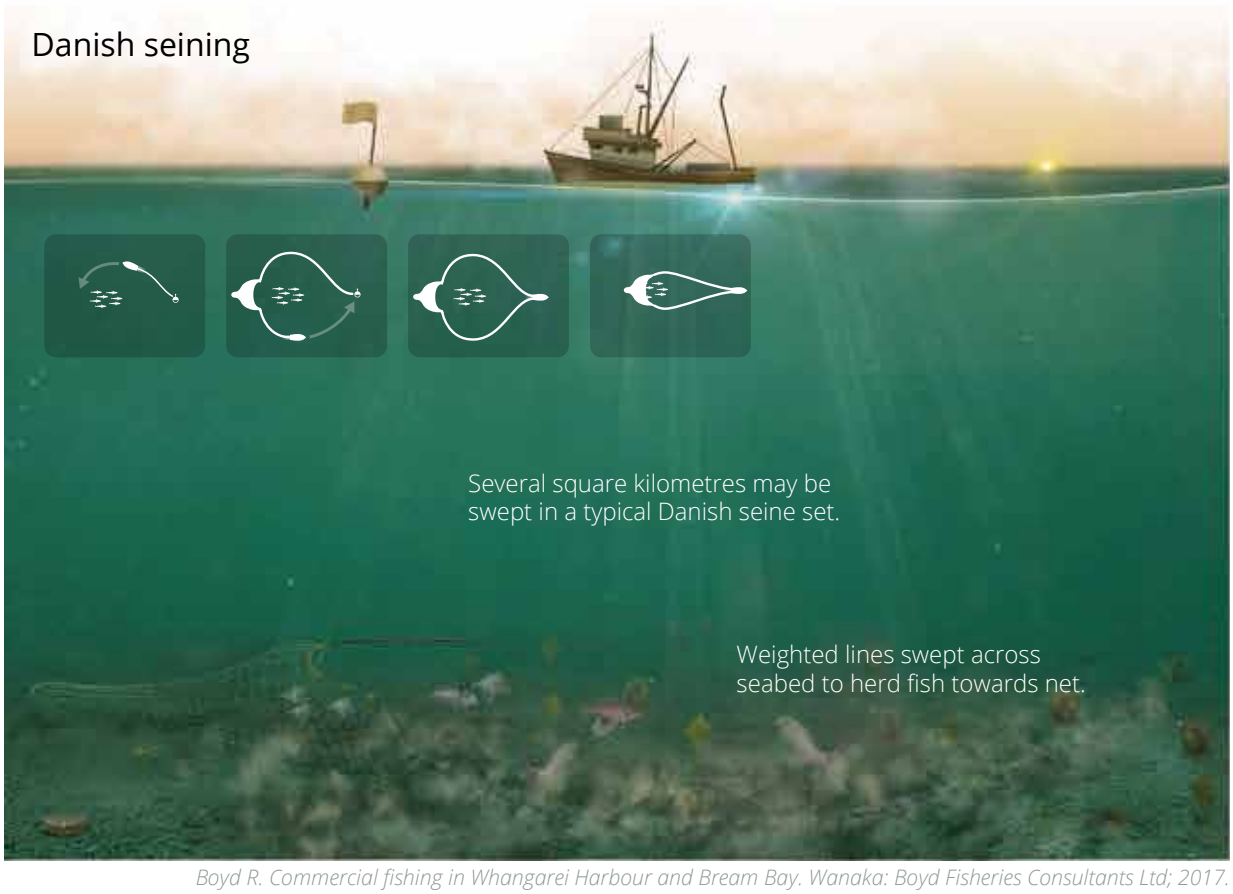


Figure 25: *Number of commerical tipa tows conducted in the Marine Park between 1997–1998 and 2017–18.*



**Baird SJ, Wood BA, Bagley NW. Nature and extent of commercial fishing effort on or near the seafloor within the New Zealand 200 n. mile Exclusive Economic Zone, 1989–90 to 2004–05. Wellington, New Zealand: NIWA; 2011.*
***Boyd R. Commercial fishing in Whangarei Harbour and Bream Bay. Wanaka: Boyd Fisheries Consultants Ltd; 2017.*



Boyd R. Commercial fishing in Whangarei Harbour and Bream Bay. Wanaka: Boyd Fisheries Consultants Ltd; 2017.

A chapter on the Motiti decision from the *State or our Gulf 2020.*

Read the full doccument here
https://gulfjournal.org.nz/state-of-the-gulf/

Grounded ship Rena on the Astrolabe reef October 2011. Photo by NZ Defence Force.

TE WHAKATAUNGA WHAKAHIRAHIRA A TE KŌTI MO NGĀ MAHI KINO, PAI RĀNEI, O TE HĪ IKA

Game changing court decision on the indirect impacts of fishing

It has long been assumed that regional councils could not address the effects of fishing under the Resource Management Act (RMA). The 'position' held was that the control of fishing and fisheries resources was specifically provided for in the Fisheries Act and could not be regulated under the RMA. However, a recent Court of Appeal decision has challenged this.

The Mōtītī Rohe Moana Trust (Trust) submitted on the Bay of Plenty's Proposed Regional Coastal Environment Plan in 2015 (Coastal Plan). That submission generally opposed the Coastal Plan's provisions for not complying with principles of the Treaty of Waitangi and for Council's failure to apply mātauranga Māori or engage with Māori connected to Mōtītī and its moana. The issues raised in the submission extended back decades, encompassed the entire rohe of the Mōtītī iwi, and largely revolved around the Council and the Coastal Plan being incapable of addressing chronic, long-term degradation of the moana through a Māori lens. Another key issue raised in the Trust's submission on the Coastal Plan was the effects of fishing on indigenous biodiversity[39].

At the Council hearing the Trust raised concerns about kina barrens arising from overfishing and submitted that the Coastal plan should address this. The Council's decision was that it didn't have jurisdiction to take measures that would impact on fisheries as this was managed under the Fisheries Act. The Trust appealed to the Environment Court, then the High Court, and most recently the Court of Appeal (Court). The issues under consideration boiled down to four matters of law. Among those were whether regional councils can exercise controls for RMA purposes that impact on fishing, and if so, can they perform that function only to the extent strictly necessary.

The Court of Appeal found that there is an overlap in the functions of regional councils under the RMA and those of the Minister of Fisheries under the Fisheries Act. The two statutes complement and ***"look at"*** each other. It concluded that biodiversity functions of the RMA were much broader than those of the Fisheries Act. The RMA ***"protects indigenous biodiversity not just as a resource but for its intrinsic value and for its ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values"***. The Court also noted that regional councils were assigned the primary governance role in maintaining indigenous biodiversity, stating:

"This brings us to a significant point, which is that the legislative history records that a choice was made not to establish this important function under the Fisheries Act for the coastal marine area but rather to assign it to regional councils under the RMA."

The Court also highlighted that decisions under one statute may be informed by decisions taken under the other. As an example, it noted that decisions on sustainability measures under the Fisheries Act, may be influenced by controls in a regional plan, or in a management strategy or plan under the Conservation Act (1987).

Overall, the Court found that the RMA does not prevent regional councils from controlling fisheries resources through their RMA functions, provided they are not doing so for Fisheries Act purposes. It also found that regional councils are not limited to exercising this function to ***"only when strictly necessary"*** when dealing with fisheries resources controlled under the Fisheries Act. While the decision had a strong focus on indigenous biodiversity, it could also be applied to other RMA matters affected by fishing (for example, natural character, geological features, historic heritage, and the relationship of Māori with their ancestral lands and waters).

The implications of this decision appear far-reaching, as the indirect or inadvertent impacts of fishing are known to be significant. In the Marine Park, these include impacts on seabirds, the seabed, and the functioning of reef communities. The questions now are:

1. Given that available information indicates that the indirect biodiversity effects of fishing on the Marine Park are significant, is the management of those effects a required, rather than a potential or optional, function of regional councils?

2. How and when will specific controls be incorporated into Regional Coastal Plans?

3. What will those controls look like and where will they apply?

4. Would coastal plan provisions need to be integrated with fisheries decisions, and if so, how?

5. What happens in the interim?

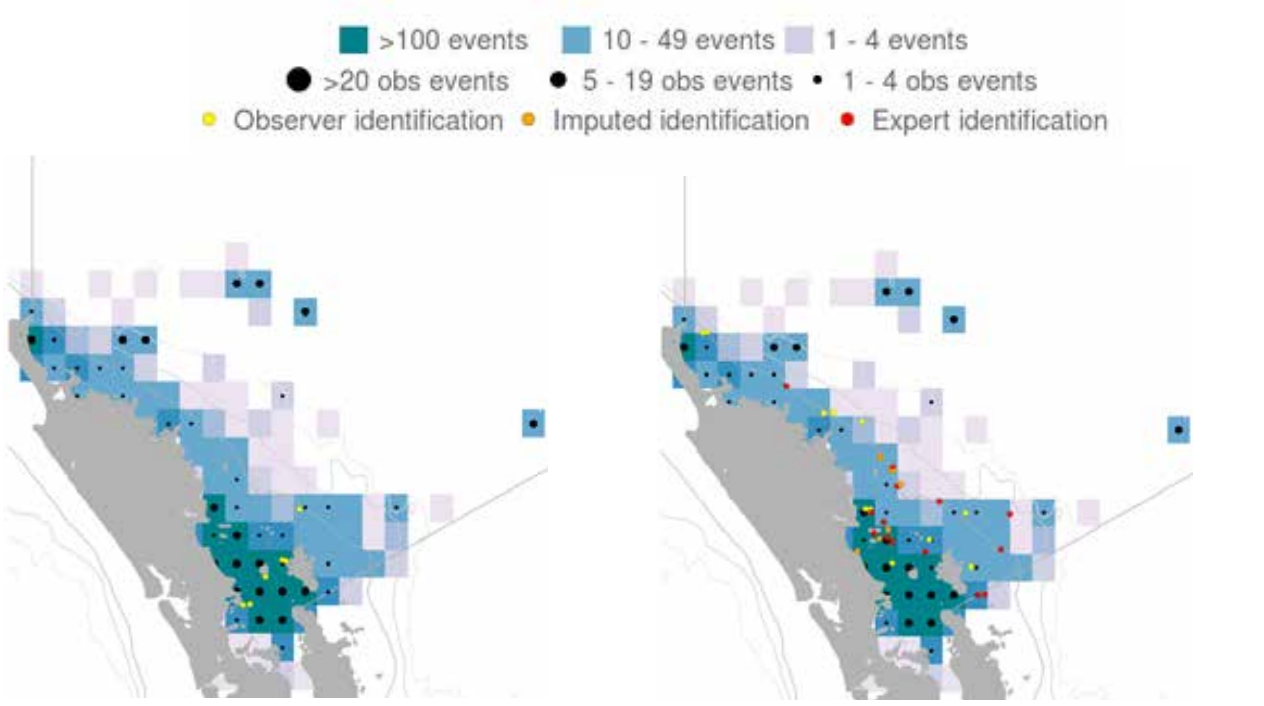
a. Do fishing activities currently require resource consents under existing coastal plans (for example under existing rules relating to activities that disturb the seabed or adversely affect significant ecological areas)?

b. If so, can activities that require consent continue prior to consent being granted?

Astrolabe Reef four years after the area was closed to fishing. Photo by Darryl Torckler www.darryltorckler.co.nz

Bycatch maps

https://psc.dragonfly.co.nz



Capture of whales and dolphins in trawl fisheries 2002–2018

Capture of all birds in trawl fisheries 2002–2018

Photos from Fisheries New Zealand obtained via OIA request.

Sea Change

Sea Change – Tai Timu Tai Pari directly addressed the problems facing the Gulf. Four years of collaboration between Mana whenua, Auckland Council, Waikato Regional Council, territorial authorities, the Department of Conservation, Ministry for Primary Industries, Stakeholders and the Hauraki Gulf Forum produced a plan to stop the decline of the Gulf.

However without central government leadership the 2016 plan has not been actioned. The Ministerial Advisory Committee established in 2018 to revive the plan took two years to deliver their report to Government in July 2020. Early consultation documents showed the plan had been significantly watered down with most of the suggested actions missing. Analysis of marine protection seems to have been limited to proposed areas rather than a network design approach. Seafloor fishing impacts are to be managed by a Central Government not Local Councils via a Hauraki Gulf Fisheries Plan under section 11A of the Fisheries Act 1996.

The Fisheries Act has failed to protect New Zealand indigenous biodiversity and has created local and functional extinctions. It is not the right tool for Ecosystem-Based Fishery Management (EBFM). If actioned it is likely to be sustainable in that it will hold the status quo (declined state) rather than restore abundance and diversity.

The Sea Change plan will only be partially actioned by this Government. Measures will be pronounced as the largest protection actions ever announced for the Gulf. This is likely to be true because only 0.3% of the Gulf is fully protected and the cable protection zones afford the most seafloor protection. Those who care about the Gulf will be pleased, but it will be like giving a band aid to a car crash victim. Fisheries New Zealand has been captured by industry (Parker 2016). There is hope of reform but no reason to wait, local Councils now have better tools, a mandate and the power to protect ocean biodiversity.

2008: State of the Environment Report. Challenges identified.

2012: Sea Change process begins.

2016: Sea Change report published.

2018: Ministerial Advisory Committee established.

2019: Motiti Decision.

2020: Ministerial Advisory Committee report to Govt.

2020: Auckland Council takes action regarding the Motiti Decision.

2021: ?

How the Motiti decision stopped mussel reef restoration

On the 27th of February 2020 Coastal Consents and Compliance officers announced that; as a result of the Motiti decision mussel reef restoration equates with the 'deposition of material' which in the Unitary Plan requires a resource consent.

The decision seems unjust because legal opinion was not sought on whether activities that destroy life on the seabed should also require a resource consent. The Mussel Reef Restoration Trust is working with Auckland Council to find a solution and until then the Trust is able to move its work into the Waikato.

This illustrates how easy it was for Auckland Council to effectively stop mussel reef restoration using the Motiti decision as the justification.

Coastal Consents and Compliance officers stopped restoration by announcing that restoration can't continue without a consent at a Shellfish Restoration Hui.

Shellfish restoration is not mentioned in the Unitary Plan but Coastal Consents and Compliance officers used Table F2.19.1 to justify their decision.

The Unitary Plan could provide much stronger direction to manage fishing impacts. But legislation in the plan may already exist for managing fishing that impacts the seafloor.

FOR EXAMPLE:

In the Unitary Plan Table F2.4.2, the first objective is that *"The adverse environmental effects on the coastal marine area from dredging are avoided, remedied, or mitigated."* In the activity table F2.19.4 Coastal marine area Disturbance, A42 states that *"Native vegetation alteration or removal, not otherwise provided for"* is a restricted discretionary activity meaning it requires a consent.

Much of the seafloor in the Auckland region is covered in a thin layer of algae (marine vegetation). It is impossible to trawl, dredge or Danish seine without disturbing this benthic habitat.

References

Peart 2016. Story of the Gulf by Raewyn Peart 2016

Macdiarmid 2016. A. B. Macdiarmid et al. 2016. Taking Stock – the changes to New Zealand marine ecosystems since first human settlement: synthesis of major findings, and policy and management implications

Consalvey 2006. M Consalvey et al. 2006. Information review for protected deep-sea coral species in the New Zealand region

ICES 1994. Report of the Working Group on Ecosystem Effects of Fishing Activities. Copenhagen 20-27 April, 1994. ICES C.M. 1994/Assess/ Env:1

Malcolm Clark Et al. 2019. The state of knowledge of deep-sea corals in the New Zealand region, Malcolm Clark, Di Tracey, Malindi Gammon, David Aguirre, Libby Liggins. 2019

NZ Geographic Nov-Dec 2019. ISSUE 160 https://www.nzgeo.com/stories/the-price-of-fish/

doc.govt.nz Protected Corals. https://www.doc.govt.nz/nature/native-animals/invertebrates/protected-coral/

Gulf Journal December 2017. https://gulfjournal.org.nz/article/well-done-burnsco/

Sea Change 2016. Sea Change – Tai Timu Tai Pari Hauraki Gulf Marine Spatial Plan

Rob Davidson et al 2010. Rob Davidson et al. Location and biological attributes of biogenic habitats located on soft substrata in the Marlborough Sounds. 2010.

Morrison et al 2016. Morrison, M. A, Tuck, I. D, Taylor, R. B and Miller A (2016). An assessment of the Hauraki Gulf cable protection area, relative to the adjacent seafloor. Prepared by the National Institute of Water and Atmospheric Research and the University of Auckland for Auckland Council. Auckland Council technical report, TR2016/004

Auckland Council staff feedback on proposals for an updated threat management plan for protecting Hector's and Māui Dolphin 2019. https://infocouncil.aucklandcouncil.govt.nz/Open/2019/09/ENV_20190910_AGN_6854_AT_files/ENV_20190910_AGN_6854_AT_Attachment_71411_2.PDF

State of Our Gulf 2020. Hauraki Gulf/ Tikapa Moana/ Te Moananui-a-Toi. State of the Environment Report 2020. Prepared by Kelly, S.; Kirikiri, R.; Sim-Smith, C.; Lee, S. Hauraki Gulf Forum, Auckland, New Zealand.

Sam Sachdeva 2019. https://www.newsroom.co.nz/2019/09/13/805461/us-seafood-ban-plan-causes-stir-in-nz

MAUI TMP 2019. https://www.mpi.govt.nz/news-and-resources/consultations/hectors-and-maui-dolphins-threat-management-plan-review/

Rescue Fish 2020. https://rescuefish.co.nz

MPI AEBAR 2018. MPI 2018 https://www.mpi.govt.nz/news-and-resources/open-data-and-forecasting/fisheries/

Parker 2016. Hon David Parker https://www.parliament.nz/en/pb/hansard-debates/rhr/document/HansS_20160920_054787000/parker-david

Tuck et al 2017. Assessing the effects of fishing on soft sediment habitat, fauna and process.

New Zealand Inshore Trawl Fishery Report 2017. Seafood Risk Assessment. New Zealand Inshore Trawl Fishery. MRAG Asia Pacific.

Hague 2020. https://www.stuff.co.nz/environment/122895114/trawl-gear-damages-fragile-coral-reefs-so-why-is-the-government-sanctioning-more-hauls