

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Wednesday, 26 October 2022 6:17 pm
To: Sea Change
Subject: Submission: Help Revitalise the Gulf

:

seachange@doc.govt.nz

Your Name: s 9 (2)(a)

Your Email: s 9 (2)(a)

Address: s 9 (2)(a)

Subject: Submission Revitalising the Gulf

Message

Please protect the Hauraki Gulf by not allowing bottom - trawling or sand mining, which are both highly destructive to the marine ecosystem and are antiquated practices.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Wednesday, 26 October 2022 6:49 pm
To: Sea Change
Subject: Seachange submission
Attachments: Scan0605.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded, Reply sent



[OCEAN DREAM CHARTERS LTD](#)

s 9 (2)(a)

s 9 (2)(a)

To Whom It May Concern,

Please find attached submission.

Kind regards,

s 9 (2)(a)

Seachange
Department of Conservation
Seachange@doc.govt.nz

25 October 2022.

Submission on proposed High Protection Zones in the Hauraki gulf

My/our concerns about this process and the proposal itself can be summarised as follows:

It is not democratic

- Very little time has been given for people to hear about, understand and respond to these marine protection proposals .
- The source documents are complex and the most important information about the size and reach of the proposed High Protection Areas are located in the appendix (slides 124 to 142) of a 144 page report
- Not all relevant stakeholders or intermediaries between the proposal and the affected groups have been directly contacted by DOC or HGF to alert them to this proposal. For example bait and fishing supply shops had no idea of this proposal yet it is their customers who will be directly affected by the establishment of no fish zones around the inner gulf areas including 50 km² area around the Noises.

It is potentially very divisive.

The proposal expressly prevents any recreational or commercial fishing in these areas but allows for :

The customary practices of mana whenua, including customary non-commercial fishing, will be provided for within HPAs. Customary practices will be managed to achieve the biodiversity objectives agreed with mana whenua for each site. Protected Customary Rights (PCR) and Customary Marine Title (CMT) recognised under the Takutai Moana Act will be unaffected.

Inevitably this will be reinterpreted as two different sets of rules for the same area of water that was once accessible to all. There is no guidance within the documentation on how this work in practice in large areas such as the Noises (50 km²) or the Motukawao Group (30 km²) which is a very popular and productive fishing area across all cultural groups, Maori, Pakeha, Pacifica and Asian

It inconsistently applies its own guidelines to justify the HPA's .

The purpose of the High Protection Areas is to *support the recovery of some of the most biodiverse regions in the Gulf.*

Some of the most at risk marine ecosystems include scallops, crayfish and the loss of kelp forests, in part, to a greater or lesser extent, due to the encroachment of kina.

Yet few of the detailed assessments outlining the ecological objectives and justification for an HPA specifically mention the protection or restoration of scallops or crayfish and in some cases the report acknowledges that *most of the soft-sediment habitat within the area has unknown values; it is thought to be dominated by mud substrate (Motukawao group)*.

Nor is there any data or observations that set the benchmark on how the establishment of the specific HPA's will improve the pre-HPA ecosystems around these areas.

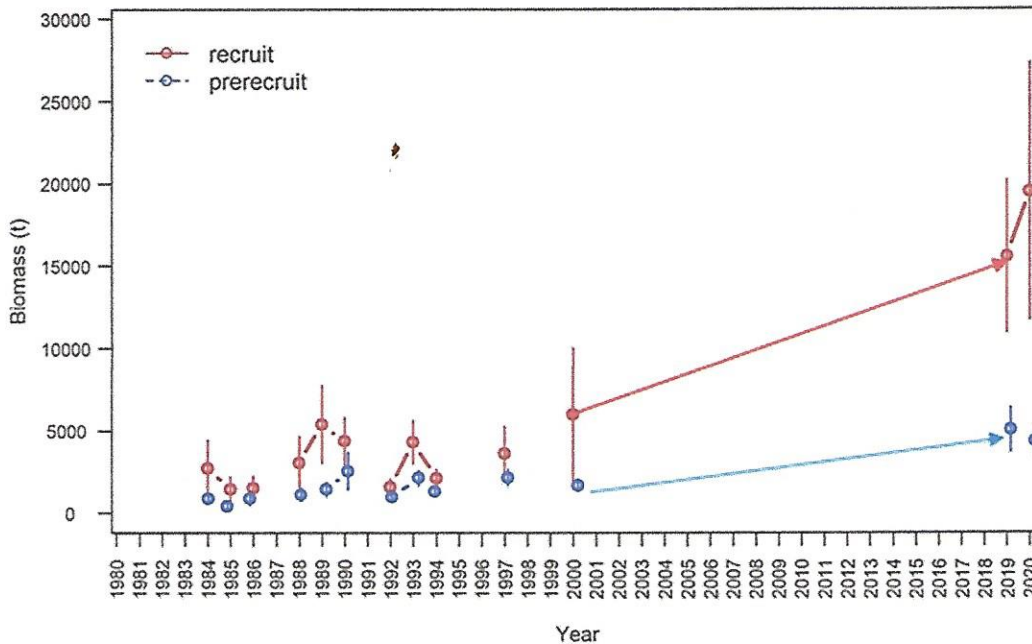
Part of the fundamental rationale for the establishment of these HPA's are out of date or no longer apply .

Much of the work on the establishment of these HPA's began 6- 7 years ago; well before the Gulf wide government moratorium on scallop collection or dredging, or collection of crayfish or the establishment of rahui to protect coastlines. But the rationale for these HPA's do not reflect these important advancements in the protection of sea-life and the sea floor.

The narrative of the DOC proposal and its supporting documentation also predates the publication of the NIWA trawl survey data in 2021 that shows snapper stocks and many other species have significantly recovered over recent years .

See slide below :

Fishery independent trawl surveys



HPA's are not strategically aligned to solving the biggest future threat to the Gulf .

With the reduction of commercial fishing pressure, decreases in recreational bag quota and the moratoriums on crayfish and scallop harvesting the pressure on the future of the Hauraki Gulf increasingly shifts towards land based, not sea-based activities.

The biggest threat to the recovery of the Gulf is sedimentation; from rural and forestry-based activities in the Waikato and Coromandel catchments and the rapid development of rural land for housing and commercial developments along the northern and southern coastlines of the Auckland region.

The increasing rate of subdivision, combined with higher frequency high volume rainstorms has accelerated the flow of sediments down the many streams and rivers to the estuaries that feed into our coastlines from Long bay north to Leigh, and on Waiheke Is land . And the extension of the northern motorway is only going to push that rate of sedimentation along the very coastline that feed into the HPAs for Tiritiri Matangi; Mahurangi, Kawau Is land right up to Goat Is land itself. If we need to see what the future of suffocating sedimentation looks like, visit Long Bay reserve after a storm, or compare the health of the Waitemata harbour to what it was 6 years ago.

The danger is that the establishment of HPA's creates an illusion of protection and revitalisation when sedimentation will continue to spread across the Gulf irrespective of these new boundaries.

In summary the proposed creation of these HPA's is:

- based on out of date data and assumptions about the biggest threats to the Gulf,
- the process for gathering feedback is undemocratic
- the establishment of the HPA's is potentially very divisive between manu whenua Māori and other long established groups of gulf users.
- Will not solve the fundamental problems facing the health of the Hauraki Gulf, which are now fundamentally land based.

Thank you, for your consideration.

Regards

s 9 (2)(a)

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s 9 (2)(a)

OCEAN DREAM CHARTERS LTD 26-10-22

s 9 (2)(a)

Sea Change

From: s 9 (2)(a)s 9 (2)(a)
Sent: Wednesday, 26 October 2022 7:16 pm
To: Sea Change
Subject: "Support for Revitalising the Gulf"

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Reply sent, Recorded

Name: s 9 (2)(a)

Contact: email

I support the sea change, but feel it is too little too late.

I am a recreational fisherman myself and I personally would prefer to see you draw a line from bream head to Cape Colville and

1. stop all commercial fishing immediately. For 5 years to let the stocks properly replenish
2. Reduce bag limits for recreational to 3 fish of legal size per day per person of any species for the next 5 years and introduce the same bag limits for customary fishing.
3. After 5 years and if stocks have sufficiently recovered, allow long line fishing for commercial vessels inside the area outside of spawning season. Never let nets back in.
4. Increase bag limits when fish stocks have returned to proper levels.
5. Commence a programme of reseedling the harbour beds with shellfish, you can employ the out of work trawlers.
6. Even up the sizing so trawlers need to meet the same minimums as recreational fishers.

Sent from my Galaxy

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Wednesday, 26 October 2022 7:38 pm
To: Sea Change
Subject: Hauraki Gulf protection zoned

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded, Reply sent

- s 9 (2)(a)
s 9 (2)(a)

- I support 100 percent Seafloor protection for the whole of the Hauraki Gulf to support the regeneration of our sea flora and fauna.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Wednesday, 26 October 2022 8:09 pm
To: Sea Change
Subject: Submission Hauraki Gulf
Attachments: Help save the gulf s 9 (2)(a) docx

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Reply sent, Recorded

Ma mahi, ka ora

s 9 (2)(a)
Archaeologist
s 9 (2)(a)

Cell: s 9 (2)(a)
Email: s 9 (2)(a)
s 9 (2)(a)

s 9 (2)(a)

s 9 (2)(a)

26 Oct 2022

This is a private submission.

Help revitalise the Hauraki Gulf!

The proposed areas of high protection are too small. The only way to enhance the gulf is to restrict the volume of the fishery. Protected areas assist with that but restrictions on catch are needed as well.

Seabed protection is slightly better and appears to mean no bottom trawling. That is good. Why not restrict fishing methods as well such as long line.

The placement of the HPAs is good and builds to an extent on existing protection.

There is nothing here about enforcement and increased staffing and resources for enforcement agencies. There is nothing about audit of the effectiveness of customary protection and customary take.

I strongly support the extension of protection areas in the Cape Rodney and Kawau areas.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Wednesday, 26 October 2022 8:23 pm
To: Sea Change
Subject: Submission on revitalising the gulf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Reply sent, Recorded

I support the proposals to increase protection in the Hauraki Gulf.

Sand mining, bottom trawling and other fishing practices which disturb the seafloor extensively should be further limited with targets to phase them out in the future.

I am submitting this as an individual.

s 9 (2)(a)

s 9 (2)(a)

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Sent from MetroMail

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Wednesday, 26 October 2022 9:17 pm
To: Sea Change
Subject: Bottom Trawling

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded, Reply sent

I would like to add my voice to those who want to see an end to bottom trawling fisheries in the Hauraki gulf and indeed around all of NZ coastline. It is an environmentally devastating practice that destroys the sea floor flora and fauna as well as releasing huge amounts of green house gases. I strongly request our leaders and government stop this practice immediately.

Thanks for listening and your action towards protecting our environment and supporting the future for our children.

s 9 (2)(a)

Child, Adolescent, Family & General Psychiatrist. Email: s 9 (2)(a)
Mob s 9 (2)(a)

Sea Change

From: s 9 (2)(a)s 9 (2)(a)
Sent: Wednesday, 26 October 2022 9:20 pm
To: Sea Change
Subject: Submission - Hauraki Gulf Marine Protection Proposals

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Reply sent, Recorded

Name: s 9 (2)(a)

Contact details:

s 9 (2)(a)

(Pakeha and Te Rarawa)

I fully support ALL the proposed marine protection areas for the Hauraki Gulf in the documents here <https://www.doc.govt.nz/haveyoursayonthegulf>

Other than that I would say they are far too little, both the HPAs and the SPAs.

I grew up on the North Shore and Whangaparaoa, the sea life wasn't in great shape then, and now it's just decimated. Snorkelling at local reefs held some attraction in the 1960-70s but now is just sad and depressing. They are so empty, and although sedimentation is an issue, it's mostly about overfishing, low abundance, scared fish, and no diversity. Both we and the fish deserve better.

Access to HPAs:

- Not only does the marine environment of the Gulf desperately need more HPAs, but the people need many more and most importantly in areas with road access!
- As far as I can tell from the map, only one of the proposed HPAs has road access
- This means only the affluent and privileged who have a boat or can afford a tourist boat can get to them, it's a travesty of furthering inequality.
- Kiwi's have a right to be able to experience a living ocean at their local reef!
- **So YES to the proposed HPAs, and encouragement to put some where people can get to them**

Customary Take:

- While I understand the sovereignty issues, I believe that NO fishing should be allowed in the HPAs for many years if not decades.
- Food sovereignty doesn't exist in an empty moana
- The depleted state of our oceans is too perilous to allow take from this very tiny percentage of the Gulf, just fish down the road.
- I am very concerned that if Maori are seen fishing in the HPAs pakeha fishers will not respect them and will just fish in them anyway, they already struggle to respect the current tiny closed areas we have.

Seafloor Protection Areas

- I'm in full support of the proposed SPAs

- But seriously why so few and so small.
- In the media the fishing industry has been saying they will now only be fishing in "corridors" in the Hauraki Gulf, making it sound like most of the seabed communities will be protected. This clearly won't be the case.
- Why not protect the Gulf and create some actual "fishing corridors" for the commercial fleet
- BTW Corridor Definition & Meaning - ***a usually narrow passageway or route.*** Merriam-Webster Dictionary

Get these done, and then get on with some REAL protection to actually revitalise the Gulf !!!

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s 9 (2)(a)

M. s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Wednesday, 26 October 2022 10:27 pm
To: Sea Change
Subject: Submission: Help Revitalise the Gulf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Reply sent, Recorded

:

seachange@doc.govt.nz

Your Name: s 9 (2)(a)

Your Email: s 9 (2)(a)

Address: s 9 (2)(a)

Subject: Submission Revitalising the Gulf

Message

As a diver with over 40 years experience I have seen the decline in oceanic life in the Hauraki Gulf
I can remember getting scallops of Browns bay or spending a few hours on a fishing and diving trip returning with a feed of Snapper Kawai Scallops and Crayfish around the Noisies and Waiheke
My greatest regret is not being vocal enough about dumping of dredging spoil and allowing silt runoff from sub division s spoiling our beach's and sea plant life
I have also been witness to the Kina barrens spreading across the Gulf due to trawlers and man indiscriminately removing the predators that keep nature in balance.
I have seen the impact of marine reserves and rahui can can have on our ocean play ground and support what it takes to help nature to naturally repair and rebuild man's destruction of the Moana .

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Wednesday, 26 October 2022 11:55 pm
To: Sea Change
Subject: Revitalise the Hauraki Gulf Submission

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Reply sent, Recorded

Kia ora,

My name is s 9 (2)(a) I am a stakeholder of the health of the Hauraki Gulf by virtue of a) growing up and still residing in Auckland, b) being a competitive sailor and spending 10 000 sailing, competing, and coaching on its waters, c) being a member of sailing clubs, and educating child and adult learn-to-sail programmes in different areas of the Gulf, d) taking the Devenport ferry as part of my commute, e) using a 30ft yacht to holiday around the Gulf at least once a year, f) enjoying diving

I wish to convey that much more action needs to be done for meaningful conservation, and fast.

General feedback

- The Sea Change plan began its life almost 10 years ago and there is still very little to show for improved outcomes for the Gulf. I am aware of some of minor recent progress but I do not believe that central and local government are moving fast enough to improve the mauri of the Gulf.
- I do not regard Cable Protection Zones as meaningful marine life protection, therefore I do regard the 17.6% figure as stated by the report as meaningful.
- The international best-practice target is 30% for highly protected areas, so for the government plan to be 10 years in the making and a) not target 30% protection and b) inflate the 'protection' area with weak protection zones (such as the cable protection zone) is **not acceptable**.
- Very supportive of a move to ecosystem-based management. Do this quickly.
- Create a beautiful, living legacy of a thriving Gulf!!

Fisheries management:

- I agree with the written outcomes
- recreational fishing is an extremely important area to regulate well. Cumulative effects are significant and there are reports of insufficient fisheries officers to enforce bag limits. I want all recreational fishers to require a license through a fishing club that ensures education about the ecosystems in the gulf, fishing rules and fishing areas.
- Bottom trawling should be severely limited in the Gulf.
- Fisheries rules should be easy to understand to help compliance. Therefore, I recommend large, no-take marine reserves, and total bans of the worst fishing practices in the Gulf. Low impact commercial fishing could be allowed provided ecological limits are not passed, otherwise the fishery should close.
- To support the habitat restoration and other six areas, fishing management must be very strong.
- Review, rewrite and update the Fisheries Act 1996 to enable ecosystem based management of all fisheries.
- Transition the Quota Management System (QMS) to an ecosystem-based approach that enables the interactions of all species, their environment, and the interactions between trophic levels to be addressed in management to ensure fish, shellfish and associated and dependent species populations are maintained at ecologically healthy, resilient levels.

- Support all commercial fisheries to transition to operate with verifiably best practice methods and equipment that minimises ecological impacts, including avoiding bycatch of protected species, and carbon release from sediments, and that fishing occurs within agreed take areas.
- Reduce ghost fishing gear by mandatory marking, and disposal facilities
- Set a target of zero fishing-related mortality of marine mammals, turtles, seabirds, and other protected marine species, for all fisheries, set interim mortality limits for these species and close fisheries as soon as a limit is reached.
-
- Marine predators such as sharks, whales, dolphins, rays, and seals should have very high protection

Habitat Restoration

- Support the vision and proposed actions.
- Do this as quick as it biosecuritarily safe to do

Aquaculture

- Aquaculture of seaweed and other species that create and restore ecosystems WITHOUT introduction of feed should be prioritised.
- Research and create 'blue carbon' sequestering opportunities

Support appropriate financial mechanisms (e.g. resource rentals) so that users of coastal waters (e.g. marine farmers) pay a use or occupation charge for private commercial use of public coastal and marine space and ensure the funds raised support sustainable management.

Marine Protection

- There should be a 30% **no-take** marine reserve plan. You have proposed 0.3% (i.e. no significant change) which is **dismally low**.
- Areas with permissible customary fishing (e.g. high protection areas/MPA 1 zones) should be on top of the 30% no-take areas.
- Marine protection should not only protect 'special and rare' areas, but also regular, typical marine areas. See Dr Bill Balantine's book on Marine Reserves
- Although I support Te Tiriti and customary fishing, I do not support this to be available in all parts of NZ waters. By heavily protecting no-take marine reserve areas, the Crown **would be supporting Māori fishing rights**, ensuring those rights are preserved for generations to come by a) restoring the mauri of the Gulf, and b) by spill-over species from the marine reserves and c) allowing better studying of undisturbed marine ecosystems.
- Update the Marine Reserves 1977 Act to speed up the creation of a coherent network of marine reserves covering exceptional and standard areas of marine ecosystems

Protected species

- The actions described are almost entirely theoretical/bureaucratic and are not practical steps to reduce bycatch/improve protections
- The minister should use their powers to directly implement recovery plans for all species in decline (including seabirds). Biodiversity of 100+ years ago should be the target, including sponges, seals, whales, seabirds, shellfish and fish species. This should happen under 'manage' and in 1-2 years.

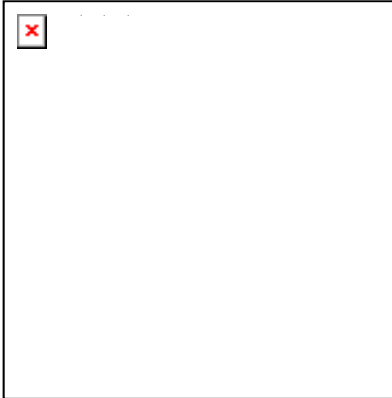
Ahu Moana

- Looks good.

Governance

- Although I am supportive of increasing the powers of the Hauraki Gulf Forum in the medium term, I think in the short term we need to actually get the work done of improving the Gulf with the resources available to us.
- An Oceans Ministry should be set up rather than a Cross-Agency group (long term)

Thanks for your time and work towards this crucial matter.
Kind regards,



s 9 (2)(a)
([he/him](#))

Marketing

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 6:32 am
To: Sea Change
Subject: Bottom Trawling and Mining

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

My family is opposed to bottom trawling and mining any of the Hauraki Gulf, as it essentially obliterates all eco-systems. I do not agree with special access being granted to one group of people as I see it as being a form of apartheid.

We also want the area off Pakiri / Mangawhai to be designated a Special Protection Area to stop sand mining off the shores of Pakiri and Mangawhai. The impact of further mining will be detrimental to the beaches and dunes of this area and Mangawhai Harbour.

Thank you

s 9 (2)(a)
s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 7:00 am
To: Sea Change
Subject: Hauraki Gulf Proposal

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Hi all,

In general I support the proposed change BUT would like to ensure that the seabed protection areas do not prohibit recreational diving / fishing and catching scallops/crayfish by hand up to agreed bag limits.

The stock levels will benefit from reduced commercial catching and can be better managed by fisheries with changes to the bag limits if needed rather than a blanket approach.

Regards s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 7:42 am
To: Sea Change
Subject: Remove the High Protection Areas from the proposal

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Cheers

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 7:51 am
To: Sea Change
Subject: Submission - Revitalising the Gulf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Our family enjoy the Hauraki Gulf from our yacht and have noticed the real deterioration in water quality and bio diversity. This is a genuine crisis needed genuine leadership.

I support the establishment of 19 new protected zones including 12 High Protection Areas, 5 Seafloor Protection Areas and 2 protected areas (marine reserve extensions) adjacent to Whanganui-a-Hei and Okakari Point.

However I believe this does not go far enough. I believe bottom trawling and seabed mining have NO PLACE in New Zealand waters.

Therefore I believe both practices should be banned outright in the ENTIRE Hauraki Gulf area.

This is the only way our family will see improvement in water quality and bio diversity.

Ngā mihi nui

s 9 (2)(a)
s 9 (2)(a)

s 9 (2)(a)

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 7:53 am
To: Sea Change
Subject: Submission on "Revitalising the Gulf" proposal

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Thank you for the opportunity to make this submission.

My submission on this is: Please remove all references to the Treaty of Waitangi and Iwi involvement.

Reason: It is not complicated. As far as I am aware New Zealand is still a democracy in which we are all equal. New Zealanders marched on the streets to oppose apartheid in other countries – why are we introducing it here? While the entire world is preaching equality why is New Zealand marching resolutely backwards towards discrimination? This proposal as currently drafted takes us further along this road backwards to darkness.

Thank you

s 9 (2)(a)
s 9 (2)(a)

Sent from [Mail](#) for Windows

Sea Change

From: Meadowbank School Marine team s 9 (2)(a)
Sent: Thursday, 27 October 2022 8:07 am
To: Sea Change
Subject: Submission: Help Revitalise the Gulf

:

seachange@doc.govt.nz

Your Name: Meadowbank School Marine team

Your Email: s 9 (2)(a)

Address: s 9 (2)(a)

Subject: Submission Revitalising the Gulf

Message

s 9 (2)(a)

We have visited Goat Island Marine Reserve with EMR. Visiting the reserve opened our eyes as we saw lots fish and sustainable ecosystems. Seeing this made us care alot about marine reserves and other habitats and we think how incredible it would be if everybody got the experience.

When we visited Goat Island we were amazed by the clarity of the water and the diversity of the species, combined with the balance of the ecosystem. It really showed us what a healthy ecosystem looks like, not only underneath the water but also in the rock pools and other bodies of water like the streams that fed into the ocean.

We saw so many fish species; eagle rays, spotty, snapper, eleven armed starfish, crabs and a forest of kelp. It really shocked us how many species lived there compared to our local beaches. Personally it was a real eye opener, seeing the difference between a protected and unprotected area. This motivated us to take action and spread awareness. Finally, if we had more marine reserves, we could get people to realise the impact of marine reserves, not only for the creatures but on people's point of view. Establishing more reserves will not only introduce new species but let others species thrive and get people excited and passionate about the health of our ocean and land At our local beaches you can barely ever see fish and most of the seaweed is just washed up on the beach. Extending our marine reserves will motivate our people to care, similarly it will motivate anyone else (tourists) who visits us. It's crucial. if we don't act now it will be an inevitable that the health of our ocean will decline.

s 9 (2)(a)

We enjoyed learning about healthy water ecosystems with EMR during our visit to Goat Island Marine Reserve and we would like to share some of what we experienced.

I was expecting less of this marine reserve. It was awe-inspiring to experience the difference in this ecosystem and environment, compared to our local beaches.

It was beautiful swimming though the healthy water. Snapper poked in and out of the swaying kelp forests. Blue Cod and Red Moki mingled around each other. There was also an enormous amount of kina feeding on the kelp.

If we increase the amount of marine reserves in the Hauraki Gulf, then our local ecosystems will thrive. Also, if there are more reserves, more of the public can feel and see, what I felt and saw, and will do what I did - take action to protect it.

I think it would be amazing to be able to just bike down to the beach with my friends and my snorkel gear, and feel what we experienced at Goat Island. I think it is crucial that we increase the marine reserves around Hauraki Gulf.

IT'S NOW OR NEVER!

s 9 (2)(a)

We have visited goat island marine reserve with EMR.

Before we went to goat island, we weren't aware of how much diversity can form when an area is protected. We really enjoyed seeing a wide variety of species from golf ball sponges to blue eyed triplefins. We saw species that we could have only ever have imagined of but when we saw them in person it was wonderful. Many fish were confident to swim up to us because they know that they are safe from fishing at Goat Island.

In our local beaches we swim in very murky water: the occasional small fish are so scared to go near anyone, plenty of pollution is scattered both in the ocean and on the sand. This especially encouraged us to take action to protect marine areas in our local community and to decrease litter. At Goat Island we saw a huge population of diverse marine life as we swam over forests of kelp. We saw eagle rays, snapper, jellyfish, piper fish, red moki, leather jacket fish, kina and the eleven armed starfish. After I had submerged my head under the icy water, I glimpsed a long thin object slithering behind the kelp, At that point my curiosity took over, so of course I swam over. To my amazement I saw a elegant eagle ray gliding away, my jaw dropped, and for a while I stared at the spot it had disappeared at, Undoubtedly that was the best experience ever.

Currently in the whole Hauraki Gulf there is only 0.3 percent protected. So without a doubt we think there should be more marine reserves in the hauraki gulf. Firstly to protect endangered and threatened species to stop them plummeting down the cliff of extinction, Secondly to repopulate uncommon species that can help balance the natural ecosystem, and thirdly so that more species will thrive. If the idea is accepted we will be protecting a whopping 17.7 percent more than previously. We think this will impact other people and they could help other parts of the world in our road trip towards an eco friendly earth and healthy oceans worldwide.

s 9 (2)(a)

We have visited Goat island and Poor knights with EMR. We enjoyed looking at a healthy ecosystem and a good role model for other ecosystems.

We saw the astounding difference between protected and unprotected areas; the amazing diversity of the ocean animals found there and the substantial size difference between fish in our local environment and the protected environments. We saw an immense assortment of fish that we would not see in our local environment like: Eagle Rays, Stingrays, eleven armed starfish, blue maomao, Kelp, Piper, Trevally, Blue eyed triplefin, spotty, Blue cod. We also heard the kina. When we poked our heads into the thick green kelp, we found a monstrosity of a crayfish staring at us. Annoyed at the whole poking ordeal, we were so surprised we nearly swallowed our snorkels out of fright. I had never seen a crayfish that well feed!

We should create more protected areas in the Hauraki Gulf for the following reasons:

Firstly, if we create more marine reserves closer, people can then truly experience the beauty of a protected marine environment easily and they will hopefully be motivated to join us and protect this stunning environment

Secondly, the protection in these areas would increase the variety of marine animals and as a result, our ocean life would thrive.

Thirdly, we know that whatever we do in our oceans in New Zealand affects the ocean globally. So we have this responsibility to take action and keep our water healthy.

Finally, we would love to take trips to different areas in New Zealand and experience what we experienced at Goat Island and the Poor Knights.

s 9 (2)(a)

We have visited Goat island with EMR. We enjoyed seeing all the breathtaking diversity of their ecosystem, and would like to see more of this around NZ. It helped us to set the standard for how amazing the ocean could be. While snorkeling around Goat Island, the visibility level was high, But at our local beaches, we can't even see our feet in knee length water. There is also a disappointing lack of fish at our local beaches. Surprisingly, at Goat island there was an enormous amount of snapper, red moki and kina but less of other species. It was rather like a game, dodging any passing fish and floating jellyfish. The kelp forests were flourishing and we were fascinated by the fact that a healthy ecosystem could have a certain dominating species.

The proposal of more marine reserves in the Hauraki Gulf is an excellent idea. We want the local citizens of Auckland and its surrounds to experience what the ocean has to offer. We must take action NOW! Our wish is to let the endangered species recover and re-balance the ecosystem. People need to actually see what the ocean could become to feel motivated to take action. Adding more marine reserves and protected areas that are accessible to people would help with that. We must be more civilized and take better care of our earth .

It is imperative that we act now before things take a turn for the worse.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 8:12 am
To: s 9 (2)(a) Sea Change
Subject: Re: Submission on Revitalising the Gulf Marine Protections proposal - jOHN white

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Thank you for your reply.

Please only publish this amended response.

My name is s 9 (2)(a) I reside in s 9 (2)(a) New Zealand .I support the Gulf Marine Protection Package proposed to establish new marine and sea floor protection areas in the Hauraki Gulf Marine Park.

The health of the gulf is important to all of us who have the opportunity to enjoy all the recreation activities and wild life the Hauraki Gulf.

We now have a Mayor in Auckland with the ability and determination to lead and achieve protection of our sea waters and the fresh water assets which directly impact on the quality our sea shores.

The Department of Conservation will also get full support from Auckland people in their practical preservation work.

s 9 (2)(a)

s 9 (2)(a)

From: [Revive Our Gulf on behalf of jOHN white](#)
Sent: Wednesday, October 26, 2022 7:32 AM
To: seachange@doc.govt.nz
Subject: Submission on Revitalising the Gulf Marine Protections proposal - jOHN white

Kia ora DOC,

My name is s 9 (2)(a) . I reside in s 9 (2)(a) s 9 (2)(a)

I support the Revitalising the Gulf, Marine Protection Proposals package to establish new marine and seafloor protection areas in the Hauraki Gulf Marine Park / Tikapa Moana / Te Moananui-ā-Toi (the Gulf). I encourage Ministers to proceed as quickly as possible to implement these much needed changes.

The health of the Gulf is important to me because I swim at the beaches, I visit the islands, I sail, I do water sports (ski, surf, paddle board, kite boarding, windsurf).

Preservation of our sea bed in the Hauraki Gulf is the responsibility of all people in the greater Auckland area. We know have a Mayor with the determination and ability to lead a determined effort to protect

both our sea and fresh water assets.

The Department of Conservation will also get full support from Aucklanders in their excellent effort of preservation..

We have seen the direct benefit of marine protection at Goat Island / Te Hāwera-a-Maki, Whanganui-ā-Hei and the Poor Knights / Tawhiti Rahi. The proposal to protect a network of small areas in the Gulf will stimulate regeneration in these areas and beyond them.

The Government MUST act with urgency to set in place all 19 protection zones proposed. Expert opinion and successive State of the Gulf reports indicate that the Gulf is in a biodiversity crisis and close to ecological collapse. It is time to act for the benefit of future generations to improve the state of the Hauraki Gulf Marine Park.

Nāku noa, nā

s 9 (2)(a)

s 9 (2)(a)

IMPORTANT: Please remove my contact information (email address & phone number) prior to publishing this submission in the public domain.

Sea Change

From: s 9 (2)(a)s 9 (2)(a)
Sent: Thursday, 27 October 2022 8:37 am
To: Sea Change
Subject: Hauraki Gulf / Sea Change

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

I am absolutely opposed to bottom trawling as it is unnecessary and destructive.

s 9 (2)(a) Taranaki.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 9:00 am
To: Sea Change
Subject: Submission on 'Revitalising the Gulf'
Attachments: Submission Hauraki Gulf 27 Oct 2022.docx

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Good morning.

Please find attached my submission on the 'Revitalising the Gulf' proposals.

Yours

s 9 (2)(a)

Submission on 'Revitalising the Gulf'

Date of submission: 27 October 2022

Name: s 9 (2)(a)

Submission on behalf of: Private individual

Contact details:

Postal address

Tel.

Email

s 9 (2)(a)

HPAs

The marine environment of Auckland's Hauraki Gulf needs as much protection as possible. Therefore, I am in favour of the establishment of High Protection Areas and Seafloor Protection Areas, and the extension of marine reserve areas as set out in the document, *Revitalising the Gulf – Marine Protection Proposals*.

Bottom trawling and sand mining

However, I am shocked to discover that bottom trawling and sand mining, both of which are notoriously detrimental to marine life, are still allowed in **any** area of the Hauraki Gulf.

Submission 1:

I submit that all bottom-trawling activities should be made illegal in the entire area of the Hauraki Gulf, with immediate effect.

Submission 2:

I submit that all sand-mining activities should be made illegal in the entire area of the Hauraki Gulf, with immediate effect.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 9:06 am
To: Sea Change
Subject: Proposed changes to the marine reserve on the Hauraki Gulf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

I wish to add my voice to the proposed changes to the Hauraki Gulf. I would like to see a marine reserve extending much further than the proposed 18%, this is not enough. The Hauraki Gulf is a desert, it has been decimated by overfishing, particularly deep seabed dredging for scallops. Seabed dredging should be forbidden, it is barbaric and it is incredible that this is still permitted in a country like ours. There have been local initiatives in the Coromandel Peninsula to protect scallop beds which have been welcomed by New Zealanders, there is a real desire to do something about the future of our seabeds. This is one last chance to make a change, do it once and do it properly, we are the guardians of our future, we have to act like we are guardians and not just pillagers of the sea.
Yours faithfully

s 9 (2)(a)

Sea Change

From: s 9 (2)(a)s 9 (2)(a)
Sent: Thursday, 27 October 2022 9:18 am
To: Sea Change
Attachments: marine reserve submission 1.jpg

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Sent from [Mail](#) for Windows

s 9 (2)(a)

s 9 (2)(a)

I am a full time resident and a boat owner and keen fisherman. I agree with all the following points made by the Hahei Ratepayers at the AGM.

Please register my opposition to the proposal to extend the Marine reserve boundary to the main Hahei Beach.

Key direction following the AGM

Following robust discussion at the AGM the attendees came to the following consensus.

1. Hahei Beach Boundary

We do not agree that the marine reserve should be extended along Hahei Beach because:

1. It would be almost impossible to clearly identify the start/end of the Marine Reserve on a beach. This could lead to administration confusion relating to concessions, policing etc.
2. We believe dog owners should be able to walk their pets over the entire length of the beach when permitted by current TCDC regulations.
3. Hahei Residents believe they should retain the right to fish (or remove items such as shells or seaweed) along the entire beach

2. Mahurangi Island Boundary

A large majority would prefer that the north west coast of Mahurangi Island remain outside of any marine reserve expansion since it offers a safe family boating/fishing experience in adverse weather

3. Expansion of marine reserve seaward

All were in favour of this taking place.

4. Enforcement

There is no point in expanding the reserve unless **DOC provides better enforcement**, case in point the management of freedom camping in the beachfront carpark

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 9:40 am
To: Sea Change
Subject: Revitalising the Hauraki Gulf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

I support the Revitalising the Gulf initiative because it has been such a wonderful resource in so many ways over the years - for leisure, for food and so much more. I can't believe the state it is currently in

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 9:53 am
To: Sea Change
Subject: RE: Submission on Revitalising the Gulf Marine Protections proposal - s 9 (2)(a)

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Just to clarify, I don't actually support this proposal because I believe we need to do much more than protect just a few small areas of the Gulf.

Regards,

s 9 (2)(a)

s 9 (2)(a) | www.totalsport.co.nz

Here are some Great Events coming up in Stunning Locations!

Hunau Hillbilly - 5 November 2022 - www.hunuahillbilly.co.nz
The Taniwha - 12 November 2022 - www.thetaniwha.co.nz
Poronui Passage - 3 December 2022 - www.poronuipassage.co.nz
Speights West Coaster - 10 December 2022 - www.thewestcoaster.co.nz
Cargo Plus Coastal Challenge – 18 February 2023 - www.coastalchallenge.co.nz
Northpower Wild Kiwi – 11 March 2023 - www.thewildkiwi.co.nz
Partners Life Dual – 1 April 2023 - www.thedual.co.nz
T42 Central Plateau – 6 May 2023 - www.t42.co.nz
Eukanuba Tails and Trails - May 2023 - www.tailsntrails.co.nz
The Tora - May 2023 - www.thetora.co.nz
Cougar Trail Run - July 2023 - www.cougartrailrun.co.nz



From: Revive Our Gulf on behalf of s 9 (2)(a) <mailer.no-reply@reviveourgulf.org.nz>
Sent: Thursday, 27 October 2022 9:30 am
To: seachange@doc.govt.nz
Subject: Submission on Revitalising the Gulf Marine Protections proposal - s 9 (2)(a)

Kia ora DOC,

My name is s 9 (2)(a) . I reside in s 9 (2)(a)

I support the Revitalising the Gulf, Marine Protection Proposals package to establish new marine and seafloor protection areas in the Hauraki Gulf Marine Park / Tīkapa Moana / Te Moananui-ā-Toi (the Gulf). I encourage Ministers to proceed as quickly as possible to implement these much needed changes.

The health of the Gulf is important to me because I swim at the beaches, I visit the islands, I sail, I snorkel and/or SCUBA dive, I do water sports (ski, surf, paddle board, kite boarding, windsurf).

Surely protecting just a very small handful of areas and letting people (big industry) have at it with the rest is clearly not the way to go! We need to develop a plan for the WHOLE Hauraki Gulf Marine Park that removes destructive ways of fishing (such as bottom trawling - period) and implements sensible catch limits for all. I don't even eat/catch fish but it seems pretty clear that this Marine Park concept is not the way to improve the health of the Gulf as a whole.

We have seen the direct benefit of marine protection at Goat Island / Te Hāwera-a-Maki, Whanganui-ā-Hei and the Poor Knights / Tawhiti Rahi. The proposal to protect a network of small areas in the Gulf will stimulate regeneration in these areas and beyond them.

The Government MUST act with urgency to set in place all 19 protection zones proposed. Expert opinion and successive State of the Gulf reports indicate that the Gulf is in a biodiversity crisis and close to ecological collapse. It is time to act for the benefit of future generations to improve the state of the Hauraki Gulf Marine Park.

Nāku noa, nā

s 9 (2)(a)

s 9 (2)(a)

IMPORTANT: Please remove my contact information (email address & phone number) prior to publishing this submission in the public domain.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 10:01 am
To: Sea Change
Subject: Plan submission
Attachments: Hauraki Gulf Marine Spatial Plan Submission.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

s 9 (2)(a)

s 9 (2)(a)

27.20 2022

Re: Revitalise Hauraki Gulf Proposal

As a resident of Auckland I support the – Hauraki Gulf Marine Spatial Plan with the following amendments.

1. All trawling should be prohibited from the entire Hauraki Gulf Marine Park area.

Regards

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 10:17 am
To: Sea Change
Subject: Submission

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

To Whom it may concern

I have read the brief on what is proposed. As a diver and fisherman in the hauraki gulf I am concerned that the proposal does not extend far enough to bring the gulf back from the brink. The SPA's need to be extended through the whole of the inner gulf to allow the seabed to reestablish. The piecemeal approach will not have the impact needed.

Regards

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 12:50 pm
To: Sea Change
Subject: Hauraki Gulf Protection Proposal
Attachments: Seachange DOC proposal.docx

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

To whom it may concern.

Please see attached
Regards s 9 (2)(a)

Seachange
Department of Conservation
Seachange@doc.govt.nz

25 October 2022.

Submission on proposed High Protection Zones in the Hauraki gulf

My/our concerns about this process and the proposal itself can be summarised as follows:

It is not democratic

- Very little time has been given for people to hear about, understand and respond to these marine protection proposals .
- The source documents are complex and the most important information about the size and reach of the proposed High Protection Areas are located in the appendix (slides 124 to 142) of a 144 page report
- Not all relevant stakeholders or intermediaries between the proposal and the affected groups have been directly contacted by DOC or HGF to alert them to this proposal. For example bait and fishing supply shops had no idea of this proposal yet it is their customers who will be directly affected by the establishment of no fish zones around the inner gulf areas including 50 km² area around the Noises.

It is potentially very divisive.

The proposal expressly prevents any recreational or commercial fishing in these areas but allows for :

The customary practices of mana whenua, including customary non-commercial fishing, will be provided for within HPAs. Customary practices will be managed to achieve the biodiversity objectives agreed with mana whenua for each site. Protected Customary Rights (PCR) and Customary Marine Title (CMT) recognised under the Takutai Moana Act will be unaffected.

Inevitably this will be reinterpreted as two different sets of rules for the same area of water that was once accessible to all. There is no guidance within the documentation on how this work in practice in large areas such as the Noises (50 km²) or the Motukawao Group (30 km²) which is a very popular and productive fishing area across all cultural groups, Maori, Pakeha, Pacifica and Asian

It inconsistently applies its own guidelines to justify the HPA's .

The purpose of the High Protection Ares is to *support the recovery of some of the most biodiverse regions in the Gulf.*

Some of the most at risk marine ecosystems include scallops, crayfish and the loss of kelp forests, in part, to a greater or lesser extent, due to the encroachment of kina.

Yet few of the detailed assessments outlining the ecological objectives and justification for an HPA specifically mention the protection or restoration of scallops or crayfish and in some cases the report acknowledges that *most of the soft-sediment habitat within the area has unknown values; it is thought to be dominated by mud substrate (Motukawao group).*

Nor is there any data or observations that set the benchmark on how the establishment of the specific HPA's will improve the pre-HPA ecosystems around these areas.

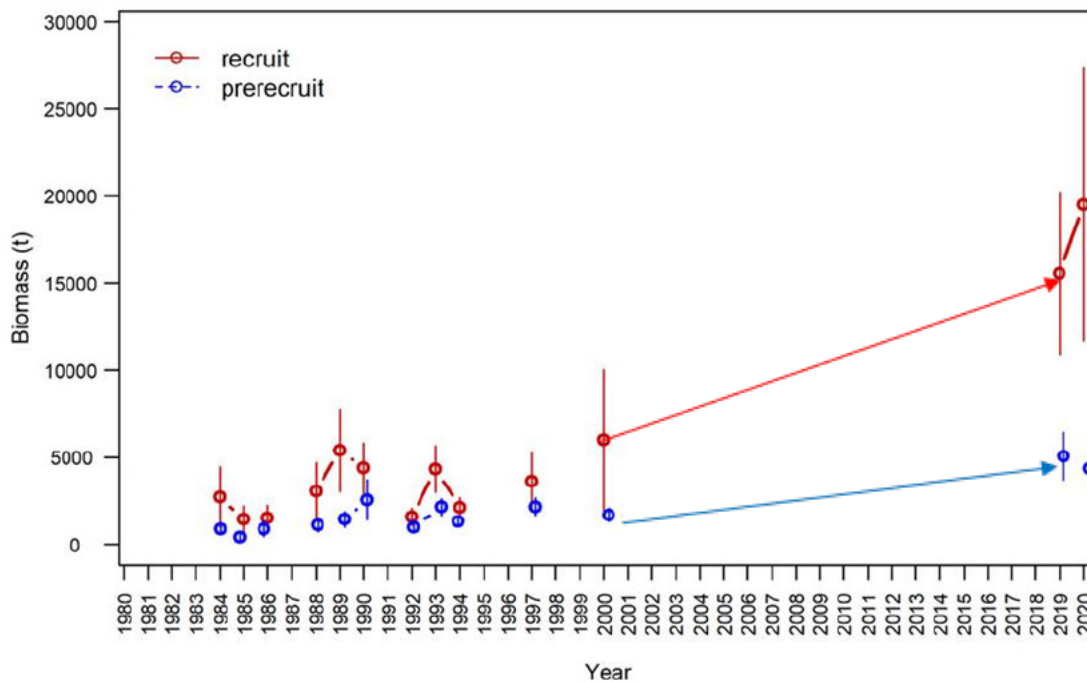
Part of the fundamental rationale for the establishment of these HPA's are out of date or no longer apply .

Much of the work on the establishment of these HPA's began 6- 7 years ago; well before the Gulf wide government moratorium on scallop collection or dredging, or collection of crayfish or the establishment of rahui to protect coastlines. But the rationale for these HPA's do not reflect these important advancements in the protection of sea-life and the sea floor.

The narrative of the DOC proposal and its supporting documentation also predates the publication of the NIWA trawl survey data in 2021 that shows snapper stocks and many other species have significantly recovered over recent years .

See slide below :

Fishery independent trawl surveys



HPA's are not strategically aligned to solving the biggest future threat to the Gulf .

With the reduction of commercial fishing pressure, decreases in recreational bag quota and the moratoriums on crayfish and scallop harvesting the pressure on the future of the Hauraki Gulf increasingly shifts towards land based, not sea-based activities.

The biggest threat to the recovery of the Gulf is sedimentation; from rural and forestry-based activities in the Waikato and Coromandel catchments and the rapid development of rural land for housing and commercial developments along the northern and southern coastlines of the Auckland region.

The increasing rate of subdivision, combined with higher frequency high volume rainstorms has accelerated the flow of sediments down the many streams and rivers to the estuaries that feed into our coastlines from Long bay north to Leigh, and on Waiheke Is land . And the extension of the northern motorway is only going to push that rate of sedimentation along the very coastline that feed into the HPAs for Tiritiri Matangi, Mahurangi, Kawau Is land right up to Goat Is land itself.

If we need to see what the future of suffocating sedimentation looks like, visit Long Bay reserve after a storm, or compare the health of the Waitemata harbour to what it was 6 years ago.

The danger is that the establishment of HPA's creates an illusion of protection and revitalisation when sedimentation will continue to spread across the Gulf irrespective of these new boundaries.

In summary the proposed creation of these HPA's is:

- based on out of date data and assumptions about the biggest threats to the Gulf,
- the process for gathering feedback is undemocratic
- the establishment of the HPA's is potentially very divisive between manu whenua Māori and other long established groups of gulf users.
- Will not solve the fundamental problems facing the health of the Hauraki Gulf, which are now fundamentally land based.
- The snapper stocks have recovered but I am finding fish that are in poor health due to starving with silting inhibiting fish to feed properly. I have fished the gulf for 35 plus years and this problem has increased remarkably over the last 10 years.

Thank you, for your consideration.

Regards

s 9 (2)(a)

Commercial Skipper

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a) >
Sent: Thursday, 27 October 2022 11:13 am
To: Sea Change
Subject: Submission on Hauraki Gulf Marine Park Marine Protection Proposals
Attachments: HGMP_Submission.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

To whom it may concern,

Please find my submission attached.

s 9 (2)(a)

Hauraki Gulf Marine Park Marine Protection Proposals - Submission

I reject the government proposals in favour of 100% seabed protection and more meaningful public consultation.

- I do not support the Government-proposed Marine Protection proposal for the Hauraki Gulf Marine Park because it doesn't go far enough.
- I support an integrated approach to managing both conservation and fisheries management in the Hauraki Gulf Marine Park, acknowledging marine protection needs to align with fisheries management
- I want bottom trawling, mining, dumping, scallop dredging, and Danish seining banned from the Marine Park.
- I support 100% seabed protection for the entire Hauraki Gulf Marine Park.
- I object to the lack of information and detail around the proposal and implementation plan.
- I'm in favour of 100% seabed protection, meaning low-impact activities such as commercial fishing, potting and small-scale long lining, Māori customary and recreational fishing can continue.
- I support extending the consultation deadline for marine protection to align with the Hauraki Gulf Fisheries Plan process which ends in February 2023.

s 9 (2)(a)

s 9 (2)(a)

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 11:51 am
To: Sea Change
Subject: Proposal Response - Sand Mining and Bottom Trawling - Hauraki Gulf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Please accept this email as my opposition to any further sand mining and bottom trawling in the Hauraki Gulf.

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 12:07 pm
To: Sea Change
Subject: Hauraki Gulf proposals.

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

To whomever it may concern,

My name is s 9 (2)(a) and I am a teacher at s 9 (2)(a) (Not representative of the organisation).

I find it deeply disturbing that sand mining and deep sea trawling are both included in the proposals for revitalizing the gulf. These need to be removed entirely for the benefit of our oceans and society.

Including these practices is completely contradictory to the purpose of the proposal and will undo any revitalization in other areas. While this may cause disturbances to certain economic groups, the benefit will be felt by generations of Aucklanders and tourists.

The idea of protecting "certain areas" rather than others is a human construct which, believe it or not, animals do not adhere to. Many fish and species of sea life are migratory creatures that rely on the health of this Taonga.

Recently the ability for the Mediterranean sea has lost a very important benefit. It no longer acts as a carbon sink as it traditionally has.

This is due to the same overheating and overfishing that New Zealand waters are currently undergoing. While the timelines are obviously different, the scenario acts as a poignant reminder.

From a Maori perspective, these two actions would significantly undermine the promises made in The Treaty of Waitangi, specifically for Iwi in Northland and Tamaki Makarau. The ocean is a Taonga and these actions would leave future generations without the abundance of life and Kai Moana that our generation has enjoyed.

The entire Hauraki Gulf needs a legalized Rahui on all seafloor practices. The water table and all of the life included are reliant on this bottom level, as is the temperature of our ocean.

Warm regards,

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 12:12 pm
To: Sea Change
Subject: Submission on marine protection proposals for the Hauraki Gulf
Attachments: Seachange DOC proposal.docx

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Please find my submission for the on marine protection proposals for the Hauraki Gulf mainly the Noises restriction on recreational fishing.

Please feel free to contact me if you have any questions

Regards

s 9 (2)(a)

s 9 (2)(a)

Seachange
Department of Conservation
Seachange@doc.govt.nz

25 October 2022.

Submission on proposed High Protection Zones in the Hauraki gulf

My/our concerns about this process and the proposal itself can be summarised as follows:

It is not democratic

- Very little time has been given for people to hear about, understand and respond to these marine protection proposals .
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- Not all relevant stakeholders or intermediaries between the proposal and the affected groups have been directly contacted by DOC or HGF to alert them to this proposal. For example bait and fishing supply shops had no idea of this proposal yet it is their customers who will be directly affected by the establishment of no fish zones around the inner gulf areas including 50 km² area around the Noises.

It is potentially very divisive.

The proposal expressly prevents any recreational or commercial fishing in these areas but allows for :

The customary practices of mana whenua, including customary non-commercial fishing, will be provided for within HPAs. Customary practices will be managed to achieve the biodiversity objectives agreed with mana whenua for each site. Protected Customary Rights (PCR) and Customary Marine Title (CMT) recognised under the Takutai Moana Act will be unaffected.

Inevitably this will be reinterpreted as two different sets of rules for the same area of water that was once accessible to all. There is no guidance within the documentation on how this work in practice in large areas such as the Noises (50 km²) or the Motukawao Group (30 km²) which is a very popular and productive fishing area across all cultural groups, Maori, Pakeha, Pacifica and Asian

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Some of the most at risk marine ecosystems include scallops, crayfish and the loss of kelp forests, in part, to a greater or lesser extent, due to the encroachment of kina.

Yet few of the detailed assessments outlining the ecological objectives and justification for an HPA specifically mention the protection or restoration of scallops or crayfish and in some cases the report acknowledges that *most of the soft-sediment habitat within the area has unknown values; it is thought to be dominated by mud substrate (Motukawao group).*

Nor is there any data or observations that set the benchmark on how the establishment of the specific HPA's will improve the pre-HPA ecosystems around these areas.

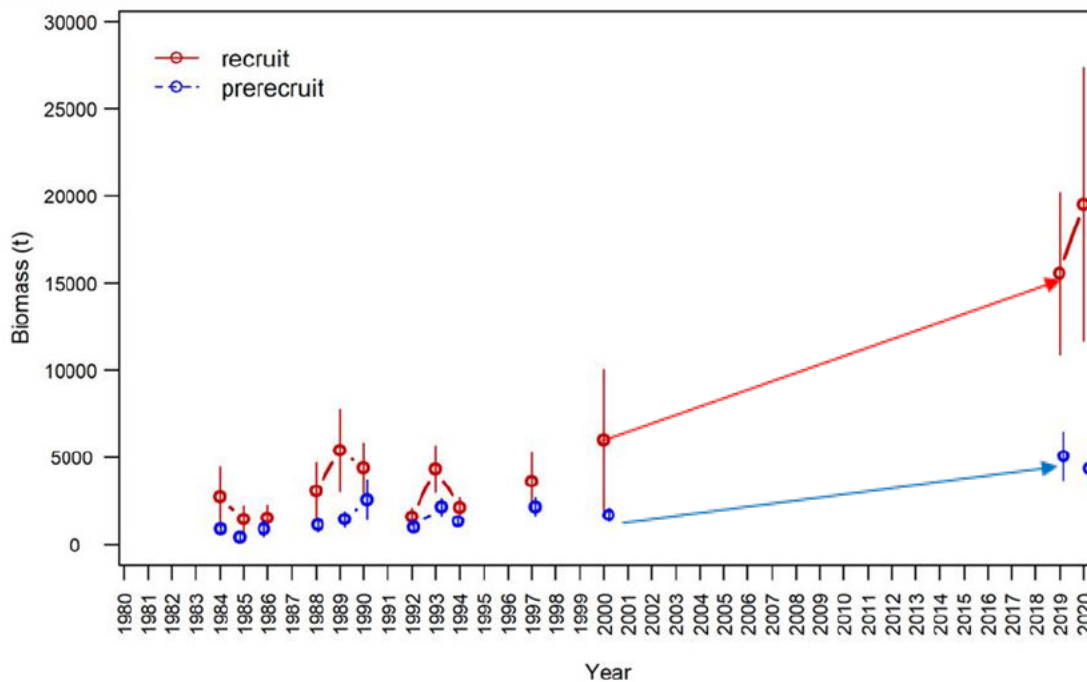
Part of the fundamental rationale for the establishment of these HPA's are out of date or no longer apply .

Much of the work on the establishment of these HPA's began 6- 7 years ago; well before the Gulf wide government moratorium on scallop collection or dredging, or collection of crayfish or the establishment of rahui to protect coastlines. But the rationale for these HPA's do not reflect these important advancements in the protection of sea-life and the sea floor.

The narrative of the DOC proposal and its supporting documentation also predates the publication of the NIWA trawl survey data in 2021 that shows snapper stocks and many other species have significantly recovered over recent years .

See slide below :

Fishery independent trawl surveys



HPA's are not strategically aligned to solving the biggest future threat to the Gulf .

With the reduction of commercial fishing pressure, decreases in recreational bag quota and the moratoriums on crayfish and scallop harvesting the pressure on the future of the Hauraki Gulf increasingly shifts towards land based, not sea-based activities.

The biggest threat to the recovery of the Gulf is sedimentation; from rural and forestry-based activities in the Waikato and Coromandel catchments and the rapid development of rural land for housing and commercial developments along the northern and southern coastlines of the Auckland region.

The increasing rate of subdivision, combined with higher frequency high volume rainstorms has accelerated the flow of sediments down the many streams and rivers to the estuaries that feed into our coastlines from Long bay north to Leigh, and on Waiheke Is land . And the extension of the northern motorway is only going to push that rate of sedimentation along the very coastline that feed into the HPAs for Tiritiri Matangi, Mahurangi, Kawau Is land right up to Goat Is land itself.

If we need to see what the future of suffocating sedimentation looks like, visit Long Bay reserve after a storm, or compare the health of the Waitemata harbour to what it was 6 years ago.

The danger is that the establishment of HPA's creates an illusion of protection and revitalisation when sedimentation will continue to spread across the Gulf irrespective of these new boundaries.

In summary the proposed creation of these HPA's is:

- based on out of date data and assumptions about the biggest threats to the Gulf,
- the process for gathering feedback is undemocratic
- the establishment of the HPA's is potentially very divisive between manu whenua Māori and other long established groups of gulf users.
- Will not solve the fundamental problems facing the health of the Hauraki Gulf, which are now fundamentally land based.

Thank you, for your consideration.

Regards

s 9 (2)(a)

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 12:19 pm
To: Sea Change
Subject: Support for Sea Change proposal

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Kia ora,

I wholeheartedly support this initiative.

The proposals to create 12 high protection areas and 5 seabed protection areas and the 2 extended protection marine reserve areas of Goat island / Okakari Point and Cathedral Cove / Whanganui-a-hei is necessary to save the Hauraki gulf and beyond from becoming a marine desert!

I am a teacher , who has taught Sea sports which utilises the gulf for sailing, snorkeling, scuba diving, sustainable fishing (catch- measure-record-release) in the curriculum.

I volunteer for Coastguard and am in a position to educate boaties about safe recreational use and environmental protection of the gulf.

Also living on s 9 (2)(a) for over 40 years I have witnessed the decline in the marine life around the island. This proposal has my support. I beg you to embrace it. This is the best collaboration I've seen. Use it!

s 9 (2)(a)
s 9 (2)(a)

Sent from my iPhone

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Information contained in this email is confidential unless otherwise stated. If you are not the intended recipient, please destroy all copies of this email including any attachments and notify the sender immediately.

Views expressed in this email are not necessarily those of s 9 (2)(a) . Any unauthorised copying, disclosure or distribution of the material in this email is strictly forbidden

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 12:22 pm
To: Sea Change
Subject: Revitalise The Gulf.

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

To Whom It May Concern,

My name is s 9 (2)(a) and I've been recreational fishing in the Hauraki Gulf my whole life.

I'm concerned that the research you have on recreational fishing displacement due to your HPA is extremely limited.

I note that the document only considers recreational displacement in terms of snapper, when there are numerous other species with high value for recreational anglers. Kingfish, for example, tend to congregate around reef structures, such as those found around many of your proposed HPA zones (e.g., Mokohinaus, Ōtata/the Noises, Aldermans etc.). Therefore, kingfish fishing spots are actually much more limited than snapper fishing spots in the Hauraki Gulf. The displacement will simply increase fishing pressure on the remaining kingfish reefs.

I also note that Ōtata/the Noises was "not considered in [the] analysis." This location is an extremely popular recreational fishing area for a wide range of species.

I believe blanket 'not-take' areas are not the best solution. It seems that once they have been established there is no going back, even if research suggests recreational fishing should be allowed to some extent as environments and stocks improve.

You can look overseas for many examples of better measures to control recreational fishing - such as closed seasons, slot size limits, and/or permits.

Kind regards

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 12:30 pm
To: Sea Change
Subject: Marine Reserves

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

My name is s 9 (2)(a) and I think that it would be better if you did the other things you were proposing apart from the Mokahinaus and Kawau.

--

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 12:57 pm
To: Sea Change
Subject: Submission Revitalising the Gulf marine protection proposals
Attachments: Revitalising the Gulf submission SShort 27.10.22.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

To whom it may concern at the Department of Conservation.

Please find attached a copy of my submission on Revitalising the Gulf marine protection proposals.
Please acknowledge receipt of this submission.

Thank you,

s 9 (2)(a)

Email: s 9 (2)(a)

s 9 (2)(a)

Cellphone: s 9 (2)(a)

Submission on Revitalising the Gulf marine protection proposals

Thank you for the opportunity to comment on the Revitalising the Gulf Marine protection proposals. Please accept the following as my submission.

I support moves to enhance the health of the Hauraki Gulf. The 'Revitalising the Gulf' plan represents a step in the right direction, but it doesn't go far enough.

High Protection Areas

I am dismayed to find that the proposals do not include a single new 'no-take' area - scientifically proven as the most effective type of marine protection.

The proposed 'High Protection Areas,' which will allow customary take rights - exclusive to iwi and at their discretion - make the stated objective of marine protection secondary to iwi fishing concessions.

In effect the High Protection Areas will allow exclusive-to-iwi fishing reserves. This flies in the face of the collective responsibility we all have - i.e. to protect the Gulf. This is also contrary to the Treaty of Waitangi, which promises "ngā tikanga katoa rite tahi" - equal rights for all.

No-take marine reserves under the Marine Reserves Act are a more effective way to restore the health and biodiversity of the Gulf. **Therefore, I recommend the 'High Protection Areas' be replaced with a higher level of marine protection such as a marine reserve classification.**

Extensions to Whanganui-a-Hei (Cathedral Cove) and Cape Rodney – Okakari Point marine reserves.

I recommend that the two proposed protected areas adjacent to these reserves be no-take marine reserve extensions – not High Protection Areas.

Seafloor Protection Areas

The proposal for new 'Seafloor Protection Areas' is welcome. However, this proposal doesn't go far enough. I recommend that bottom trawling, scallop dredging and Danish seining – in fact any destructive fishing methods – be banned from the entire Hauraki Gulf Marine Park. Restricting these practices to 'trawling corridors' does not ameliorate the destruction - it is still environmental vandalism.

In summary, I urge the following:

"Let us put self-interest aside and unite in our commitment to do the best we can for the health and well-being of the Hauraki Gulf."

Thank you.

s 9 (2)(a)

27 October 2022

Sea Change

From: Glass Bottom Boat s 9 (2)(a)
Sent: Thursday, 27 October 2022 1:05 pm
To: Sea Change
Subject: Marine protection submission
Attachments: Submission - Marine reserve Extension - 27 October 2022.docx

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Good afternoon,

Please find attached our submission for the marine protection proposal.

Please feel free to contact me on s 9 (2)(a) to discuss our submission.

Thanks,

s 9 (2)(a)

Glass Bottom Boat

s 9 (2)(a)

www.glassbottomboatwhitianga.co.nz

Submission: Proposed protection zones designed to revitalise the Hauraki Gulf and its marine life.

Date: 27 October 2022

Name: s 9 (2)(a)

Company:

Glass Bottom Boat Whitianga

s 9 (2)(a)

The Glass Bottom Boat is an eco-tour company based out of Whitianga. We spend the majority of our tour viewing the marine life inside the marine reserve. Our tours are very environmentally focused and team members discuss the importance of the marine reserve, the need for sustainability and how our guests can become the Kaitiaki of the ocean. We often view inside the reserve to show our guest what a healthy ecosystem can look like, then them outside and show them how unhealthy a non-protected area can end up. We discuss matters such as over fishing, disturbing the marine life and the kina barren issue.

This is our response in regards to the marine protection proposals:

12 High Protection Areas (HPAs):

We agree with the purpose of High Protection Areas: “To protect, enhance and restore the full range of marine communities and ecosystems and outstanding, rare, distinctive or nationally important marine habitats to protect the mauri of the Gulf.” is in line with the thinking, philosophy of our company and crew. We believe people will love and protect what they can see. By getting to show our guests a healthy ocean full of marine life they will understand the importance of protecting it and become an advocate for this. The more HPA areas there are the better chance we have a healthy marine eco system.

5 Seafloor Protection Areas:

These areas will protect sensitive sea floor habitats. They will do this by prohibiting activities that damage or disturb the seafloor, like bottom trawling and mining. But they will still allow for activities that do not conflict with seafloor protection objectives. Such as fishing that does not use bottom-contact methods, snorkelling, and kayaking. We agree that activities such as bottom trawling and mining should not be allowed in protected areas.

2 protected areas: These will be adjacent to Cathedral Cove | Whanganui-a-Hei and Cape Rodney-Okakari Point marine reserves. These will be established as either two new High Protection Areas, or as extensions to the two existing marine reserves.

Expansion of Te Whanganui-A-Hei Marine

We are in full support for the extension of the Te Whanganui A Hei Marine Reserve. This would enhance the reserve by reducing the pressure of fishing at the edges, enabling effective protection of the reef ecosystem. As we are on the water most days we see fishing happening on the boundary line of the reserve most days. This is done by both recreational fishing boats and commercial. We believe this is unacceptable practice!

The pros of having a glass bottom means we can see where the healthy eco systems start and finish. In regards to Mahurangi Island, its very easy to tell where the marine reserve boundary line stops. We can see the lack of predatory fish and cray fish in the area along the island and can see the damage that the kina are doing to the kelp and weed areas. Moving the boundary line to include entire Western side of the island and also the southern end would be highly beneficial to the marine life in the area. It would be great to see the health of the area return along with the kelp.

This area is also where most fur seals are seen while on the tour, indicting it's a popular spot for them to rest and fish. With the recent struggle the seal pups have been facing the past few years, these rookery areas should certainly be protected.

Even though we agree with the expansion of the reserve we have some concerns and considerations:

- We agree with the seaward expansion.
- We agree with the southward extension adjustment to align with the western coastline of Mahurangi Island and to avoid impacting on the recreational values associated with the eastern side of the island. However would like to see the southern end of the island included
- We do not agree with the proposal of the boundary line to come halfway along Hahei Beach. This will impact use of the beach for beach fishing and sea shell collection, dog walking or other beach activities. The township of Hahei is very dependent on these. The proposed boundary line half way along the beach will also be very hard to enforce, unless someone is stationed there every day.

Our company and our team are very environmentally focused and have a passion for our the Te Whanganui A Hei Marine Reserve and the conservation of the area. We feel It's a very special area that deserves respect and protection. The expansion of the marine reserve Will be highly beneficial to the area and warmly welcomed.

Sea Change

From: s 9 (2)(a)
Sent: Thursday, 27 October 2022 1:36 pm
To: Sea Change
Subject: HGMP submission
Attachments: HGMP_Submission.docx

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded



s 9 (2)(a) | Operations manager

s 9 (2)(a)

www.cameronoutdoors.co.nz

Postal Address: s 9 (2)(a)

Warehouse: s 9 (2)(a)

Hauraki Gulf Marine Park Marine Protection Proposals - Submission

I reject the government proposals in favour of 100% seabed protection and more meaningful public consultation.

- I do not support the Government-proposed Marine Protection proposal for the Hauraki Gulf Marine Park because it doesn't go far enough.
- I support an integrated approach to managing both conservation and fisheries management in the Hauraki Gulf Marine Park, acknowledging marine protection needs to align with fisheries management
- I want bottom trawling, mining, dumping, scallop dredging, and Danish seining banned from the Marine Park.
- I support 100% seabed protection for the entire Hauraki Gulf Marine Park.
- I object to the lack of information and detail around the proposal and implementation plan.
- I'm in favour of 100% seabed protection, meaning low-impact activities such as commercial fishing, potting and small-scale long lining, Māori customary and recreational fishing can continue.
- I support extending the consultation deadline for marine protection to align with the Hauraki Gulf Fisheries Plan process which ends in February 2023.
- I disapprove of the racist access proposed for customary gathering in restricted areas.

s 9 (2)(a)

s 9 (2)(a)

Sea Change

From: Hauturu Supporters s 9 (2)(a)
Sent: Thursday, 27 October 2022 1:36 pm
To: Sea Change
Subject: Marine protection proposals re Hauturu-o-Toi
Attachments: Submission on marine protection proposals relating to Hauturu-o-Toi.docx

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Greetings -

As chair of the Hauturu Supporters Trust, I attach our submission on the marine protection proposals relating to Hauturu-o-Toi.

Best wishes.

s 9 (2)(a)
Chair

Consultation on Marine Protection Measures for the Hauraki Gulf
Department of Conservation
seachange@doc.govt.nz

Submission on Marine Protection Measures for the Hauraki Gulf

The Hauturu Supporters Trust is a charitable trust with a long history of working to protect the unique environment of Hauturu-o-Toi or Little Barrier Island.

Hauturu-o-Toi is one of the most highly prized and protected areas of the natural environment in New Zealand. Ironically this protection stops at the shoreline. Below the waterline, it is open slather for all kinds of fishing activities. This has resulted in massive adverse impacts on this unique and important natural environment.

“The last 50 years or more of heavy fishing pressure around the island has had a devastating effect on the health of its reefs, leaving a desolate wasteland of urchin or kina barrens, depleted fish and other kaimoana stocks, and the loss of previously productive kelp forests (*Ecklonia radiata*). What we now have is a mere shadow of the rich and diverse marine ecology of yesteryear” (Grace, 2019).

More recent research confirms that unrelenting fishing pressure is continuing to damage the underwater ecosystems surrounding Hauturu-o-Toi (Dartnall, 2022). This research has found that kina barrens did not occur on the reefs around Hauturu-o-Toi in the 1950s. By the 1970s, however, they were a major habitat on subtidal reefs, covering 11.6% of reef at Hauturu-o-Toi. By 2022 this has almost tripled to 32%. “This progression is consistent with industrial scale removal of predators, such as the spiny rock lobster and snapper, from the middle of last century” (Dartnall, 2022).

In addition to the widespread destruction of the underwater environment of this precious motu, vessel activity in the vicinity of Hauturu-o-Toi, especially commercial fishing vessels, greatly increases the risk of incursion from pest species on the island, especially rodents. Such an incursion would be of major significance to the extremely high conservation values of Hauturu-o-Toi. To achieve pest elimination, an very expensive response would be needed.

We support the proposed marine protection measures for Hauturu-o-Toi. We believe that they need to be more extensive to provide greater and more comprehensive protection to a highly valuable marine environment that is integral to sustaining the ecological integrity of the associated nature reserve at Hauturu-o-Toi.

Thank you for consideration of our concerns on this matter.

s 9 (2)(a)

Chairperson

References:

Grace, R. 2019. Seas around Hauturu. In: Hauturu: The history, flora and fauna of Te Hauturu-o-Toi Little Barrier Island. Eds. Wade, L. & Veitch, D. Massey University Press, pp.250-265.

Dartnall, L. 2022. The extent of kina barrens over time at Hauturu-o-Toi and the Noises Islands. MSc Thesis, in Marine Science. University of Auckland. 69pp.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 1:41 pm
To: Sea Change
Subject: Submission
Attachments: 2022 Hauraki Gulf.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Proposed protection zones designed to revitalise the Hauraki Gulf and its marine life

This submission is in support of the proposed protection zones in the Hauraki Gulf. This is an individual submission representing my personal views.

I live in Auckland and use the Waitemata Harbour for swimming and sail boarding. I also have a camping site in Matheson Bay in Leigh where I can connect with the Hauraki Gulf. One of my best memories is watching a family of Orca come in close to the beach on the north side of Motuihi Island. As a doctor, my main professional interest is in human health. It is clear that human health is dependent on the health of the environment (for further information see the Planetary Health Alliance¹. People benefit from connection with nature.² It is also clear that an integrated complex systems approach is needed whereby the health of the ocean, wetlands, biodiversity, as well as climate change, all impact of the health of New Zealanders.

The state of the Hauraki Gulf has been recently described in at least two excellent articles in the New Zealand Geographic: How to Fix the Hauraki Gulf, May-Jun 2020³ and A Tragedy of The Commons, Jan-Feb 2022,⁴ and extensively reviewed in the Auckland Council report, State of our Gulf 2020⁵

I support the Revitalising the Gulf, Marine Protection Proposals package to establish new marine and seafloor protection areas to restore the Hauraki Gulf Marine Park / Tikapa Moana / Te Moananui ā Toi.

Marine protection is the only proven way to restore an ecosystem to full health. An intact ecosystem is also more resilient to external pressures such as sedimentation, pollution and the impacts of climate change.

We have seen the direct benefit of marine protection at Goat Island and the Poor Knights. The proposal to protect a range of small areas in the Gulf will bring the same benefits to the wider marine environment, feeding and replenishing unprotected waters.

s 9 (2)(a)

Auckland, Aotearoa New Zealand

Email **s 9 (2)(a)**

Phone **s 9 (2)(a)**

- 1 <https://www.planetaryhealthalliance.org/planetary-health> Planetary health is a solutions-oriented, transdisciplinary field and social movement focused on analyzing and addressing the impacts of human disruptions to Earth's natural systems on human health and all life on Earth.
- 2 Pritchard, A., Richardson, M., Sheffield, D., & McEwan, K. (2020). The Relationship Between Nature Connectedness and Eudaimonic Well-Being: A Meta-analysis. *Journal of Happiness Studies*, 21(3), 1145–1167.
- 3 <https://www.nzgeo.com/stories/how-to-fix-the-hauraki-gulf/> The once abundant Hauraki Gulf is on the brink of collapse, and while science is clear on how to repair it, many are putting rights before responsibilities. Here's what needs to happen.
- 4 <https://www.nzgeo.com/stories/a-tragedy-of-the-commons/> Land is owned, but the sea is shared. And we haven't been sharing very well.
- 5 <https://www.aucklandcouncil.govt.nz/about-auckland-council/how-auckland-council-works/harbour-forums/docsstateofgulf/state-gulf-full-report.pdf> The Hauraki Gulf / Tikapa Moana / Te Moananui-ā-Toi is special. It's special because of the beauty and variety of its land and seascapes. Sandy beaches, towering bluffs, islands large and small, clear open water, reefs, sheltered harbours, tidal estuaries, and a host of other natural habitats. It's special because the abundance and diversity of life those places support. It's special because it enriches our lives.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 1:42 pm
To: Sea Change
Subject: Revitalising the Gulf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

To whom it may concern,

I **do not** support the proposed new marine protection zones in the Hauraki Gulf as they don't appear to be genuine efforts towards conservation.

If the objective is revitalisation of the gulf, then there should be broader changes to limits and fishing methods allowed. E.g. lower limits on specific daily takes, a ban on taking crayfish, bottom trawling, scallop dredging etc. Any proposed changes should be transparent and supported by proper scientific studies.

The establishment of the "High Protection Areas" (HPAs) doesn't seem likely to achieve much, aside from annoying a lot of recreational anglers. The HPAs would completely exclude some popular, safe, accessible areas for a lot of Auckland fishers (areas 11a, 10a and 5 in particular). However, there would still be significant pressure on the fisheries in those areas from customary practices of mana whenua.

Full marine reserves could have some merit and provide some attractive areas for recreational snorkelling & diving but the areas outlined appear excessive for this purpose. I would support some extension of the Leigh marine reserve but again the area outlined seems excessive.

Yours sincerely,

s 9 (2)(a)

s 9 (2)(a)

Sea Change

From: s 9 (2)(a)
Sent: Thursday, 27 October 2022 1:44 pm
To: Sea Change
Subject: SUBMISSION RE GULF PROTECTION PLAN - s 9 (2)(a)
Attachments: Submission to Dept Of Conservation re Gulf Protection Plan 27 October 2022.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

My submission is attached.

Please acknowledge receipt

s 9 (2)(a)

s 9 (2)(a)

I reject the government proposals in favour of 100% seabed protection for the whole Hauraki Gulf Marine Park - and more meaningful public consultation.

- I want bottom trawling, mining, dumping, scallop dredging, and Danish seining banned from the Marine Park.
- I support 100% seabed protection for the entire Hauraki Gulf Marine Park.
- I object to the lack of information and detail around the proposal and implementation plan.
- I'm in favour of 100% seabed protection, meaning low-impact activities such as, small-scale long lining, Māori customary and recreational fishing can continue.
- I am not in favour of exclusive Maori customary rights prevailing over all other fishers.
- I support extending the consultation deadline beyond 28 October – although being uncertain of any extension, make this submission now.

Please outline how this proposal will affect the way you experience the Hauraki Gulf Marine Park.

I was previously a licensed commercial long-liner – 1970-1984 and then a Recreational Charter fishing Skipper 1991-2004. Since retirement, I am now a regular recreational fisher spending at least an average of one day fishing per week. My area of activity is the inner Gulf around Tiri Tiri and up to Kawau.

Have carefully studied the map of the proposed HPA for Tiri noting that the only permitted fishing activity will be for Maori. Whilst the area is small – I cannot accept there is justification for excluding Pakeha from this area. It will inevitably lead to confrontational situations.

It is rumoured that this HPA area is to be extended to encompass what the Map shows as a SPA, effectively locking Pakeha out from the area Shearer's Rock to Army Bay.

If there is any substance in that rumour – I suspect that “all hell will break out” as this is an area well used by many boaties and provides good shelter in many weather conditions.

A recent News Hub item informs us that three ex Police inflatables will be crewed by Maori to check on fish extraction. This has the potential to create significant racially divisive responses.

My catch experience does not support the belief that the fish stocks within the Gulf are in dire straits. Earlier removal of inner Gulf trawling and Danish Seining has seen a resurgence of stocks to levels experienced years ago. If totally removed from the entire Gulf, the results will be even better.

s 9 (2)(a) s 9 (2)(a) 27 October 2022

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 2:18 pm
To: Sea Change
Subject: Hauraki gulf revitalisation plan

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

s 9 (2)(a)

I am only representing myself but I do not agree with some of the proposals entered in the plan, it is a start but the public that fishes those areas recreationally need to be included in those plans as they have a huge understanding of the biodiversity.

Contact details

s 9 (2)(a)

s 9 (2)(a)

Sea Change

From: Coastal Custodians s 9 (2)(a)
Sent: Thursday, 27 October 2022 2:38 pm
To: Sea Change
Subject: Revitalise The Gulf Submission
Attachments: Coastal Custodians SeaChange Submission 27 Oct 22.pdf; Coastal Custodians Submission 17 March 22.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Dear Minister for Oceans and Fisheries, and Minister of Conservation,

Please find attached our submission on the Sea Change Plan, as well as a supporting document (our submission on the FOHG marine reserve proposal).

Yours Faithfully,

Coastal Custodians Leadership Group:

s 9 (2)(a)

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Coastal Custodians
<https://coastalcustodians.org/>

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 2:50 pm
To: Sea Change
Subject: submission on Revitalising the Hauraki Gulf Marine Protected areas.
Attachments: TOSSI-RTG-Submission-05FINAL.pdf

Good afternoon

On behalf of the Tāwharanui Open Sanctuary Society Inc, I attach a submission in support of extending the marine protected areas around the Tāwharanui Peninsula east of Warkworth.

There are a myriad of reasons why this is not just a good idea but critical to the continuing success of the sanctuary, and the revitalisation of the wider Gulf.

We look forward to positive consideration of this submission.

Kind regards

s 9 (2)(a)

Secretary

Tāwharanui Open Sanctuary Society Inc

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 3:13 pm
To: Sea Change
Subject: submission on extension of Whanganui-A-Hei marine reserve
Attachments: Submission on the Extension of the Whanganui 2022.docx

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Please find attached my submission concerning the changes to the Whanganui-A-Hei (Cathedral Cove) marine Reserve.

s 9 (2)(a) Ph.D., FAACB, J.P.(rtd).
s 9 (2)(a)
s 9 (2)(a)

Sent from [Mail](#) for Windows

Submission on the Extension of the Whanganui-A-Hei(Cathedral Cove) Marine Reserve

As a recreational fisherman and **s 9 (2)(a)** ratepayer I have been fishing off Hahei Beach for the last 60 years. Initially using a 2.4 meter dingy and rowing out from the beach and more recently a 3.4 meter dingy. As a result, I am well experienced with the sea conditions experienced in small boats off the beach and around the surrounding islands.

The proposed extension of the southern border all but **removes all access to protected water** from Hahei beach. This means that I and other users **would be prevented** from an activity that I have enjoyed with my children and grandchildren for many years. The new boundaries make it impossible for children and often inexperienced holiday makers to learn small boat skills and catch fish in a semi protected area

Despite the protection of the adjacent reserve over many years (30) in my experience there has been little significant change in the number, or species of fish caught. Access to this protected water area has historically, always been available for visitors and residents.

If, as I suspect, the reserve will extend from MHWS then several current activities (including collection of shells, interesting pebbles, and the occasional fossil as well as dog activities) that occur on this section of sandy beach will be prohibited. This **is not in the best interests of the people of New Zealand**

I therefore strongly object to any extension of the southern border of the Marine reserve along Hahei beach and Mahurangi Island.

s 9 (2)(a) Ph.D., FAACB, J.P(rtd).

Individual submission

s 9 (2)(a)

s 9 (2)(a)

s 9 (2)(a)

s 9 (2)(a)

s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 3:26 pm
To: s 9 (2)(a)
Cc: Sea Change
Subject: Re: Submission on Revitalising the Gulf Marine Protections proposal - s 9 (2)(a)

Received, thank you.

On Thu, Oct 27, 2022 at 10:54 AM Revive Our Gulf on behalf of s 9 (2)(a) <mailer.no-reply@reviveourgulf.org.nz> wrote:

Kia ora DOC,

My name is s 9 (2)(a) . I reside in s 9 (2)(a) .

I support the Revitalising the Gulf, Marine Protection Proposals package to establish new marine and seafloor protection areas in the Hauraki Gulf Marine Park / Tikapa Moana / Te Moananui-ā-Toi (the Gulf). I encourage Ministers to proceed as quickly as possible to implement these much needed changes.

The health of the Gulf is important to me because I visit the islands, I motor boat, I snorkel and/or SCUBA dive.

Over the last 60 years I have worked at various times in the gulf.

We have seen the direct benefit of marine protection at Goat Island / Te Hāwera-a-Maki, Whanganui-ā-Hei and the Poor Knights / Tawhiti Rahi. The proposal to protect a network of small areas in the Gulf will stimulate regeneration in these areas and beyond them.

The Government MUST act with urgency to set in place all 19 protection zones proposed. Expert opinion and successive State of the Gulf reports indicate that the Gulf is in a biodiversity crisis and close to ecological collapse. It is time to act for the benefit of future generations to improve the state of the Hauraki Gulf Marine Park.

Nāku noa, nā

s 9 (2)(a)

s 9 (2)(a)

s 9 (2)(a)

IMPORTANT: Please remove my contact information (email address & phone number) prior to publishing this submission in the public domain.

Sea Change

From: s 9 (2)(a)
Sent: Thursday, 27 October 2022 3:31 pm
To: Sea Change
Subject: Submission on Seachange - Aldermen Islands
Attachments: FW:_Attached_Image_**Do_Not_Reply**.eml

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

Please find attached the Aldermen Islands Reserve Group's submission on seachange as it affects that Island Group which includes a copy of UNESCO's document covering the Aldermen Islands.

Kind regards

s 9 (2)(a)

s 9 (2)(a)

s 9 (2)(a)

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 3:27 pm
To: Hamish Ross
Subject: FW: Attached Image **Do Not Reply**
Attachments: 0243_001.pdf

Kind regards

s 9 (2)(a)

s 9 (2)(a)

s 9 (2)(a) | Director
s 9 (2)(a)
s 9 (2)(a)
Website : www.elitekc.co.nz


From: s 9 (2)(a)
Date: Thursday, 27 October 2022 at 3:25 PM
To: s 9 (2)(a) s 9 (2)(a)
Subject: Attached Image **Do Not Reply**

ALDERMEN ISLANDS MARINE RESERVE GROUP

AUCKLAND, NEW ZEALAND

s 9 (2)(a)

27 October 2022

The Department of Conservation
New Zealand

EMAIL TO: seachange@doc.govt.nz

Re: Revitalising the Gulf – Marine Protection Proposals - Aldermen Islands (South - Eastern Coromandel)

The Aldermen Islands and their inshore waters 12 nautical miles off the coast of the South Eastern Coromandel are on the UNESCO List for protection. Attached is a document published by UNESCO confirming the Aldermen islands are on the UNESCO list for protection which also covers protection of its inshore waters.¹ The UNESCO document recommends “consideration should be given to extending the site by (c) including marine protection areas which may eventually be formed around island clusters...”

The Aldermen Islands are also recognised by the Waikato Regional Council and the Thames Coromandel District Council as an area of Outstanding Natural Beauty deserving of protection.²

The absence of proposals for the protection of the inshore waters of the Aldermen Islands is of grave serious international concern. The proposals for the Aldermen Islands have the appearance of a quick afterthought at the end of a large marine area. We **strongly urge** their protection as a full marine reserve for at least 1500 metres from their Mean High Water Mark, akin to those established at Whanganui-a-hei (Cathedral Cove) and at Mayor Island. The location of this offshore Island group a marine reserve, between these existing reserves creates a chain of offshore marine reserves. Making a Marine Reserve will have no impact on commercial fishing and recreational takes. There are many other nearby more accessible islands for recreational fishing. Additionally, a reserve at the Aldermen Islands will aid regeneration of stock available for both commercial and recreational fishing elsewhere.

We are well aware of the history of the Islands and their status; gifted by the Mana whenua to the Crown, on the condition they remain a reserve whilst retaining rights to gather titi. The protection of existing customary rights for the Mana whenua is understood and supported. To afford **no protection at all**, to the inshore waters is illogical and severally depreciates the

¹ <https://whc.unesco.org/en/tentativelists/5126/>.

² https://www.waikatoregion.govt.nz/assets/WRC/WRC-2019/TR201605_section_E2.pdf?fbclid=IwAR3xBluAjm7LD9AhIxyWzLayHRxZ_EuHoVkj8THtnXKUmIM-LU_Di1UB9c

laudable efforts proposed provide deep water protection nearby as well as the Reserve Status the Islands enjoy. The current proposals in respect of the Aldermen Islands are in our view poorly thought-out and fail to recognise their unique national and international status.

The Aldermen Islands inshore marine environment suffers from large growing areas of Kina barrens resulting from overfishing. This has greatly accelerated in recent years. There would seem to be little point in having protected the land of the Islands and the nearby deep seas, if their inshore waters receive no official protection of any sort.

There is also, no reason why parts of the Alderman Islands cannot be designated a marine reserve and allow recreational fishing in other parts, as is proposed for other islands and areas. Doing so will mean a great deal for the Coromandel Region as it will benefit from increased conservation tourism, as the marine protection of the Poor Knights Island Group has done for Northland.

It is important that in establishing marine boundaries that they are easily to understood and police. Making inshore waters of specific named islands off limits for fishing promotes understanding, acceptance and compliance aiding the conservation objectives.

The proposed random subdivision of the island areas into two levels of protection on an artificial east-west line is illogical, irrational and uninformed as it fails to take into account the geography of the Islands both above and below water. As a few examples, the world famous Honeycomb Caves area on the northern side of Hongiora Island, the lagoons on the northside of Middle Island and Severn Cove area on the southern side of Middle Island must at least be within the areas of the highest level of protection available. Simply drawing a straight line through the group is reminiscent of lazy colonial map drawing without reference to the area at all.

In summary, the Aldermen Islands Marine Reserve Group strongly urge that:

1. Marine Reserve Status be extended to the inshore waters of the Aldermen Islands of at least 1500 meters to their Mean High Water Mark to place both its land areas and inshore underwater conservation status on the same level; and
2. That any new reserve focuses in particular on Hongiora Island and the Middle Island group;

We ask to be included in all further communications and given an equal opportunity to all others make submissions on all proposals that may affect the conservation of the Aldermen Islands and their surrounding waters.

We would welcome showing you the Islands in person, should the opportunity arise in the future which will greatly enhance an understanding of decision makers of why the Aldermen Islands are on the UNSECO list.

Yours faithfully

s 9 (2)(a)

s 9 (2)(a)

Whakarua Moutere (North East Islands)

Description

Whakarua Moutere (or the North-East Islands) is a serial site of nine locations (eight of them island groups) extending along the northeastern coastline of the North Island. The northernmost cluster is the Three Kings Islands (latitude 34° 10' S) 60 km NW off Cape Reinga; the southernmost is the Aldermen Islands (36° 58' S) 20 km off the eastern coast of the Coromandel Peninsula.

The nine clusters in the site are:

- Three Kings Islands/Manawatawhi;
- Te Paki and North Cape Reserves;
- Poor Knights Islands;
- Hen and Chickens Islands;
- Mokohinau Islands;
- Hauturu/Little Barrier Island;
- Cuvier Island;
- Red Mercury and lesser Mercury Islands; and
- Aldermen Islands

Statements of authenticity and/or integrity

Most of the islands have the highest level of terrestrial legal protection available (Nature Reserves or Wildlife Sanctuaries). This level of protection equates with IUCN's category 1a protected area. All sites are strictly managed by the Department of Conservation.

In the longer term however, consideration should be given to extending the site by:

- (a) adding Mayor Island (Tuhua) which has outstanding geological features and landforms.
- (b) adding Ohinau Island, the privately-owned Murimotu Island off North Cape, and some of the smaller privately-owned islands in the Cavalli Islands group; and
- (c) including marine protected areas which may eventually be formed around the island clusters (or Te Paki/North Cape).

Only two of the island groups currently have marine reserves in their surrounding seas. The seas around the Three Kings Islands, the benthic communities of Spirits Bay and Tom Bowling Bay, Parengarenga Harbour, and the rock wall and fish communities of the Poor Knights Islands are outstanding marine ecosystems with high levels of species diversity and endemism. An outstanding feature of these marine environments is their relatively unmodified nature, with high water clarity arising from low levels of human-induced sedimentation.

All the Whakarua Moutere islands have prime conservation functions as 'sanctuary islands' where species threatened on the mainland can recover.

 [New Zealand](#)

Date of Submission:

30/03/2007

Criteria: [\(vii\)](#)[\(viii\)](#)[\(ix\)](#)[\(x\)](#)

Category: Natural

Submitted by:

Department of Conservation

State, Province or Region:

Northland to Bay of Plenty

Ref.: 5126

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Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 3:55 pm
To: Sea Change
Subject: Revitalising the Gulf

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

I am an occasional diver and fisherman who has enjoyed being able to feed my family (on a good day) from the assets we all enjoy in the Hauraki Gulf since the early 1970s.

I have seen the benefits of marine reserves such as Goat Island, Cathedral Cove and further afield but have also seen the loss of so many resources from over fishing and totally inappropriate fishing methods such as bottom trawling.

I am totally in favour of extending the reserves and protected areas as outlined, even though this potentially limits my catch zones. Extending them even further would also get my support.

The rules and regulations should apply equally to all Kiwis, irrespective of race or racial "identity". So I am totally opposed to having different rules for mana whenua (or any other subset of Kiwis). It creates a gaping hole that can be exploited by anyone who "identifies as Maori", for which there is no legal definition. It also makes policing far more difficult.

So a good move, but there should be one set of rules for all.

s 9 (2)(a)
s 9 (2)(a)

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 4:02 pm
To: Sea Change
Subject: Support for Enhanced Marine Protection for Tikapa Moana

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

From: s 9 (2)(a) s 9 (2)(a)
s 9 (2)(a)

Kia ora.

I wholeheartedly support ALL enhanced marine protection proposals for Tikapa Moana. Having lived on it's shores and in it's waters most of my life, it is part of me and I am part of it. Tikapa Moana ko au, ko au tikapa moana.

I sense the lack of marine abundance and biodiversity. If the presence of indicator species such as resident marine mammals, large flocks of feeding gannets and leaping shoals of kahawai reflect plenty of food and habitat - these are no longer common off our beach, even with the nearby presence of a small marine reserve.

I see the huge plumes of sediment that flow from the land into Te Whanganui o Hei - Mercury Bay, whenever we have heavy rain. I believe to have a healthy ocean we must have a healthy land. Like elsewhere we have increased housing intensification with the resulting implications for freshwater demands and downstream degradation. This also brings increased pressure on "recreational" fishery species.

I grieve when I see the barge heading out to dump it's load of dredgings from the Whitianga River, canal housing development and marina. Every other marina and harbour is doing similar. What damage do they do, where is it dumped?

We can't ignore the increasing effects of climate change and global warming. We already have exotic pest seaweeds in our waters.

The Hauraki Gulf Marine Protection Bill can't happen soon enough for me ...

Na mihi nui

Ko s 9 (2)(a) taku ingoa.

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 4:04 pm
To: Sea Change
Subject: Marine reserves on an around the coromandel peninsula

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Recorded

To whom it may concern,

My family have been involved with the commercial crayfish industry for the last 29 years. In the Cra 2 area an mostly in 906 .

This submission is is not in favour of these extra no go areas an no fishing zones, The extension of the hahei reserve will directly effect us with appropriate of s 9 (2)(b)(ii) quota being caught in the bay an s 9 (2)(b)(ii)

It's fine to say just catch it elsewhere but it's not as easy as that , it puts more pressure on a smaller space an more tension on fisherman fishing on top of each other , We find at present we have MPI closing off grounds due to Culerpa weed EWC trying to close off areas in its 10 year coastal plan an now we have DOC an it's intensions of closures for the hauraki gulf (an how did the pacific coast side get tied up with the hauraki gulf all the way down into the bay of plenty) Also add rahui to the list of closed areas with next to little scientific reasoning , An over the next ten years aquaculture closed fishing ground is on the agenda for much of the east coast.

Being hit by so many applications for closures is daunting to be fair I'm not sure if it's going to be fiscally viable to fish an earn export dollars an bring money into a small community if all of the above come to fruition.

We do have available our catch history in regards to our log book program with Cra 2 if that's required Regards s 9 (2)(a)

Sent from my iPad

Sea Change

From: s 9 (2)(a) s 9 (2)(a)
Sent: Thursday, 27 October 2022 4:19 pm
To: Sea Change
Subject: Waikato Regional Council Submission on Revitalising the Gulf: Marine Protection Areas
Attachments: Waikato Regional Council Feedback on Revitalising the Gulf - Marine Protection Proposals.pdf; Attachment A - Mapping_rocky_reef_habitats_on_the_eastern_Coromandel_Peninsula_with_multispectral_satellite_imagery.pdf; Attachment B - Follow-up meeting with council marine experts on Sea Change MPAs HTML.htm

Follow Up Flag: Follow up
Flag Status: Completed

Kia ora,

Thank you for the opportunity to provide feedback on Revitalising the Gulf - Marine Protection Areas. Please find attached the Waikato Regional Council's submission.

Waikato Regional Council looks forward to being involved in further engagement regarding the development of Revitalising the Gulf- Marine Protection Areas.

Should you have any queries regarding the content of this document please contact myself or s 9 (2)(a)
s 9 (2)(a)

Please confirm receipt.

Ngā Mihi,
s 9 (2)(a)

s 9 (2)(a) | s 9 (2)(a) | Policy Implementation, Science, Policy and Information
WAIKATO REGIONAL COUNCIL | Te Kaunihera ā Rohe o Waikato

s 9 (2)(a)
s 9 (2)(a)

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28 October 2022

Department of Conservation - Te Papa Atawhai
18-32 Manners Street, Wellington 6011

Email: seachange@doc.govt.nz

Tēnā koe

Waikato Regional Council Feedback to Revitalising the Gulf – Marine Protection Areas.

Thank you for the opportunity to provide feedback on the information document: Revitalising the Gulf – Marine Protection Areas. As a result of the timing of submission and local by elections this matter was unable to be placed before our elected members. Our submission will be retrospectively shared with members at the next available opportunity. The attached submission has been signed under delegation by the Director of Science, Policy and Information.

Should you have any queries regarding the content of this document please contact s 9 (2)(a)

s 9 (2)(a) directly on s 9 (2)(a) or by email

s 9 (2)(a)

Nāku iti noa, nā,

s 9 (2)(a)

Director Science, Policy and Information

Feedback from Waikato Regional Council on the information document: Revitalising the Gulf – Marine Protection Areas.

Summary

1. We appreciate the opportunity to provide feedback on the information document Revitalising the Gulf – Marine Protection Areas.
2. The use of additional tools to manage the effects of activities on the biodiversity of the Gulf is supported. The proposed new tools – High Protection Areas (HPAs) and Seafloor Protection Areas (SPAs), have the potential to achieve positive outcomes for the marine’s fauna and flora communities and ecosystems. We agree that the tools could provide an increase on the abundance of fish stocks and will also help building our understanding of marine ecosystems.
3. We understand that the extension of the protected area for Whanganui-a-Hei (Cathedral Cove) has the potential to have positive effects for the area. However, we consider that further discussion with mana whenua is appropriate to evaluate the most appropriate protection framework for Cathedral Cove given the potential impact on customary rights and practices.
4. It is recommended that the Department of Conservation – Te Papa Atawhai (DOC) and Ministry for Primary Industries (MPI) work to ensure comprehensive and meaningful engagement with mana whenua moving forward, especially when developing the Customary Practice Management Plans (CPMPs). It is also recommended that comprehensive and meaningful engagement should continue to be undertaken with key stakeholders who may be impacted by proposals.
5. We take this opportunity to raise the issue of managing biosecurity risks as a key component of protecting native biodiversity. To this effect, we propose an amendment to the HPAs provisions to help prevent the spread of marine pests.
6. It is also considered that there is a need to expand the protected areas in the future to better provide for marine biodiversity. In this regard we provide two reports in support of this proposal and as evidence for potentially assessing other areas for protection. We note there are opportunities for expanding the protected areas within the Eastern side of the Coromandel Peninsula. However, before progressing to further stages, DOC should ensure the proposed tools are tested and able to deliver the proposed benefits, and that engagement with stakeholders is undertaken
7. We also consider that in creating marine reserves and new protection zones suggests active compliance, monitoring, and enforcement (CME) activity by the regulator to ensure the integrity of these areas. We urge DOC to carefully consider what resources would be required to effectively deliver on CME functions and to make sufficient provisions for these.

Submitter details

Waikato Regional Council

s 9 (2)(a) [Redacted]
[Redacted]
[Redacted]

Contact person:

s 9 (2)(a) [Redacted]
s 9 (2)(a) [Redacted]
[Redacted]
[Redacted]

Is there anything you would like Ministers to consider when deciding the marine protection tool to be applied at these sites? For instance, are there other ecological values you would like them to be aware of?

8. We would like to highlight the importance of comprehensive and meaningful engagement with mana whenua. We also note the importance of engagement with key stakeholders, including any local groups and local communities. Moving forward, it is essential to confirm with mana whenua and key stakeholders if the proposed areas are acceptable. Further, we strongly recommend that central government must ensure there is appropriate funding for engagement during the engagement phase to develop the Customary Practice Management Plans (CPMPs). We recommend that central government must clarify the roles (and opportunities for input and influence) for mana whenua, local authorities, stakeholders, and communities when developing these plans.
9. The discussion document mentions the options for protection tools in the areas adjacent to Whanganui-a-Hei and Cape Rodney-Okakari Point marine reserves. We consider it appropriate to further consult with mana whenua to evaluate which protection tool is appropriate to be put in place, considering the potential impacts on customary rights in case a marine reserve is created. Engagement should be comprehensive and meaningful, providing opportunities for individuals to be heard. We also note that other key stakeholders should also be included in any further consultation. Both proposed protection tools will result in potential restrictions for the community as a whole.
10. We are aware that members of the local Whitianga community have discovered black coral (*Antipatharia* sp.) east of Te Pare point, approximately 800m southeast of the Whanganui-a-Hei Reserve. We understand that contact is being made with taxonomic experts to provide validated confirmation of the coral. Given this is a protected species, the area requires further surveying and could be considered for seafloor protection. This was mentioned at the meeting with DOC on 8 June 2020 (communication to Irene Pohl, please see Attachment B).
11. The Council has published two reports that align with the proposal and are of relevance. The first report (Attachment A) is a satellite-based survey that demonstrates 'kina barrens' as more extensive (as a percentage of habitat coverage) outside of the Whanganui-a-Hei Reserve than inside. The report provides commentary on the effects of sedimentation and overfishing in our CMA. The second report¹ provides a subtidal seagrass meadow map for Slipper Island which is within one of the proposed areas. Subtidal seagrass is a rare yet highly valuable habitat subject to multiple anthropogenic impacts and we support its protection.
12. We understand that DOC have a wealth of evidence regarding the benefits from protecting marine areas in terms of recovery of biodiversity, such as the reduction of urchin barrens as a result of the increase in size and numbers of snapper and rock lobster². Moving forward, we advocate for appropriate monitoring for the Marine Protected Areas (MPAs). This could include using remote techniques, such as satellite monitoring for certain habitats to assess the changes in biodiversity like changes on rocky reef habitats. Council is open to explore multi-agency effort to identify synergies and operating efficiencies.
13. Further consideration should be given to the protection of Great Mercury Island – Ahuahu, as stated in the 2017 Sea Change Marine Spatial Plan, but that is absent in the current proposal. As noted in Attachment B, DOC concluded that *“Overall, agencies consider that the outstanding biodiversity values associated with the Mercury Islands (and towards the coast) would warrant area-based protection”*. Council holds data that identifies the biodiversity values of Ahuahu and

¹ [Subtidal seagrass surveys at Slipper and Great Mercury Islands | Waikato Regional Council](#)

² <https://www.doc.govt.nz/documents/science-and-technical/inventory-monitoring/im-toolbox-marine-reserves/cape-rodney-report-card.pdf> and <https://www.sciencedirect.com/science/article/pii/S2212041618300524>

other islands in this group. However, DOC then concluded that *“the team suggests discarding this proposal as it is too small and would not provide any effective protection to the biodiversity values associated with the Mercury Islands/Kennedy Bay area. The team suggests flagging this area as a potential gap in the MPA network given the area’s outstanding biodiversity values”*.

14. We acknowledge that the proposed Ahuahu MPA may have been too small, but question why there was no attempt to correct this. Many of the MPAs in the current proposal were substantially altered with respect to boundaries, other areas such as the Noises were added in for protection, but to our knowledge no attempt was made to reconfigure an effective MPA in this location.
15. It is noted that the absence of the Ahuahu MPA leaves a gap in the network, noticeably in the north-eastern section of the Coromandel, given the distance between Cape Colville and the Whanganui-a-Hei Reserve. The combined proposed protection falls below the 20% target, which the Ahuahu MPA would have helped to address. Seafloor protection would safeguard the biodiversity of Ahuahu from certain physical disturbances and cascading effects of predator removal and would limit the impacts of dredging should the current rahui be lifted. The Council has commissioned the University of Auckland to map subtidal habitats around the Mercury Island group and provide assessment of biodiversity and ‘reef health’. This work is ongoing, but there is at least some early indication of kina barrens being present at the island group and low abundance/density of rock lobster. There are multiple ecological reasons, in addition to paragraph 15, highlighting why further consideration should be given for protection in the north-eastern Coromandel under the current legislative opportunity.
16. Management of biosecurity risks is a key component of protecting native biodiversity. Marine pests can permanently alter the ecosystem, predated on or smothering native biodiversity. There are very few tools available to eradicate marine pests, which makes preventing their spread crucial. Whilst we acknowledge the efforts of the Top of the North Marine Biosecurity Partnership to progress an inter-regional marine pathway management plan, we encourage DOC to consider including marine biosecurity provisions in HPAs rules as a minimum. This could include amending the activities permitted to read “normal ship operations such as piloting and anchoring a vessel, where the Level of Foul does not exceed 2 and the anchor and chain are cleaned prior to moving”. We support the prohibition of discharge of ballast (unless for the immediate safety of the ship) as ballast water discharge is a key pathway for spread of marine pests.

What impact will the marine protection proposals have on you or your interests?

17. The use of a HPAs and SPAs framework is acknowledged as a useful mechanism. Noting that the combination of tools have the potential to be effective than what could be achieved through provisions included in a reviewed draft Waikato Regional Coastal Plan (WRCP).
18. We note that land-based activities could negatively affect the protected areas. As an example, residential development near protected areas could lead to an increase in sedimentation in these areas. This could have a detrimental effect on the marine’s fauna and flora communities and ecosystems. We are currently working on the implementation of the National Policy Statement for Freshwater Management and National Environmental Standards for Freshwater, and we consider this work could partially mitigate this issue when addressing acceptable levels of nutrient and sediment from rural and residential activities.
19. We consider there is a potential unintended consequence to the Council from this proposal. Communities have incorrectly concluded that the Council is aiming to restrict and prohibit fishing in the Firth of Thames through the WRCP review. It is recommended that MPI and DOC provide a user-friendly diagram capturing all central government outputs regarding fishing proposals and publishing this in an accessible way for our coastal communities. This will assist our communities

to understand the different plans, areas of coverage and their contents. We envision the potential for further confusion with the release of the Hauraki Gulf Fisheries Plan. Information that is well communicated and easy to understand for our communities will assist in alleviating the problem of misinformation in our community.

Do you think there are any additional costs or benefits we haven't considered? For instance, those specific to individual operators?

20. It would be beneficial to explore other areas for protection that could result in a more overarching and functioning network of protected areas in the future. Regarding potential new areas we consider the northern east coast of the Coromandel Peninsula would require further detailed discussion.
21. The information document did not capture how monitoring will be undertaken for the new proposed areas. We consider that monitoring and enforcement, with associated resources, is essential to ensure the success of the proposed areas. This will also provide the data to inform a potential second round of assessment for new proposed areas of protection.

Mapping rocky reef habitats on the eastern Coromandel Peninsula with multispectral satellite imagery

Prepared by:

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Mapping rocky reef habitats on the eastern Coromandel Peninsula with multispectral satellite imagery

Jared Kibele and Nick T. Shears

November 30, 2017

Abstract

With increasing anthropogenic pressure on coastal marine ecosystems there is a greater need than ever to develop cost-effective methods of gathering information on marine habitats at large spatial scales to inform management. However, traditional methods of habitat mapping rely heavily on time consuming and expensive direct observation by divers and produce unverified habitat maps with low spatial resolution. This study employs newly developed approach (termed MORE-MAPS) to map dominant subtidal habitat types from Cook's Beach to Hot Water Beach on the Coromandel Peninsula. The MORE-MAPS method includes rapid collection of ground-truth imagery with a drop camera system, classification of images into 4 broad-scale habitat types (Mixed Weed, *Ecklonia* Forest, Barrens, and Soft-sediment), mapping these habitats over larger study area using multispectral satellite imagery, and providing an accuracy assessment of the habitat map. Additionally, a map of estimated bathymetry is provided.

1165 benthic ground truth photos were collected, classified, and georeferenced. Using WorldView-2 satellite imagery, a bathymetric map of the study area was produced with an RMSE of 1.61 m, and broad-scale habitats were mapped to a depth of approximately 20 m with an overall mapping accuracy of 73% across the entire study area. Within the study area, mapping accuracy varied with turbidity from 42% overall accuracy in the most turbid region to 78% overall accuracy in the least turbid region.

The area examined also included the Whanganui A Hei (Cathedral Cove) Marine Reserve which allowed assessment of the proportions of different habitat types inside and outside the marine reserve. The proportion of Mixed Weed habitat inside and outside the reserve was similar (10% and 11% respectively), Barrens were lower in the reserve (5% vs 20%) and *Ecklonia* forest higher (85% vs 69%). These differences are consistent with previous studies that suggest long-term protection from fishing can facilitate the shift from urchin dominated barrens back to a natural kelp dominated state.

This study demonstrates that the MORE-MAPS approach provide a cost-effective approach to mapping subtidal marine habitats to depths of ~20 m on open coasts with good water clarity. Accuracy was reduced in more turbid areas, indicating that the method will only be suited to mapping shallower

water habitats under such conditions. The quantification of differences in habitats between reserve and fished sites demonstrates the wider application of these methods for understanding human impacts on marine ecosystems and also monitoring temporal variation in the distribution of important marine habitats.

1 Introduction

Thematic maps of nearshore subtidal habitats are vitally important to marine spatial planning (MSP) (Foley et al., 2010; Saarman et al., 2012), coastal risk assessment (Warren et al., 2016), conservation (Hamel and Andréfouët, 2010), and ecological studies (Parsons et al., 2004; Leleu et al., 2012; Boström et al., 2011). Given the worldwide trend toward MSP (Force, 2009; Li, 2006; Boyes et al., 2007) and the increasing application of landscape ecology methods to the marine environment (Boström et al., 2011; Wedding et al., 2011), there is a growing need for subtidal habitat maps (Andréfouët, 2008; Stamoulis and Delevaux, 2015; Wedding et al., 2011). Remote sensing has long been recognized as the most efficient means of generating habitat maps over large areas at scales relevant to MSP and ecological studies (Green et al., 1996) but, due to the complexities involved, these methods typically require the involvement of remote sensing specialists. In light of this increasing demand for habitat maps, there is a need, particularly in data-poor developing countries (Andréfouët, 2008; Clifton, 2009; Cabral et al., 2015), for a system of habitat map production, comprising low cost tools and methods, that can increase map production capacity (i.e., the capacity of scientists and resource managers without extensive remote sensing expertise to produce maps of submerged habitats) (Andréfouët, 2008).

The removal of fishing pressure by use of no-take marine reserves in New Zealand can rehabilitate degraded rocky reef ecosystems over a time scale of several decades (Shears et al., 2006; Shears and Babcock, 2003). With rehabilitation and preservation of ecosystems as goals of reserve status, ongoing monitoring of marine reserves is required to objectively justify reserve status (Cole et al., 2003). However, traditional diver surveys are expensive, time consuming, and provide poor spatial coverage in comparison to modern remote sensing methods (Green et al., 2000; Mumby et al., 1999). The use of drop camera surveys and aerial habitat mapping has long been suggested as an economical and effective alternative to diver surveys (Cole et al., 2003), and the increasingly difficult liability issues and associated costs of research diving in New Zealand favor an “above the water” approach now more than ever.

Studies in New Zealand’s oldest no-take marine reserve, Cape Rodney to Okakari Point, have demonstrated the viability of monitoring ecosystem rehabilitation through habitat mapping (Leleu et al., 2012; Ayling, 1978; Parsons et al., 2004). These studies demonstrated that previously noted shifts in the distribution of habitats (specifically, the shift from urchin dominated barrens to *Ecklonia* dominated kelp forest (Shears and Babcock, 2003)), are clearly detectable via habitat mapping.

However, the habitat mapping methods used in those studies are not well suited for repeated use in a cost-conscious reserve monitoring context. The first

habitat mapping of the entire reserve (Ayling, 1978) provided a vital baseline map of habitat distribution shortly after the removal of fishing pressure through a staggering quantity of direct, pre-GPS underwater observation and pre-GIS, hand-drawn cartography. Parsons et al. (2004) used diver operated video transect methods to delineate the transition from barrens to kelp forest in a portion of CROP, but their methods required expensive acoustic positioning equipment, laborious data processing steps, and interpolation between data points that produces jagged, unrealistic divisions between habitats. Due to these limitations, it is difficult to accurately and efficiently map large areas using this method. Leleu et al. (2012) combined numerous direct observation and remote sensing methods (e.g., towed diver surveys, drop camera, towed video, manual interpretation of aerial imagery, side scan sonar) to map habitats throughout CROP and out into some of the bordering areas. They were able to map a reasonably large area and further elucidate the shift from barrens to kelp forest that has taken place in CROP since the elimination of fishing, but the methods employed, though certainly more efficient than the original survey (Ayling, 1978), still require a level of expenditure and labor that render them impractical in a continuous reserve monitoring context.

High resolution multispectral satellite imagery, such as that available from the WorldView-2 (WV2) satellite (DigitalGlobe, 2012), can provide a comparatively objective, efficient, and cost-effective means of mapping submerged habitats over large areas (Mumby et al., 2004; Xu and Zhao, 2014; Green et al., 2000). The successful mapping of submerged habitats via multispectral image classification depends largely on water column correction (WCC) methods that can compensate for the attenuation of light in seawater (Zoffoli et al., 2014), but most WCC methods were developed for clear oligotrophic tropical waters and are complex and difficult, if not impossible, to implement in the comparatively turbid temperate waters of New Zealand. Recent work, conducted at the University of Auckland's Leigh Marine Laboratory (Kibele, 2016; Kibele and Shears, 2016; Kibele, 2017), has resulted in a suite of methods and open source software, referred to as MORE-MAPS, that are designed for use across a wide range of water clarity conditions, including the temperate waters of north eastern New Zealand. The methods and software that comprise MORE-MAPS address the entire habitat mapping process, from ground truth data collection and processing with the free and open source software (FOSS) Benthic Photo Survey (BPS) (Kibele, 2016), through to depth estimation (Kibele and Shears, 2016), image processing, water column correction, and accuracy assessment with the FOSS OpticalRS Python library (Kibele, 2017). MORE-MAPS showed promise as a tool for monitoring habitat distribution when it was used to map broad scale habitats to depths of 20 m in and around CROP with better accuracy and lower cost than the habitat mapping methods previously employed in the same reserve (Kibele, 2017).

The present study will use these newly developed methods to map subtidal reefs along a 10km stretch of coast on the Coromandel Peninsula, from Cook's Beach to Hot Water Beach (Fig. 1). This area includes the Whanganui A Hei Marine Reserve (established in 1992) and will therefore allow an assessment of the efficacy of the reserve in rehabilitating the local ecosystem. In addition to their function as a one-off assessment, the maps and ground truth data generated may prove to be

valuable baselines for future studies. Furthermore, the repeated application of these, or similar, methods as additional satellite imagery becomes available could prove to be an efficient and cost-effective tool for ongoing marine reserve monitoring and assessment of habitat distribution as a proxy for the health of rocky reef ecosystems.

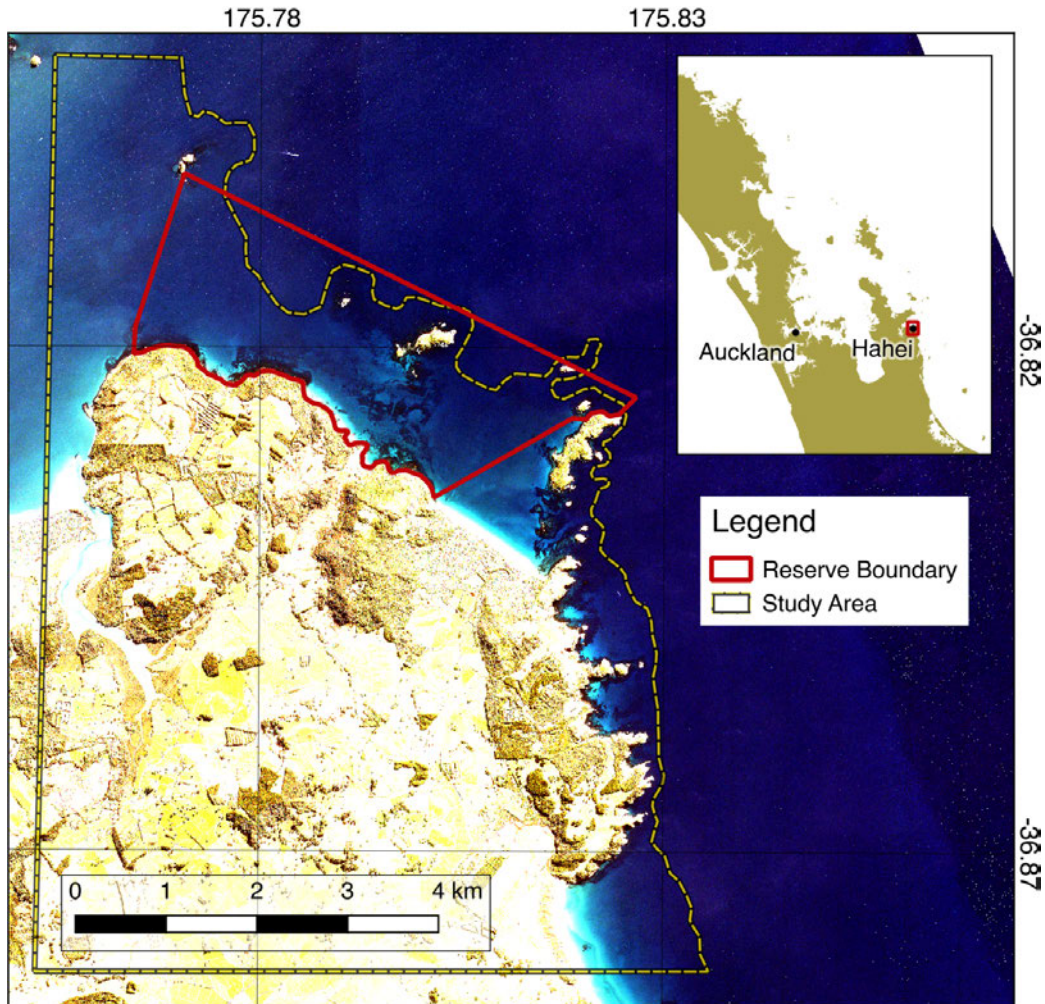


Figure 1: RGB composite of the 8-band WV2 imagery used in this study. The Te Whanganui A Hei Marine Reserve boundary is displayed in red and the image classification area out to the approximate 20 m depth contour is shown in yellow.

2 Materials and Methods

2.1 Habitat Categories

Several similar classification systems for rocky reef habitat types have been devised for use in north eastern New Zealand (Ayling, 1978; Gordon, 1976; Grace, 1983; Shears et al., 2004; Leleu et al., 2012; Parsons et al., 2004). The system presented by Shears et al. (2004) has been well validated but, in order to create a habitat

map from satellite imagery, the classification system must include only classes which can be distinguished on the basis of image colour spectra. Stated simply, habitats must be different colors in order to be discriminated via aerial or satellite imagery. For instance, coarse and fine sediment may constitute different habitats from an ecological perspective but, assuming the sediments are composed of the same material, their spectral signature (i.e. their colors) will be nearly identical and, therefore, indistinguishable.

With this limitation in mind, a set of simplified habitat categories, based on Shears et al. (2004) was devised (Table 1) and has been previously used for mapping reefs with multispectral satellite imagery in north eastern New Zealand (Kibebe, 2017). The *Caulerpa* mat and red foliose algae categories (Shears et al., 2004) were excluded because they did not occur frequently enough or over large enough areas for the reliable derivation of a spectral signature. The encrusting invertebrates category was likewise excluded because it typically occurs on vertical walls which are not visible from the satellite’s viewing angle. The sponge flats category was merged with the *Ecklonia* forests category because they occur in relatively deep water (>18 m and >10 m respectively) where WCC is less reliable (Kibebe, 2017) and are likely to be spectrally similar due to the presence of *Ecklonia radiata*. “Urchin barrens” and “Turfs of algae” are typically dominated by coralline algae and short turfs and are therefore spectrally similar. These two habitats both lack large brown macroalgal canopies so were combined into a “Barrens” category. Thus, these simplified habitat categories (Table 1) represent broad-scale, spectrally distinct habitats.

2.2 Study Area and Satellite Imagery

The stretch of coast from Cooks Beach to Hot Water Beach, encompassing the Te Whanganui A Hei (Cathedral Cove) Marine Reserve, has been the locale for numerous rocky reef ecology studies both before (Choat and Ayling, 1987) and after the reserve was established in 1992 (Shears et al., 2008; Shears, 2002; Kelly et al., 2000; Willis et al., 2003; Willis and Millar, 2005). Situated on the eastern side of the New Zealand’s Coromandel Peninsula on the southern edge of Mercury Bay, water clarity can be affected by high sedimentation rates from the Whitianga and Purangi estuaries (Reeve, 2008). Heavy sediment loads and spatial variation in water clarity are significant challenges to optical remote sensing methods (Green et al., 2000).

High resolution (2 m), 8-band WorldView-2 (WV2) imagery for this study was supplied by the DigitalGlobe Foundation, free of charge, as an imagery grant. The first of the two WV2 image scenes was acquired by the satellite at 10:30 local time on 16 August, 2014 with a solar elevation of 33.2°, a solar azimuth of 32.4°, a satellite elevation of 59.8°, a satellite azimuth of 22.5°, and an off nadir view angle of 26.5°. The second scene was acquired 17 seconds later with nearly identical solar angles, a satellite elevation of 63.9°, a satellite azimuth of 25.4°, and an off nadir view angle of 23.0°. The first scene covers the study area from approximately the middle of the reserve to the east and the second scene covers from west of the study area to just short of the eastern corner of the reserve, so the scenes overlap from just east of Moturoa Island in the middle of the reserve to the eastern edge of Mahurangi Island. As will be described below, the scenes were processed separately and the

Table 1: Broad-scale habitat types based on a simplification of the classification scheme presented in Shears et al. (2004).

Habitat	Description
Mixed Weed	Rocky reef dominated by large brown algae other than <i>Ecklonia radiata</i> . <i>Ecklonia</i> , if present, is sparse and mixed with <i>Carpophyllum</i> spp. Includes shallow <i>Carp.</i> , <i>C. flexuosum</i> forest, and Mixed algae categories from Shears et al. (2004).
<i>Ecklonia</i>	<i>Ecklonia radiata</i> forming a canopy over rocky reef. The canopy may be sparse on deep reefs but is generally near continuous with occasional <i>C. flexuosum</i> plants mixed in. Includes <i>Ecklonia</i> forest and Sponge flats from Shears et al. (2004).
RTB	RTB is an abbreviation of Rock, Turf, and Barrens. Accordingly, this category includes bare rock, turfing algae (e.g. articulated corallines and other red turfing algae), and urchin barrens dominated by crustose coralline algae. Essentially, any rocky reef areas not dominated by large brown algae fall into this category. Includes Cobbles, Urchin barrens, Turfing algae categories from Shears et al. (2004).
Sediment	Bottom covered in sediment. Includes gravel and shell rubble as well as coarse or fine sand. No comparable habitat in Shears et al. (2004). Only reef habitats were considered.

resulting habitat maps were stitched together.

For benthic habitat mapping, imagery should be free of cloud cover, large variations in water clarity, and excessive sunglint. Ideally, the image acquisition date should be close as close as possible to date of ground truth data collection to avoid the potential impacts of intervening shifts in habitat distribution. The imagery used (Figure 1) does suffer somewhat from heterogeneous water clarity due to apparent sediment outflow from the Whitianga Estuary on the western edge of the study region. Furthermore, the combination of low solar elevation with steep coastal cliffs caused some nearshore areas to be covered with deep shadow. The scenes used, despite these shortcomings, were chosen from the DigitalGlobe catalog as the best available imagery for mapping habitats in the reserve.

2.3 Field Data

Drop camera surveys of the benthos within the study area were conducted from a small boat from 6 - 8 February 2017. The surveys were conducted for use with the

Benthic Photo Survey (BPS) ground-truth system (Kibele, 2016). The drop camera system used was an improved version of the one used with MORE-MAPS in the Cape Rodney to Okakari Point Marine Reserve (Kibele, 2017). The new system (Figure 2) comprises a purpose-built weight (~5 kg) and camera stand, a GoPro Hero 4 camera in a waterproof housing, a coaxial cable to transmit WiFi (CamDo Solutions, 2017), a mobile phone running the GoPro Capture app to trigger image capture, and a polypropylene rope to take the lifting strain off of the cable. The coaxial cable was run through the center of the single braid waterski tow-rope to facilitate ease of handling. The camera was positioned 1 m from the bottom of the weight, pointing down. Tests conducted in a seawater tank determined that GoPro images taken using this setup cover an image area of approximately 1.8 m^2 . A Sensus Ultra depth logger (<https://reefnet.ca/products/sensus/>) was attached to the camera housing, and a hand held Garmin 60csx GPS was positioned on the boat as close as possible to the camera. The GoPro's clock was synchronized to the GPS ($\pm 1\text{ s}$) at the start of each day's data collection to ensure correct geolocation of the photos.

Target transect lines running perpendicular to the coast (down the depth gradient) were drawn prior to field work, based on visual estimation of habitat types, in an effort to stratify the sampling across habitat types (Table 1) and provide spatially distributed coverage throughout the study area (~200-400 m apart). In the interest of efficiency, the predetermined transect lines were used as general guidelines rather than exact positions. The vessel was navigated to the approximate position of the upwind end of a transect line and brought to a halt. The camera handler would then lower the weight and camera (with depth logger attached) until the weight made contact with the seafloor while the GPS continually logged position (at 4 second intervals), above water, on the boat. The floats positioned at the top of the camera stand ensured that the stand remained vertical at all times. The boat driver monitored the camera image on the mobile phone using the GoPro Capture app, and pressed the image capture button when the camera stand was on the bottom. The camera handler would then pull in a few meters of line to lift the stand off the bottom, and the boat driver would drift, or very slowly drive, the boat ~10 - 15 m down the transect, stop the boat, and repeat the process. Every effort was made to keep boat directly over the camera, but some offset was unavoidable, particularly in deeper water.

After returning to shore, the photos, GPS log, and depth log were loaded into BPS, and positions and depths were automatically assigned to each photo based on digital timestamps (Kibele, 2016). Then, in order to maximize the reuse potential of the ground-truth data set, BPS was used to assign visually estimated proportions of the cover types listed in Table 2 to each photo rather than simply assigning one of the broad-scale habitats (Table 1). This allows for greater flexibility in the visualization and analysis of field data.

For use as image classification ground-truth, the proportions were converted to broad-scale habitat types according to the rubric in Table 3. Out of 1165 benthic photos, this rubric left 347 unclassified photos (Figure 3). Visual examination of the unclassified photos revealed them to mostly be of transitional (e.g., half sand and half *Ecklonia* dominated reef) or, less commonly, indeterminate bottom type (e.g.,

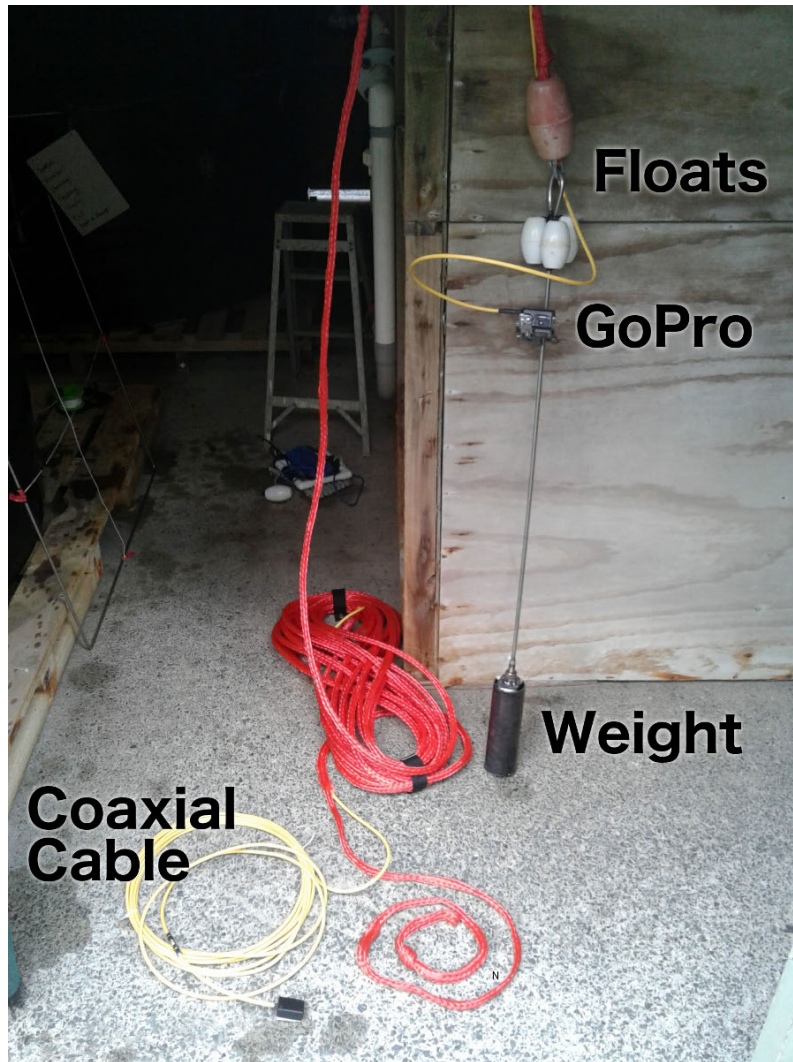


Figure 2: The GoPro drop camera system used to collect ground truth images. The depth Sensus Ultra depth logger is attached to the camera housing but is not visible in this figure.

view of a very small portion of the bottom due to uneven terrain, or a mixture of bottom covers that doesn't neatly fit into any of the categories in Table 1).

2.4 Lidar Data

MORE-MAPS can, and has, been used without additional depth data beyond that which is derived from the depth logger used with BPS (Kibele, 2017). However, the depth estimates (Kibele and Shears, 2016), subsequent water column correction, and image classification can be improved with additional depth measurements. In this case, high resolution bathymetric lidar data were available (from Waikato Regional Council) for a portion of the study area.

The numerous individual ascii point cloud files received from the council were merged and converted to OGR virtual file format using standard Unix command

Table 2: Bottom cover types from drop camera survey. Visual estimates of these cover types were assigned to each photo and subsequently used to assign each photo to one of the broad scale habitat types in Table 1.

Bottom Cover	Description
Sand	Fine to medium grained sediment.
Rubble	Coarse sediment, gravel, and/or broken shell.
Rock	Bare rock with very little encrustation. Generally represented by cobbles.
Barrens	Crustose coralline algae with urchins present.
Turf	Articulated coralline algae and other red turfing algae.
Ecklonia	<i>Ecklonia radiata</i> canopy coverage.
Brown Algae	Any large brown macroalgae other than <i>Ecklonia radiata</i> . In practice, this was most often <i>Carpophyllum spp.</i> .
Other Reef	Any reef cover that could not be assigned to another category.

Table 3: Rubric for converting image proportions of bottom cover types (Table 2) to broad-scale habitat types (Table 1).

Habitat	Bottom Cover Conversion Rule
Sediment	$Sand + Rubble \geq 90\%$
RTB	$OtherReef + Rock + Barrens + Turf \geq 0.8$
Ecklonia	$Ecklonia \geq 70\%$ and $BrownAlg \leq 10\%$
Mixed Weed	$BrownAlg \geq 30\%$ and $BrownAlg + Ecklonia \geq 70\%$

line tools. GDAL (GDAL Development Team, 2016) command line tools were then used to convert the point data to a raster of the same extent and 2 m resolution as the WV2 coverage of the study region (Figure 1). Point depths were averaged within raster cells, and cells that contained no points were masked.

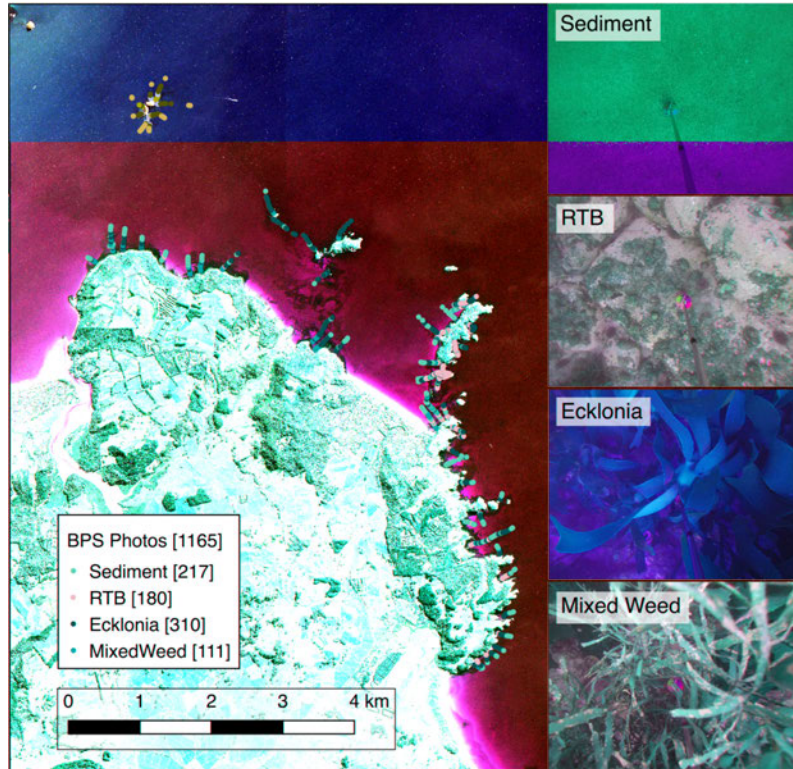


Figure 3: The Benthic Photo Survey (BPS) ground truth points used to ground truth the habitat map are displayed with marker colors that correspond to the habitat type at each point. The right side of the figure shows representative benthic photos of the 4 broad-scale habitat categories used in this study.

2.5 Imagery Preprocessing

The multispectral imagery was received from DigitalGlobe Foundation at the ortho-ready standard product level (DigitalGlobe, 2012). Several steps were required to prepare the imagery for depth estimation, water column correction, and image classification. First, the individual image tiles for each scene were merged using QGIS (Quantum GIS Development Team, 2011). The merged scenes were then clipped to the rectangular bounding box of the study area (Figure 1). To avoid the loss of any image data, the clipping coordinates were chosen as offsets (in 2 m multiples) from the image origin point so that the original image resolution was retained and no resampling of pixel values was required.

All subsequent preprocessing steps were scripted using the OpticalRS Python library (Kibele, 2015). Image DN pixel values were converted to top of atmosphere reflectance using the OpticalRS implementation of methods recommended by DigitalGlobe (Updike and Comp, 2010). Then land was masked out by thresholding the Near Infrared (NIR) bands and applying a morphological filter. Lyzenga’s sun glint removal algorithm (Lyzenga et al., 2006) adapted for use with WV2 imagery. Due to the time-delayed integration technique employed by the WV2 sensor array, the capture time of image bands 2, 3, 5, and 7 are offset from those of bands 1, 4, 6,

and 8 by up to 24 seconds. Lyzenga’s method relies on correlating NIR reflections from the water’s surface with visible band values so all the band values must be coincident. The OpticalRS implementation, splits the 8 WV2 bands in to 2 groups of four, applies Lyzenga’s method, and reintegrates the results into 6 glint corrected visible bands with the two NIR bands returned unaltered.

2.6 Depth Estimation

In preparation for depth estimation, the WV2 image was smoothed using a bilateral denoising algorithm (Tomasi and Manduchi, 1998) available via the scikit-image Python library (van der Walt et al., 2014). The lidar and BPS depths were first corrected to chart datum values and then adjusted to depth at image acquisition time (+ 2.1 m). The BPS data points depths could have been used to train the depth estimation classifier as has been previously done (Kibele, 2017). However, it has been demonstrated that KNN depth estimation accuracy can be increased with additional training data (Kibele and Shears, 2016), so the lidar data were used to train the KNN depth estimation algorithm instead. This left all 1165 BPS depths available for accuracy assessment of the estimated depths. An exhaustive explanation of these methods is available in Kibele and Shears (2016).

2.7 Water Column Correction

Water column correction was carried out using a method based on (Maritorena et al., 1994). Briefly stated, the reflectance of optically deep water (R_∞) and the diffuse attenuation coefficient (K) were estimated for each image band by using the Levenberg-Marquardt algorithm (Marquardt, 1963) by fitting the image reflectance values (R) to estimated depths (Z) using this relationship derived from Maritorena et al. (1994):

$$R_i = R_{\infty i} + (A_i^{toa} - R_{\infty i})e^{-K_i g Z} \quad (1)$$

The estimated parameters (R_∞ and K) were then used along with estimated depths (Z) to retrieve the bottom albedo as sensed at the top of the atmosphere (A^{toa}). This retrieved bottom albedo represents an estimate of what the image might look like if the water column were removed. All calculations were carried out using the OpticalRS Python library (Kibele, 2015). An exhaustive description of these methods can be found in Kibele (2017).

2.8 Image Classification

The classification of the water column corrected imagery into a thematic habitat map was conducted with the Semi-Automatic Classification Plugin (SCP) for QGIS (Congedo, 2016) using methods common in terrestrial habitat mapping (Congedo and Munafò, 2012). Prior to classification, the image was smoothed by averaging spectral values in each band within a radius of 2 m or each pixel. This helps to compensate for the increase in spectral variability that is a byproduct of water column correction (Kibele, 2017).

Regions of interest (ROIs) were created near BPS ground truth points of known habitat. These ROIs were used to generate spectral signatures representative of each habitat. After tuning spectral signature thresholds and algorithm band weights by trial and error, the maximum likelihood algorithm was used to generate the classifications for the entire image. Throughout the tuning process, results were visually compared to the BPS ground truth points.

2.9 Accuracy Assessment

The previously described BPS ground truth data were used to assess the accuracy of the habitat map. All accuracy assessment calculations were carried out using the GroundTruthShp module of the OpticalRS Python library. To account for positional error a 3 m radius was used in the accuracy assessment. A given ground truth point was counted as a successful classification result if the ground truth habitat is found within a 3 m radius on the habitat map. The 3 m radius, on a habitat map with 2 m resolution, includes a minimum of 11 pixels up to a maximum of 16 pixels (44 to 64 m^2) depending on the exact location on the point within the grid of pixels. If the ground truth habitat is not found within this area, the most common habitat in the area is reported in the error matrix instead. Accuracy assessment was conducted for the full study area and then conducted again for separate regions of the study area to assess the impact of apparent variations in water quality on mapping accuracy.

3 Results

3.1 Ground Truth Data

Field data collection and processing resulted in a shapefile containing a total of 1165 points attributed with depth, bottom cover proportions, dominant bottom cover, and paths to benthic photos (Figure 3). After quantification of bottom cover and habitat classification according to Table 3, there were 217 Sediment points, 180 RTB points, 310 Ecklonia points, and 111 Mixed Weed points.

In addition to its role as ground truth data for the production of a habitat map, this ground truth shapefile is useful in and of itself as a record of bottom types. Using QGIS (or similar desktop GIS software), one can simply click on a data point and view the corresponding benthic photo. This can allow a quantitative assessment of differences in the extent and depth distribution of habitats across the study area and serve as baseline data for future studies.

3.2 Bathymetry

The estimated bathymetry for the study area is shown in Figure 4. When compared to the BPS depths gathered for ground truth, the root mean square error (RMSE) of the estimate was found to be 1.61 m. Visual comparison with the available lidar derived bathymetry suggests better accuracy in shallower (less than approx. 12 m depth) areas, and this was borne out in the comparison to BPS depths (Figure 4, inset).

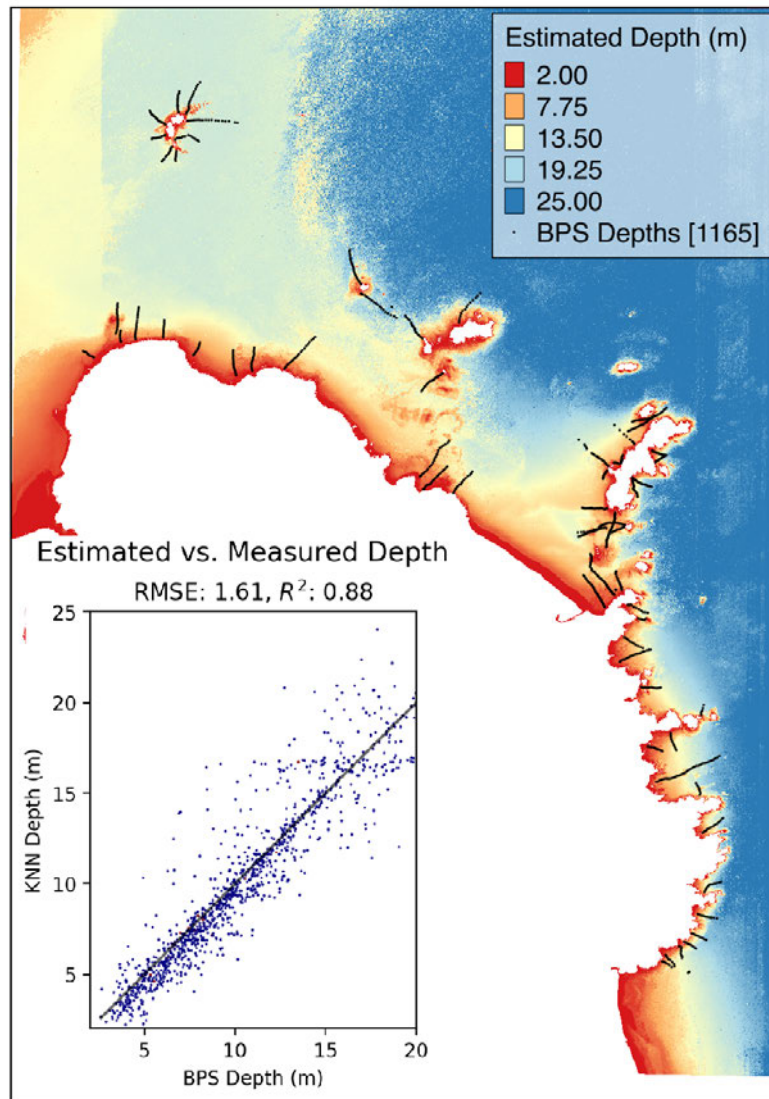


Figure 4: Bathymetry of the study area as estimated from WV2 imagery using the KNN method (Kibele and Shears, 2016). The inset shows estimated depths vs ground truth depths for the 1165 Benthic Photo Survey (BPS) points.

3.3 Habitat Map

The map of the 4 broad-scale habitat types (Table 1) within the study area is shown in Figure 5, and the regions used for accuracy assessment and summary statistics are outlined in black. The eastern boundary of the reserve was chosen as the demarcation between the Reserve and Eastern assessment regions because it is relevant from an ecological perspective as well as a reserve monitoring standpoint. Due to a sediment plume emanating from Whitianga Estuary and flowing out of Cooks Bay past Centre Island, this area was treated as a separate region in the classification analysis. In this way, the mapping accuracy in this region of reduced water clarity could be assessed separately from the rest of the study area, and

erroneous results could be excluded when comparing the reserve habitat distribution to the eastern non-reserve habitat distribution.

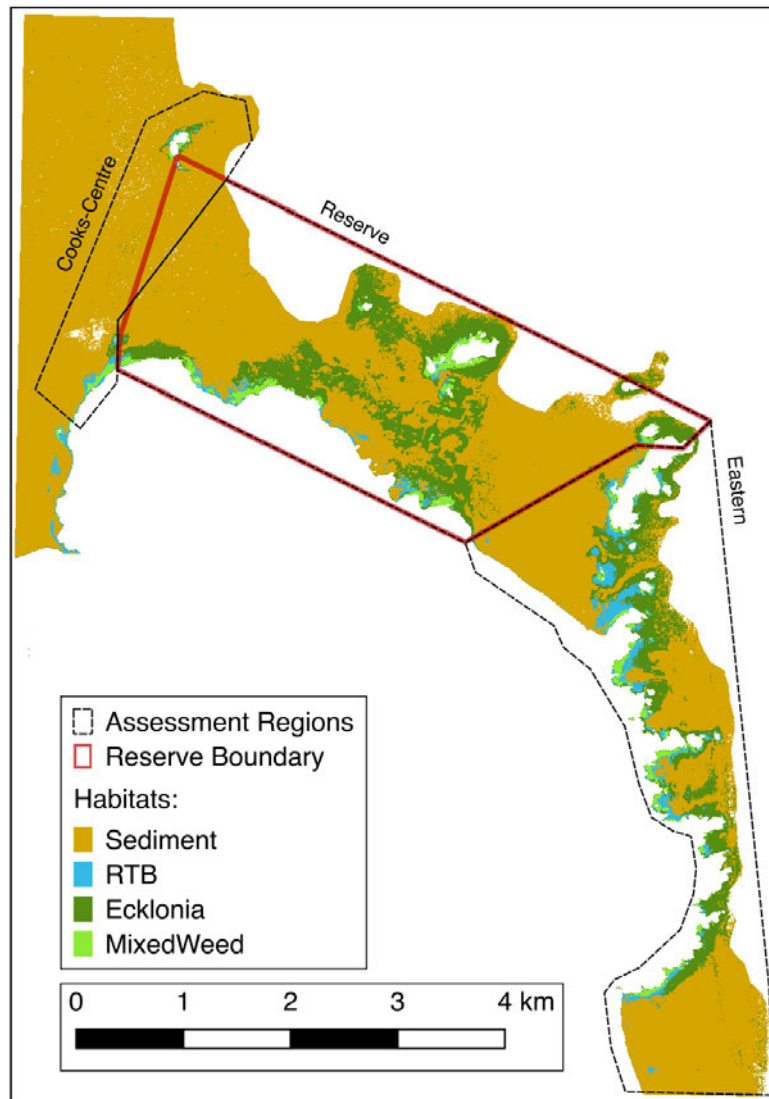


Figure 5: The habitat map showing distribution of 4 broad scale habitat types in and around the Whanganui-A-Hei Marine Reserve out to approximately 20 m depth. The reserve boundary is shown in red, and the assessment regions used for accuracy assessment are outlined in black dashed lines.

Areas were calculated for each habitat type within the Reserve and Eastern assessment regions (Table 4), and total reef area was calculated as the sum of the RTB, Ecklonia, and Mixed Weed habitat areas. Sediment was found to occupy the largest area in both the Reserve and Eastern regions (435.82 ha and 348.86 ha, respectively). A much larger area of RTB (29.42 ha) was found in the Eastern region than in the Reserve region (9.27 ha).

Percentages of reef cover were calculated for the 3 reef habitat types (RTB,

Table 4: Mapped habitat areas (*ha*) for the Reserve and Eastern assessment regions. Reef totals are the sums of RTB, Ecklonia, and Mixed Weed habitat areas.

	Sediment	RTB	Ecklonia	Mixed Weed	Reef Total
Reserve	435.82	9.27	149.78	17.44	176.49
Eastern	348.86	29.42	101.99	15.45	146.86

Table 5: Reef habitats as percentage cover of reef in the Reserve and Eastern assessment regions.

	RTB	Ecklonia	Mixed Weed
Reserve	5%	85%	10%
Eastern	20%	69%	11%

Ecklonia, and Mixed Weed) in the Reserve and Eastern regions by dividing the area of each reef habitat by the total reef area (Table 5). Mixed Weed was found to occupy nearly the same percentage of reef area in both regions (10% in Reserve vs. 11% in Eastern). However, the RTB and Ecklonia percentages of cover were markedly different. The RTB habitat was less prevalent within the reserve (5% in Reserve vs. 20% in Eastern) while, conversely, the Ecklonia habitat category was more prevalent within the reserve (85% in Reserve vs. 69% in Eastern).

3.4 Accuracy Assessment

As is common practice in habitat remote sensing studies (Congalton and Green, 2008), accuracy assessment metrics are reported in an error matrix with reference data (i.e., ground truth) in columns and mapped data in rows. User’s accuracy (the percentage of mapped pixels of a given class proven correct by ground truth), producer’s accuracy (the percentage of ground truth points of a given class that were classified correctly in the map), and overall accuracy (percentage of all ground truth points with successful classification) are also reported.

Accuracy assessment metrics for the entire study area are shown in Table 6. An overall accuracy of 73% was found for the 817 ground truth points examined. Producer’s accuracy for Mixed Weed was low (35%), with frequent misclassification as Ecklonia and slightly less frequent misclassification as RTB.

Accuracy assessment metrics for each region of the study area (Figure 5) are displayed in Table 7. The overall accuracies of the Reserve and Eastern regions (75% and 78%, respectively) are much better than the overall accuracy of the Cooks-Centre region (42%). Across the 2 more accurately mapped regions (Reserve and Eastern), the Sediment and Ecklonia habitat classes were mapped with higher accuracy (both user’s and producer’s) than the RTB and Mixed Weed classes.

Table 6: Accuracy assessment error matrix for the entire study area. Ground truth habitat types are arranged in columns and mapped habitat types are arranged in rows.

	Ground Truth				Totals	User Acc.
	Sediment	RTB	Ecklonia	MixedWeed		
Sediment	193	10	39	3	245	79%
RTB	9	109	8	28	154	71%
Ecklonia	13	47	260	41	361	72%
MixedWeed	2	14	3	38	57	67%
Totals	217	180	310	110	817	-
Producer Acc.	89%	61%	84%	35%	-	73%

Table 7: Accuracy assessment error matrix for the assessment regions shown in Figure 5.

Reserve	Ground Truth				Totals	User Acc.
	Sediment	RTB	Ecklonia	MixedWeed		
Sediment	45	0	10	1	56	80%
RTB	1	2	4	2	9	22%
Ecklonia	4	2	98	20	124	79%
MixedWeed	0	10	1	22	33	67%
Totals	50	14	113	45	222	-
Producer Acc.	90%	14%	87%	49%	-	75%

Eastern	Ground Truth				Totals	User Acc.
	Sediment	RTB	Ecklonia	MixedWeed		
Sediment	119	1	1	1	122	98%
RTB	8	104	4	20	136	76%
Ecklonia	9	45	159	16	229	69%
MixedWeed	2	4	2	15	23	65%
Totals	138	154	166	52	510	-
Producer Acc.	86%	68%	96%	29%	-	78%

Cooks-Centre	Ground Truth				Totals	User Acc.
	Sediment	RTB	Ecklonia	MixedWeed		
Sediment	29	9	28	1	67	43%
RTB	0	3	0	6	9	33%
Ecklonia	0	0	3	5	8	38%
MixedWeed	0	0	0	1	1	100%
Totals	29	12	31	13	85	-
Producer Acc.	100%	25%	10%	8%	-	42%

4 Discussion

An inexpensive drop-camera system (Figure 2) was used, over 3 days of fieldwork, to create a ground truth data set (Figure 3) comprising 1165 geotagged photos attributed with depth, bottom cover proportions, and dominant bottom cover. A subset of 817 photos were also attributed with broad scale habitat type (Table 1). Previously obtained lidar data were used to estimate depth throughout the study area (Figure 4), and this estimated bathymetry was used to produce a water column corrected WV2 multispectral image. The resulting image was classified to produce a habitat map of the study area (Figure 5), and mapping accuracy was assessed relative to the ground truth data set (Tables 6 and 7). The Reserve and Eastern assessment regions (Figure 5) were compared in terms of percent of reef coverage for 3 habitats (Table 5). Percent cover of Mixed Weed was consistent inside and outside the marine reserve (1% difference, Table 5), but the relative proportions of RTB and *Ecklonia* were markedly different. RTB represented 20% of the reef mapped outside the reserve in the Eastern region, but only 5% of the reef mapped in the Reserve region (Table 5). *Ecklonia*, conversely, represented a correspondingly larger proportion of reef in the Reserve region (85%) than in the Eastern region (69%) outside of the reserve (Table 5). This observation is consistent with previous findings that long-term protection from fishing can allow *Ecklonia radiata* kelp forests to spread into areas previously kept barren by an abundance of sea urchins (Shears and Babcock, 2003), and suggests that the Whanganui A Hei Marine Reserve is achieving the goal of ecosystem restoration and preservation.

It is notoriously difficult to compare the accuracy of habitat maps produced in different environments by different methods (Congalton and Green, 2008; Teixeira et al., 2016; Pontius and Millones, 2011), but studies utilizing optical remote sensing of submerged vegetation in coastal waters often report overall accuracies in the 70% - 90% range (Hoang et al., 2015; Sagawa et al., 2010; Reshitnyk et al., 2014; Uhl et al., 2016; Schweizer et al., 2005). The most directly comparable study, using the same habitat categories and nearly identical methods in New Zealand's Hauraki Gulf, reported an overall accuracy of 83% (Kibele, 2017). With a study area wide overall accuracy of 73% and regional overall accuracies of 75% and 78% in the Reserve and Eastern assessment regions, the present study is within the range of expected accuracy but lower than the 83% of the most directly comparable study. This reduction in accuracy is likely attributable to differences in the topography of the coastline and differences in the quality of the available WV2 imagery.

The steep coastline with numerous high cliffs combined with the low solar elevation (33.2°) of the imagery used in the present study resulted in shadows extending over the water on south facing portions of the coastline. Initial attempts to mask these shadowed areas proved problematic, so they were included despite the classification difficulties caused by the reduced solar irradiance. The steepness of the coast also made it difficult to get the boat into the shallowest areas to collect ground-truth points. These issues had an especially large deleterious effect on the accuracy of the Mixed Weed and RTB habitat categories that are associated with the shallowest near-shore waters (Shears et al., 2004). These habitat classes had the lowest user's and producer's accuracies in both the Reserve and Eastern assessment

regions (Table 7).

The RTB category within the Reserve area scored particularly poorly (14% producer's and 22% user's accuracy - Table 7). Of the 222 ground truth data points within the Reserve area, only 14 were confirmed as belonging to the RTB category. Of these 14 RTB points, 11 are concentrated in the northeastern corner of the Reserve area between Okorotere Island and Mahurangi Island. Four of the points are heavily shadowed by Okorotere Island and the remainder are on a shallow reef interspersed with bits of Mixed Weed. Of these 11 RTB points, 10 are misclassified as Mixed Weed. Given the scarcity of RTB ground truth points within the remainder of the Reserve assessment area, the misclassification of RTB in this one small (approx. 0.3 ha) area had a large impact on the accuracy of the RTB and Mixed Weed categories, and on the overall accuracy. The correct classification of this one area would bring the overall accuracy of the Reserve assessment area up to 84%.

The Mixed Weed category had poor producer's accuracy both within the Reserve (49%) and Eastern (29%) assessment areas. As with the RTB category, cliff shadows affected some of the shallow *Carpophyllum* forests (Shears et al., 2004) that make up this category (Table 1), but the inaccessibility of these areas may have had a larger impact. Due to the dangers inherent in driving a boat in very shallow water over rocky reef, particularly in the more wave exposed Eastern assessment region, the Mixed Weed ground truth points were not acquired from the low intertidal and very shallow subtidal depths where shallow *Carpophyllum* forests are extensive and homogenous. Instead, they were acquired from the deepest edges of the *Carpophyllum* forests and the Mixed Algae habitats (Shears et al., 2004) that tend to be patchy and transitional. With the spectral averaging employed as part of the image classification method, it is to be expected that accuracy in patchy areas will suffer, but the averaging was required to compensate for WCC induced image noise in deeper water. For future studies collection of ground-truth data could be collected from shallow water on snorkel using the BPS system (Kibele, 2016; Kibele, 2014).

Accuracy in the Cooks-Centre region was low enough (42% overall, Table 7) that habitat map for that region was deemed too unreliable for use in the calculation of habitat areas and reef cover percentages (Tables 4 and 5). The poor results in that region were likely due to decreased water clarity caused by outflow from the Whitianga and Purangi estuaries. WV2 imagery captured on an incoming, rather than outgoing, tide may provide better results but, as previously mentioned, the scene used was the best currently available in DigitalGlobe image catalog. It is clear that the methods used here are best suited to regions of open coast with high water clarity.

Despite the caveats discussed in relation to the accuracy of RTB and Mixed Weed in the Reserve and Eastern regions, it remains clear that RTB is much less common and Ecklonia is much more common in the reserve than outside of it (Table 5). This is evident, at least qualitatively, in the ground truth data independent of the WV2 image classification. Within the Reserve region, 8% of the reef ground truth points were RTB, 25% were Mixed Weed, and 66% were Ecklonia. In the Eastern region they were 41% RTB, 14% Mixed Weed, and 45% Ecklonia. These percentages can not be taken as representative of area proportions because sampling frequency

decreased with depth (because it was more difficult to haul the camera up and down and depth), and because extremely shallow areas were under sampled as previously discussed. The regional differences in Mixed Weed (25% vs 14%) are likely due to the increased wave exposure and correspondingly decreased safe sampling access to the shallows in the Eastern region (i.e., it wasn't safe to take the boat as shallow). However, the differences in RTB (8% vs 41%) and Ecklonia (66% vs 45%) reflect the same general pattern seen in Table 5. Ecklonia covers more reef and RTB covers less within the reserve, where fishing is prohibited, compared to the Eastern region where fishing is allowed.

It is likely, based on previous work (Shears and Babcock, 2003), that the urchin barrens component of the RTB category makes up the bulk of the observed difference in RTB cover inside and outside of the reserve, but due to the spectral similarity of rock, barrens, and turfing algae as well as their tendency to be interspersed, it is not currently possible to distinguish them using optical remote sensing methods. However, a careful reexamination of the ground truth drop camera ground truth data could offer more specificity. For example, within the reserve areas of urchin barrens were only common near to the reserve boundary (Centre Is and western side of Mahurangi Is) where predator numbers are likely to be reduced by fishing on the boundary. Additionally, an *Ostreopsis siamensis* bloom (Shears and Ross, 2009) was visible in many of the drop camera photos, and the Benthic Photo Survey software could be used to assess the depths and habitats effected and estimate the extent of the bloom. These topics are beyond the scope of this study, but they serve as examples of the flexibility of the Benthic Photo Survey ground truth method and as possible subjects of future research.

This study has demonstrated the potential of optical remote sensing methods in general, and of MORE-MAPS in particular, as a tool for mapping broad-scale subtidal habitats. Using fast and cost effective field methods, an extensive and flexible ground truth data set was created by 2 people over 3 days of boat work with no diving required. Free and open source software was employed to scale these field data up into a spatially explicit map of habitat distribution accompanied by quantitative measures of mapping accuracy. The overall accuracy of the resulting map differed among the three regions examined being lowest (42%) in the more turbid Cooks-Centre Is area, but reasonable (75% and 78%) in the other two areas with better water clarity. The map also allowed assessment of differences in the distribution of habitats inside and outside the Whanganui-A-Hei Marine Reserve, which revealed differences consistent with expectations based on the effects of fishing on subtidal reefs in the region. The habitat map and ground-truth data collected provide a valuable baseline to detect large-scale changes in habitat distribution along this coast in the future. Furthermore, the methods illustrated here could be applied as an efficient and cost effective tool for monitoring and mapping broad-scale reef habitats elsewhere in New Zealand.

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