EB.0364

BEFORE THE ENVIRONMENT COURT
AT AUCKLAND
I MUA I TE KŌTI TAIAO O AOTEAROA
TĀMAKI MAKAURAU ROHE

UNDER	the Resource Management Act 1991
IN THE MATTER	of appeals under Clause 14 of Schedule 1 of the Act
BETWEEN	**BAY OF ISLANDS MARITIME PARK INCORPORATED**
	(ENV-2019-AKL-000117)
	ROYAL FOREST AND BIRD PROTECTION SOCIETY OF NEW ZEALAND INCORPORATED
	(ENV-2019-AKL-000127)
	Appellants
AND	**NORTHLAND REGIONAL COUNCIL**
	Respondent

STATEMENT OF EVIDENCE of MARK ANDREW MORRISON (MARINE ECOLOGY)

TOPIC 14 – MARINE PROTECTED AREAS

19 March 2021

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INTRODUCTION

1. My name is Mark Andrew Morrison. I am a marine fisheries ecologist employed by the National Institute of Water and Atmospheric Research Limited ("NIWA"). I am providing this evidence on behalf of the Royal Forest and Bird Protection Society of New Zealand Inc ("Forest & Bird"), Bay of Islands Maritime Park Inc ("BOIMP") and Ngāti Kuta Hapū ki te Rawhiti ("Ngāti Kuta").

2. My evidence will cover the soft sediment seafloor ecology values of Area B (Ipipiri Benthic Protection Area).

SUMMARY OF EVIDENCE

3. In my evidence, I will summarise the known key ecological habits of the area of interest, focussing on subtidal seagrass meadows, maerl/rhodolith beds, horse mussel and other bivalve beds, and soft sediment macroalgal meadows. I will outline their ecological roles, and the impact that mechanical fishing methods have on them. I recommend that bulk fishing methods be banned from Area B, and in particular scallop dredging.

QUALIFICATIONS AND EXPERIENCE

4. I have a BSc (1988), MSc 1st Class Hons. (1990), and PhD (1999) degrees from the University of Auckland. My Master's thesis was on the ecology of parore, a shallow water herbivorous fish common on northeastern rocky reefs; while my PhD thesis was on the ecology and potential commercial enhancement of scallop populations in the Hauraki Gulf. Post PhD, I have completed individual university papers on statistical modelling, and Geographic Information Systems (GIS).

5. I joined the National Institute of Water and Atmospheric Research Ltd (NIWA) in 1996, as a marine fisheries ecologist, and have worked as a research scientist there since. During my PhD, I also did consulting work for the Coromandel Scallop Fisherman's Association (CSFA), quantifying the incidental effects of scallop dredging (on scallops encountered by dredges but not caught), and in the setting of scallop spat catchers arrays to assess spat collection potentials in the eastern Hauraki Gulf and western Bay of Plenty.

6. At NIWA, I have led, and/or been a team member in many projects, that cover a broad work spectrum of inshore (0 to 200+ m water depth) finfish and shellfish fisheries, and estuarine and coastal ecology, around New Zealand, with a particular focus on northern New Zealand. Clients have included MPI/FNZ, DOC, Regional Councils, MBIE, MfE, NZTA, aquaculture companies, Foundation North GIFT Fund, the Hauraki Gulf Sea Change Working Groups (Fisheries, Biodiversity), and LINZ.

7. I currently run a MBIE Research Programme on juvenile fish and their habitats, focused on juvenile snapper (East Northland and the greater Hauraki Gulf), and juvenile blue cod and tarakihi (focussed on the greater Marlborough Sounds area). Other current work streams include multibeam sonar mapping of key areas of the Hauraki Gulf, a review of marine restoration potential for the Hauraki Gulf, and a review of New Zealand's deeper water (30–200 m) rocky reef systems ecology and biology.

8. I have written a number of national scale literature reviews for MPI on marine fisheries ecology themes, including: impacts of land-based stressor on coastal fisheries and their supporting biodiversity; the role of biogenic habitats in supporting New Zealand fisheries; the life-history of key coastal fisheries species, and the Kaipara Harbour as an area of special significance to fisheries management

9. In addition to the present MBIE Research Programme that includes juvenile fish (0+ snapper less than 100 mm long, less than 1 year of age) and habitat work across the Bay of Islands, other work relevant to the Bay of Islands regions has included:

    a. Science lead for the Bay of Islands Oceans 2020 programme, which covered a range of science disciplines and investigations of both the Bay of Islands proper, and the wider East Northland Coast (50–200 m water depth).

    b. Science lead for fisheries project on the incidental impacts of recreational scallop dredging (conducted in the Kawau Bay area).

    c. Led MPI beam trawl survey to estimate 0+ snapper recruitment in East Northland and the Hauraki Gulf (including the Bay of Islands which holds significant snapper nurseries).

    d. Completed a comprehensive review of the natural marine features and values of Whangarei Harbour, and then for Northland (north coasts) for DOC (2 separate projects with associated reports).

    e. Lead a large Biodiversity Fund programme to document the location and values of biogenic (living) habitats on New Zealand's continental shelf (New Zealand Biodiversity Fund/MBIE/LINZ/NIWA Vessel Fund funded), including the East Northland shelf.

    f. Sampling and describing the juvenile/small fish assemblages and their habitat associations in estuaries around New Zealand, including sampling of the Bay of Islands. This also was expanded to coastal embayments, including the Te Rawhiti area (FRST/MBIE programmes).

g. National scale New Zealand Biodiversity Fund programme on the ecological values of seagrass meadows, including the Bay of Islands (south Urapukapuka Island subtidal seagrass).

h. Lead field sampling of juvenile and adult grey mullet, to look at their life history, including nurseries, large scale ontogenetic movements, and population structure (genetics).

i. Work on the status and characterisation of blue mackerel fisheries, which included the use of purse seine catch/effort data, and aerial sighting data as gathered by spotter planes (which record species identity and estimate tonnage of pelagic fish's surface schools).

j. I have spent time in the field in the Bay of Islands over the last 30 years for a number of research programmes and privately (diving, fishing), which collectively have included: juvenile/small fish sampling using hand-hauled beach seines, and a small beam trawl for subtidal waters (1–30 m water depth); research trawling (R.V. Kaharoa, centre of Bay and out on the shelf) and towed camera work (OS2020 programme); seafloor grab sampling for invertebrates; scallop abundance surveys using circular searches on SCUBA; diver-based sponge collections for bioactive chemistry research; boat-based interviews of recreational fishers; and personal diving for the gathering of crayfish and scallops, and scenic underwater experiences.

CODE OF CONDUCT

10. I have read the Code of Conduct for Expert Witnesses in Part 7 of the Environment Court's Practice Note 2014. I agree to comply with the Code of Conduct. In particular, except where I state that I am relying upon the evidence of another person as the basis for any opinion I have formed, the evidence in this statement is my expert opinion within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

EVIDENCE

11. East Northland holds a rich and biodiverse range of marine habitats and environments, that are still in relatively good condition compared to other regions of New Zealand. The coastline is indented with many estuaries, and contains many nearshore islands, along with large coastal embayments such as Doubtless Bay and the Bay of Islands. This diversity of environments, with a wide range of sea exposure gradients (from largely enclosed, through to open surf beaches and exposed rocky coastlines) and associated seafloor types, as well as the influence of the warmer water East Australian Current, make it a high biodiversity region. Of note on the continental shelf are the

large broad expanses of subtidal rocky reef that occur, which are much more extensive than those in most other coastal areas of New Zealand.

12. The Bay of Islands holds a large proportion of the coast's biodiversity, including biogenic (living) habitats that provide a range of goods and services both for nature, and for human society. While human activities on both the land and in the sea have degraded New Zealand's marine environments, the Bay of Islands still maintains high quality ecological values, particularly on its eastern side, including the Te Rawhiti Strait (Area B) and associated island region. This can be attributed to the chain of islands (as well as Cape Wiwiki and Cape Brett) proving protection from the open ocean, clear water over coarser soft sediments in shallow water allowing marine plant assemblages to flourish, higher current speeds that are affected by the islands and local headlands, its proximity to deeper open water habitats, and its relative distance from large riverine inputs of freshwater, suspended sediments, and nutrient run-off from the land.

13. Proposed Area B (Ipipiri Benthic Protection Area) encompasses Te Rawhiti Strait and adjacent islands and coastal bays. This is a biodiverse area, particularly notable for its biogenic habitats, including the dominance of much of the relatively shallow north-eastern soft sediment areas by marine macroalgae. This is relatively unusual. Subtidal seagrass meadows, a rare marine habitat in New Zealand that has been greatly reduced in its extent historically, occur through a number of its bays, especially on the southern sides of the islands (Figure 1). Particular habitats and their values are covered in paragraphs 14 - 26.

Subtidal seagrass

14. New Zealand has only one species of seagrass, *Zostera muelleri*, which is largely an intertidal plant, but which can grow subtidally where the water is sufficiently clear. Subtidal seagrass, now nationally rare, provides a wide range of values, including as nursery habitat for fish and invertebrates, elevating biodiversity values (many species live in, under, or on it) providing primary production, storing carbon, and as a foraging habitat for fish and birds (e.g., Turner & Schwarz 2004, 2006, Morrison et al 2014). Area B has 20 seagrass beds, mostly subtidal (**Figure 1**).

15. This is quite unique relative to other coastal island regions, both in terms of multiple beds occurring close to each other, and their combined spatial extent. Subtidal seagrass beds in northeastern New Zealand provide high value nursery habitats for fish, notably young-of-the-year snapper; having by-far the highest juvenile fish densities of any coastal habitat type (**Figure 2**) and providing significantly faster juvenile snapper growth rates relative to alternative nursery habitats (Stewart 2018). Higher survivorship of juvenile snapper is also thought to be provided by subtidal seagrass, and combined

with high fish densities and faster growth, means that these habitat type produce disproportionately much higher numbers of recruits to join the adult snapper population/s (and support higher sustainable fisheries yields. Other species also benefiting include juvenile parore, trevally, piper, leatherjacket; and several pipefish species (including the longsnout /smooth pipefish (*Stigmatopora macropterygia*) and black pipefish (*Stigmatopora nigra*). These two pipefish species are listed as 'Data deficient' in the New Zealand Threat Classification System lists (Hitchmough et al 2007.)

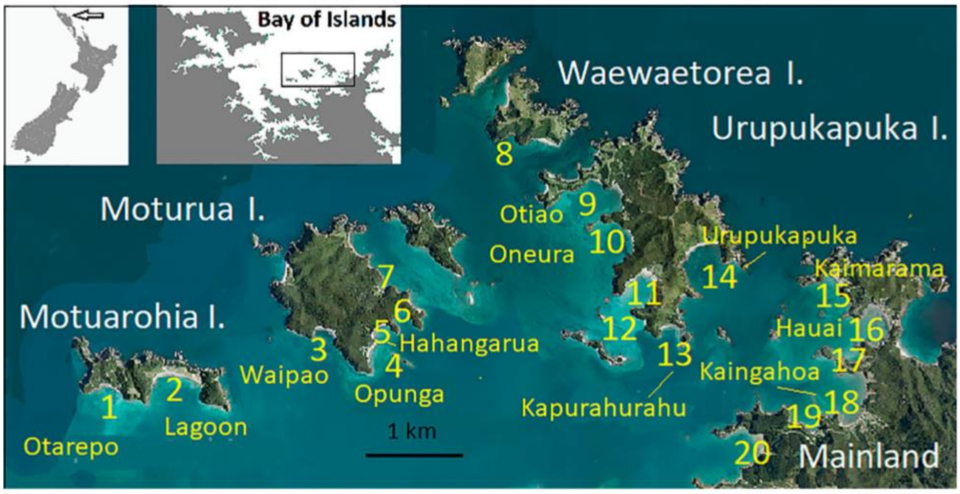

Figure 1 Seagrass beds of the islands and adjacent mainland shores in eastern Bay of Islands (from Booth 2019)

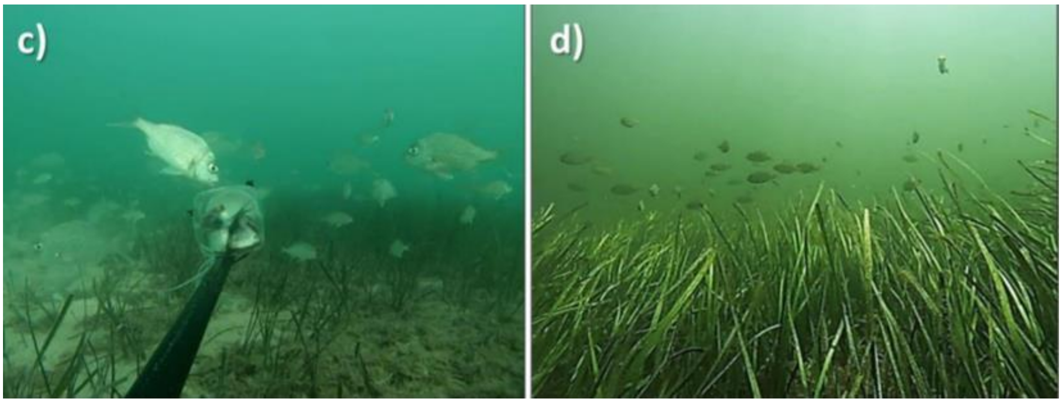

Figure 2 Juvenile snapper associated with subtidal seagrass meadows in East Northland, including c) in the eastern Bay of Islands, and d) in Rangaunu Harbour, north of the Bay of Islands.

Soft sediment macroalgal meadows

16. Soft sediment macroalgal meadows (range of species) are unusually common and abundant in Area B as compared to other areas of the Bay of Islands, as well as more regionally and nationally (Hewitt et al. 2010). They provide a similar range of ecological goods and services as subtidal seagrass, though they do not support (at least directly) important juvenile fish populations. As well as a range of red macroalgae species, the green alga *Caulerpa flexis* is common, forming large seafloor beds that extend out through lateral stolon

growth. These beds bind the sediment and provide three-dimensional habitat to many other species.

Rhodolith/maerl beds

17. Rhodolith/maerl beds are free-living coralline algae that form calcareous nodules, which occur as drifts or beds on the seafloor surface. They are long-lived and slow-growing and can form dominant biogenic habitats. They are usually biodiversity hotspots, with the interstices between them holding a diverse range of invertebrate species (e.g. Dewas & O'Shea 2011), and their hard surfaces providing stable attachment for algae. In some situations, dense beds of live dog cockles can occur under them, at about 10 cm depth. Overseas, they can provide important nursery habitats for juvenile fish and juvenile scallops, but no such close associations have been found in New Zealand. Nelson et al (2010, 2012) identified two species in the Bay of Islands, *Lithothamnion crispatum* (previously *L. indicum*) and *Sporolithon durum*. Two beds have been studied in greater detail, at Kahuwera Bay and Te Miko Reef, and were found to have high associated biodiversity, including algal species new to Northland and to science (Neill et al. 2015). As a plant species that requires high light levels (as with seagrass) they are particularly susceptible to both direct smothering by fine sediments, and higher suspended sediment loads in the water column.

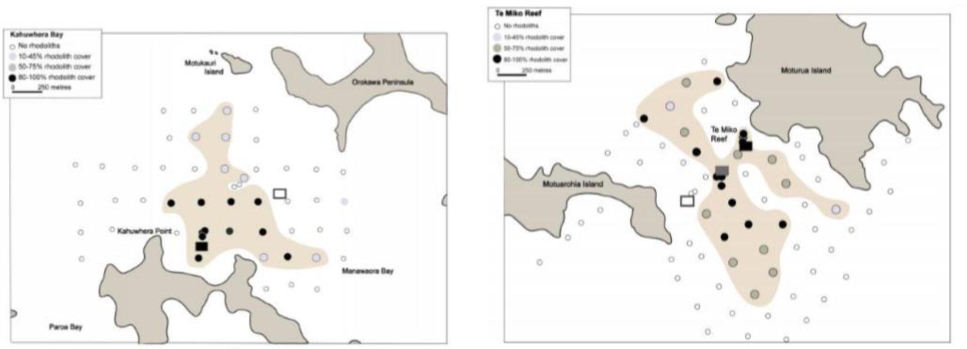

Figure 3 Distribution of rhodolith beds near Kahuwera Point and at Te Miko (from Nelson et al. 2012).

Bivalve (shellfish beds)

18. Horse mussels are large emergent shellfish that sit anchored upright on soft sediments, with the lower half/two-thirds of their shell buried. They range in densities from scattered individuals to very dense beds, and individuals are relatively long-lived (10–12 years or more, though poorly quantified). They provide a range of important ecological functions, including providing habitat for other animal and plant species, altering water flow near the seafloor, and bentho-pelagic coupling (filter feeding on phytoplankton and then excreting to the seafloor). They provide important nursery habitats for juvenile fish including snapper (though at lower fish densities that subtidal

seagrass), trevally, blue cod, spotties and bastard red cod (juveniles and adults), and in some contexts can be heavily encrusted with a range of epifaunal species. This function can include supporting diverse 'sponge gardens' on seafloors that would otherwise be bare.

19. Horse mussels have been severely reduced by demersal mobile fishing gears (and targeted removals in earlier decades), as well as loss from high sedimentation rates from land catchments.

20. Area B still holds horse mussel populations (e.g. Figure 4), that appear to be in relatively good condition. For reasons that are unknown, horse mussel populations in the Hauraki Gulf are thought to be in decline by marine scientists knowledgeable on this species. East Northland is less well known re changes over time. In the LINZ OS2020 programme, research bottom trawling deliberately avoided sampling areas B, to avoid causing any damage to the horse mussel beds of Te Rawhiti Strait, which have been protected from commercial bottom fishing gears for decades.

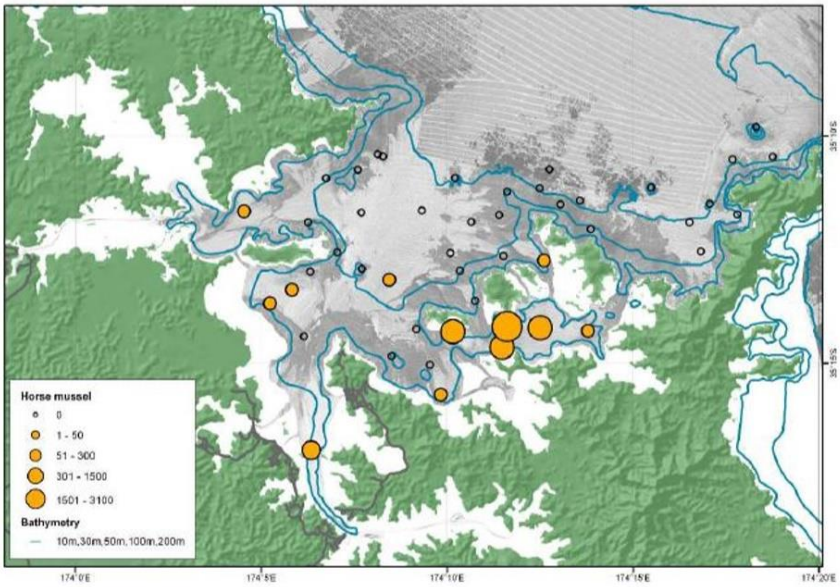

Figure 4 Horse mussel distribution and abundance as seen by towed video in 2009, and a horse mussel bed at 12 m water depth, Te Rawhiti Strait ((Bowden et al, 2010, OS2020 programme)

21. Scallops are common in the Bay of Islands, with the main beds being:

    a. Albert Channel between Urupukapuka Island and the Rawhiti mainland (including Urupukapuka Bay);

    b. the area between Paramena Reef, Poroporo Island and Ngatokaparangi Islands/reefs to the south of Motukiekie; and

    c. Motukiekie Channel between Urupukapuka and Motukiekie Islands (Pacific Eco-logic Ltd. 2016).

22. Numbers have declined from historical times, and the East Northland scallop fishery/population more widely is currently at a very low level. Commercial scallop dredging is prohibited in Area B, with most of the scallop harvest being taken recreationally, by diving and the use of recreational dredging.

23. When larval scallops first settle from their planktonic phase, they require foliose surfaces such as hydroids and red algae to settle onto and attach themselves with byssus threads. Such biogenic habitat surfaces are impacted by bottom trawling and dredging fishing gears – this includes recreational scallop dredges. Scallops are also a species that has density-dependent spawning success – as effectively a sedentary species that broadcast spawn eggs and sperm up into the water column, where fertilisation occurs. Dense scallop aggregations (beds) generate better overall reproductive success, as the encounter rates of sperm and eggs are much higher. Scallops occurring as occasional solitary individuals may in fact be reproductively irrelevant at the population scale.

24. Scallop harvesting, both commercial and recreational, preferentially targets the densest beds, moving to less productive areas as the beds are diminished.

While some beds are protected from commercial fishing by obstacles such as adjacent subtidal reefs and the presence of marine cables, as well as ceasing fishing once scallop densities fall below those required to stay in profit; beds fished recreationally are not. As technology (e.g. GPS to re-locate beds) and human populations increase, the probability of some dense beds surviving to act disproportionately as brood stock sources that provide new recruits to other more fished beds greatly declines. Ultimately, no reliable ongoing supply of new recruits means that all the scallop beds in an area will 'crash' and cease to exist as beds (along with their ecological functions). These ecological functions include providing food for fish, starfish and other animals; bentho-pelagic coupling; and the accumulation of dead shell as both solitary shells and shell drift, providing three-dimensional habitat for many other species, both mobile and attached.

25. Other bivalve species also occur as dense beds in Area B, including the large and heavy shelled dog cockle *Tucetona laticostata*. Occurring as beds in high current areas, as well as providing bentho-pelagic coupling, the dead shells of this species can persistent for very long time periods (10s of thousands of years) and can form dense drifts that provide habitats for a range of other animal and plant species, and structure the nature of the seafloor (Dewas & O'Shea 2011, Morrison et al 2014). The much smaller and lighter shelled morning star shell *Tawera spissa* also occurs in Area B. This infaunal (lives in the sediment) species can form dense beds over large areas, dominating the seafloor. For example, sampling of a bed on Omaha Bay, adjacent to Leigh (outer western Hauraki Gulf) mapped the spatial extent of the bed as >1.5 km^2, with densities of up to 3500 m^{-2} or more, and up to 7.5 kg m^2 (Taylor & Morrison 2008).

26. More widely across the Bay of Islands, the LINZ OS2020 survey work used a towed camera array (DTIS) to sample both rocky reef and soft sediment sites for their epifaunal species assemblages (**Figure 5**). The highest species diversity was seen on rocky reef habitats in the deeper water areas, along with a general trend of increasing species diversity with depth. The abundance of habitat forming species is greater around the outer islands and associated reef edges of the Bay of Islands (**Figure 6**), with the central soft sediment area being composed of mud seafloor (**Figure 7**). This is probably due to the availability of harder surfaces (rocky reefs) to attach to, as well as avoidance of the softer mud habitats, which during resuspension events have adverse impacts on filter-feeding animals, and plants' ability to photosynthesise.

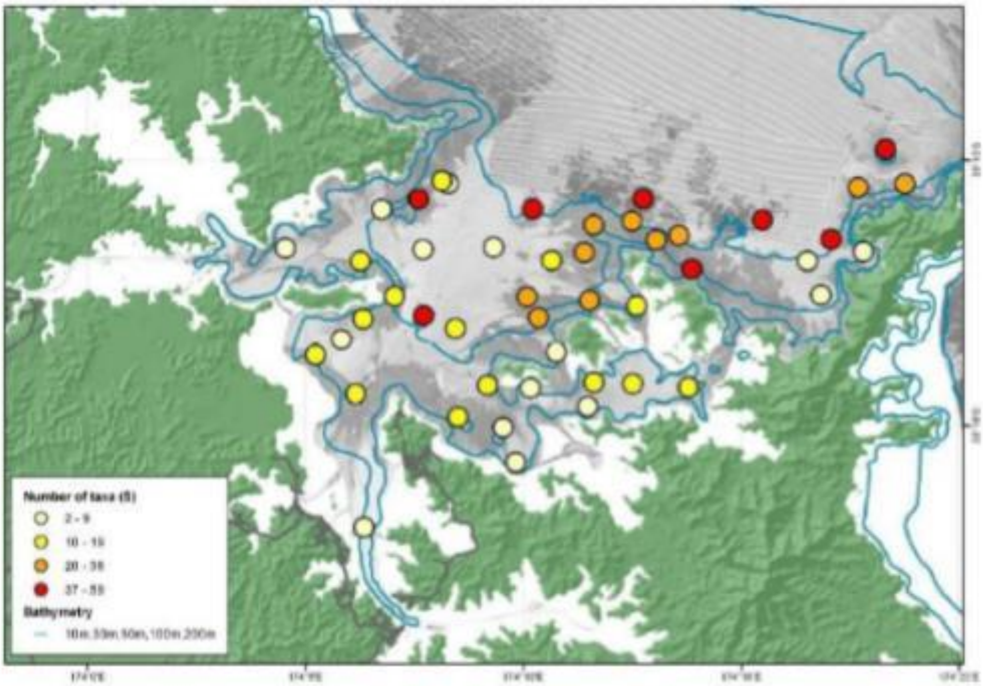

Figure 5 Species diversity (number of species seen) by towed camera at Bay of Islands sites (from Bowden et al. 2010).

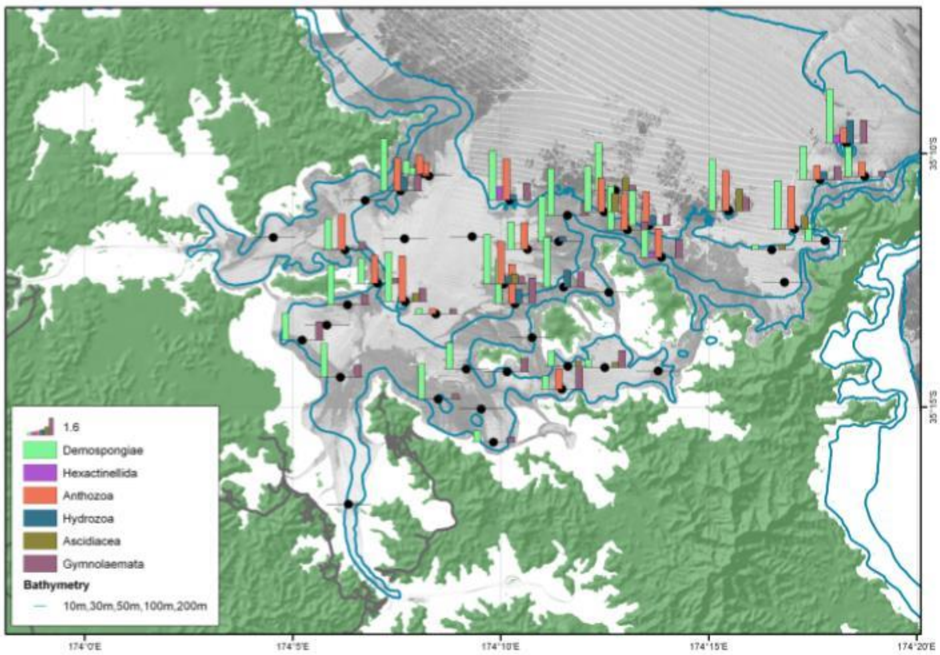

Figure 6 Sessile fauna classes recorded in DTIS (towed video) seabed imagery. Demospongiae and Hexactinellida are sponges; Anthozoa includes corals, anemones and sea pens; Ascidiacea are sea squirts; Gymnolaemata are bryozoans. Bars show the Log10 transformed abundances (log10 (1+x)) of each class; thus, if one bar is twice the height of another, it presents 10 times greater abundance) (figure 17 of Bowden et al. 2010).

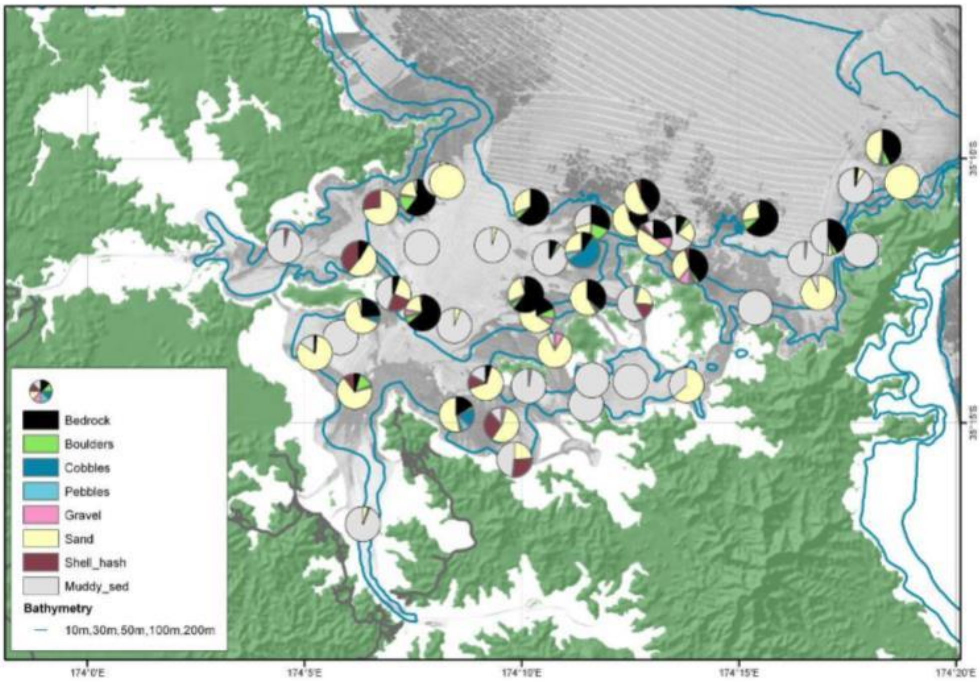

Figure 7 Seabed substrates recorded in DTIS video transects. Pie charts show the relative proportions of substrate types in each transect (charts are centred on the transect midpoint). Background greyscale image shows acoustic backscatter intensity from the EM3000 multibeam echosounder; darker areas indicate harder substrates and lighter, softer (figure 12 of Bowden et al 2010)

Ecological significance of Area B soft sediment ecosystems

27. The subtidal seagrass meadows, soft sediment macroalgal meadows, rhodolith beds, and bivalve beds of area B described in paragraphs 14 to 26 above meet the following criteria in the New Zealand Policy Statement:

    a. Policy 11a(iii): subtidal seagrass meadows and rhodolith/maerl beds are indigenous ecosystems and vegetation types that are threatened in the coastal environment or naturally rare.

    b. Policy 11a(v): subtidal seagrass meadows and soft sediment macroalgal meadows are nationally significant examples of indigenous community types.

    c. Policy 11b(ii) subtidal seagrass meadows and horse mussel beds are habitats in the coastal environment that are important during the vulnerable life stages of indigenous species.

    d. Policy 11b(iii) subtidal seagrass meadows, bivalve shellfish beds (see species above), and rhodolith/maerl beds are indigenous ecosystems and habitats that are only found in the coastal environment and are particularly vulnerable to modification.

28. Those features also meet the following criteria in Northland Regional Policy Statement Appendix 5:

    a. 1. Representativeness Criteria a(i–iii): subtidal seagrass meadows, horse mussel and other bivalve beds, rhodolith/maerl, and soft sediment macroalgal beds; the ecological site is largely indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity at the relevant and recognised ecological classification and scale to which the ecological site belongs.

    b. 2. Rarity / distinctiveness:

        i. Criterion a(ii): subtidal seagrass meadows are ecological site(s) comprising indigenous ecosystems or indigenous vegetation types that are now less than 20% of their original extent.

        ii. Criterion b: subtidal seagrass is indigenous vegetation and habitat of indigenous fauna that supports one or more indigenous taxa that are threatened, at risk, data deficient or uncommon, either nationally or at the relevant ecological scale, specifically the longsnout /smooth pipefish (*Stigmatopora macropterygia*) and black pipefish (*Stigmatopora nigra*), pipefish, which are listed as 'Data deficient' in the New Zealand Threat Classification System lists (Hitchmough et al 2007)

        iii. Criterion d(i): subtidal seagrass and soft sediment macroalgal beds are ecological site(s) contains indigenous vegetation or an association of indigenous taxa that is distinctive of a restricted occurrence.

    c. 3 Diversity and Pattern Criterion a(i): subtidal seagrass meadows, soft sediment macroalgal meadows, rhodolith beds, and bivalve beds collectively provide indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types.

    d. 4 Ecological Context Criterion c: subtidal seagrass and horse mussel beds are important habitats for critical life history stages of indigenous fauna including breeding / spawning, roosting, nesting, resting, feeding, moulting, refugia or migration staging point (as used seasonally, temporarily or permanently) – in this case as juvenile fish nurseries for snapper, trevally, parore, piper, leatherjacket, and pipefish species.

29. In relation to Northland Regional Plan Objective F.1.3, subtidal seagrass meadows, soft sediment macroalgal meadows, rhodolith beds, and bivalve

beds require protection as areas of significant indigenous vegetation and significant habitats of indigenous fauna, and their protection is also necessary for maintaining regional indigenous biodiversity.

Effects of mechanical bottom contact fishing methods on soft sediment ecosystems

30. Fishing using mechanical bottom contact methods such as trawling, Danish seining, and scallop dredging are now well known to impact on seafloor communities by:

    a. removing epifauna;

    b. altering sediment characteristics; and

    c. resuspending fine sediments where they are present.

31. This is in addition to the fish and shellfish that are being targeted for capture; with the unwanted component that is caught being known as bycatch. Many of the damaged/killed organisms are not actually caught in the fishing gears, passing under them with contact, or through the meshes of the nets/dredges. The impacts tend to be much greater for larger, more-long lived epifauna, which also may take very long timescales to recover, even if fishing is removed.

32. Positive feed-back mechanism/relationships between organisms can also be removed. For instance, as previously noted, setting scallop larvae require foliose surfaces to settle on, provided by other species such as red algae and hydroids, which in turn are often growing attached to dead adult scallop shells which provide hard stable attachment surfaces. Scallop dredging destroys these foliose surface organisms, as well as turning over/moving/removing and then throwing back dead scallop shells. It also re-suspends fine sediments, which are detrimental to both filter-seeding invertebrates and plants, both directly and indirectly (e.g. smothering hard surfaces required for larvae/spores to settle on and grow).

33. Recreational fishing dredges, while much smaller and lighter than commercial dredges, are nonetheless damaging to the seafloor. Towed with a rope behind vessels, their effects include:

    a. Flattening and dislodging species groups such as sponges, seaweeds, and hydroids; some of which are left lose and unattached on the sea floor (eventually to die), while others are retrieved in the dredge as bycatch and then thrown back into the sea (also to die).

    b. Species such as horse mussels are less likely to caught as bycatch, but with relatively thin and weak shells, can be cracked by the impact of the towed dredge, as well as being punctured or chipped by the forward-facing steel tines/teeth on the dredge. Once the integrity of the shell is impaired, they are very prone to predation, as well as being unable to protect their soft bodies from sediments and will die.

c. The passage of the dredge also disturbs the seafloor surface, through 'raking', with the tines including the turning over of sedimentary species such as rhodoliths, physical contact of the dredge body, and dislodgment/suspension by water suction vortices. This can include the resuspension of fine sediments. Heavily fished scallop beds often have low levels of epifaunal species, and where the bottom type can 'preserve' the dredge's footprint, raking can be seen of the seafloor from dredge tines (e.g. on rhodolith beds on Albert Shoal, Kawau Bay, pers. obser.)

34. Habitats vary in their sensitivity to fishing. For instance, hard packed sandy seabeds with little epifauna are likely to be more robust; whereas seafloor with high coverage of epifaunal organisms, including biogenic habitat formers, can be heavily degraded and modified with just a single pass of a fishing gear. For Area B, most of the seafloor is composed of either coarser seafloor sediments that support a range of biogenic habitats and epifaunal species, or muddy soft sediment seafloor often pock-marked with burrows (probably crabs/shrimps), where physical disturbance resuspends the fine sediments present.

35. In my opinion, mechanical bottom contact methods of fishing are having a significant adverse effect on the ecologically significant ecosystems and species described in my evidence.

Proposed Schedule

36. I have reviewed the draft Schedule of characteristics, qualities and values for the proposed Te Hā o Tangaroa Protection Area Rakaumangamanga-Ipipiri. I consider that it appropriately describes those characteristics, qualities and values.

Controls necessary to manage effects of fishing on soft sediment ecosystems

37. Area B is already protected from all forms of heavy mechanical commercial fishing (trawls, Danish seine and scallop dredging). However, recreational dredging is still permitted here and across Area C (and more broadly anywhere in the coastal zone, excluding areas such as cableways and marine reserves). As a method that damages both important biodiversity, and fisheries-supporting, seafloor areas, and for which a ready alternative method exists (collecting scallops by diving, and in some areas by snorkelling) – I recommend that this method cease to be permitted in the Bay of Islands (and ideally, across the wider East Northland region).

38. I note that the current Hauraki Gulf Sea Change proposals (currently being considered by MPI, DOC and Auckland/Waikato Regional Councils) also recommend the banning of recreational scallop dredging, using the same rationale.

39. I would also support establishing no-take scallop 'brood-stock reserves' in the Bay of Islands, allowing some dense scallops beds to avoid heavy harvesting pressure, and allowing them to produce much higher outputs of scallop larvae to recruit to the surrounding areas. Combined with the removal of recreational scallop dredging from the Bay of Islands, this would significantly increase the health of scallop populations and the habitat/species assemblages they contribute to.

Mark Morrison

19 March 2021

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