

Characterising the regulatory seascape in Aotearoa New Zealand: Bridging local, regional and national scales for marine ecosystem-based management

Stephen C. Ulrich^{*}, Faye R. White, Hamish G. Rennie

Department of Environmental Management, Lincoln University, Canterbury, New Zealand

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ABSTRACT

In the face of declining ocean health and marine biodiversity, marine management arrangements may need to change in many jurisdictions. This can occur in a planned process of legislative and institutional reform undertaken by central government, or by an incremental and *ad hoc* ‘unplanned’ process through court decisions or local actions. In either case, targeted characterisations of the contemporary regulatory seascape are necessary to accurately diagnose what system elements may need major change to address ecological degradation. In this study, we examine the regulatory and institutional interplay between central government, sub-national regional authorities, and Indigenous Māori in the protection and management of marine biogenic habitats in New Zealand. Based on an analysis of government documents, institutional responses to a set of questions, and recent case law, we found generic institutional failings to implement core legislation, at both sub-national ‘regional’ and national scales. In particular, less than half of the regional authorities had given effect to a mandatory national instrument that set environmental bottom-lines, and central government failure to identify and protect significant fisheries habitats. Concurrently, we identified an upsurge in requests for temporary fishing closures through rāhui (traditional customary prohibitions), and the potential for tools enabled in customary marine tenure legislation to play a significant future role in managing marine ecosystem health. Our study highlights that the regulatory seascape is devolving towards a greater polycentricity of management with an increased involvement of Māori at sub-national and local levels, which may hold lessons for Indigenous peoples in other jurisdictions. These ‘unplanned reforms’ are likely to be a key driver of improvements in the management and governance of biodiverse marine biogenic habitats at national and sub-national level, both prior to, and as a consequence of, the New Zealand Government’s planned ocean reform programme.

1. Introduction

A global challenge in addressing degradation of the marine commons is how to align management and governance where there are overlapping regulatory systems that operate at different scales (e.g., van Vliet and Dubbink, 1999; Folke et al., 2005; Eger et al., 2021). This challenge is exacerbated where there are tensions between centralised regimes and localised or Indigenous rights to marine resources (Diggon et al., 2019; Brennan, 2022). Failure to solve these issues can inhibit the implementation of existing laws and policies, or stall reforms where regulation and institutional arrangements are inadequate (Macpherson et al., 2021).

Any planned reform programme needs to address complex and interrelated socio-ecological issues at different scales (Folke et al., 2007). This is partly due to existing spatial and temporal misalignments

between institutions and ecosystems (Folke et al., 2007; Ekstrom and Young, 2009; Epstein et al., 2015). In addition, information gaps, inadequate resources, vested interests, organized crime, prevailing utilitarian attitudes to nature, organisational culture, and system inertia are powerful influences to overcome to bring about regulatory and behavioural reforms necessary to improve ocean health in many jurisdictions (Jones and Ganey, 2009; Curtin and Prellezo, 2010; Stanley et al., 2019; Witbooi et al., 2020; Yaffee, 2020). Appropriate checks and balances therefore need to be embedded within the regulatory redesign to prevent undue influence of vested interests and/or dysfunctional institutions, whose action or inaction can be detrimental to marine ecosystems (Diaz et al., 2019; Elrick-Barr and Smith, 2021).

Marine ecosystem-based management (MEBM) has been suggested as both a process and outcome of such reform, although there are also inherent difficulties in attempting to change myriad laws and policies

^{*} Corresponding author. PO Box 85 084 Lincoln University 7647, New Zealand.
 E-mail address: steve.urlich@lincoln.ac.nz (S.C. Ulrich).

(McLeod and Leslie, 2009; Wondolleck and Yaffee, 2017; Alexander and Haward, 2019). One of the challenges for MEBM is how to reconcile and integrate management within and between local, sub-national regional ('regional'), and national scales (Folke et al., 2007; McLeod and Leslie, 2009; Elrick-Barr and Smith, 2021). This is particularly fraught when polycentric governance of the marine environment is enabled at a regional scale within some legislation (e.g., for biodiversity protection), but retained as centralised at a national scale in other legislation (e.g., fisheries management) (Ulrich, 2020; Scott, 2021).

Macpherson et al. (2021) suggested that rather than solely aiming towards one system or policy, governments and citizens need to work with these existing fragmented regulatory regimes to make progress toward MEBM, until systemic reform can occur (see also Curtin and Prellezo, 2010; Wondolleck and Yaffee, 2017). This is because there may be practical management and legal changes that can be achieved in the short-term to assist in achieving MEBM (Stojanovic and Ballinger, 2008). Rather than waiting for agreement on overarching constitutional anchors to underpin MEBM, by identifying and implementing under-utilised mechanisms present in current legislation, it may be possible to facilitate MEBM through relationships built between people, communities, sectors, and government at multiple levels (McLeod and Leslie, 2009; Berkes, 2010; Scott, 2021; Macpherson et al., 2021).

The process of reform or devolution in marine management may also occur in an unplanned way in response to institutional failures (e.g., Busenberg, 2008; Stojanovic and Ballinger, 2008), or judicial decisions which reorient statutory responsibilities between institutions at different scales (e.g., Ulrich, 2020). In some jurisdictions, there are also societal shifts in the recognition of Indigenous rights and interests in the marine environment (Macpherson et al., 2021). As has been noted for marine spatial planning, partnering with local or Indigenous people to recognise their rights also requires providing enforceable regulatory support (Corral and de Lara, 2017; Diggon et al., 2019). MEBM may require polycentric management and governance arrangements to bridge and reconcile different scales and different interests that may have existing regulatory mechanisms (Ostrom, 1990; Folke et al., 2005; Berkes, 2010).

If it is indeed the case that there are significant management and practice changes that can improve the performance of the regulatory system within existing laws and policies (e.g., Gerrard, 2021), then it throws up a conundrum for how to most speedily and effectively achieve the goal of transformative ecological outcomes (Diaz et al., 2019). In undertaking the scoping for major regulatory reform, it is necessary to objectively determine if the existing system has been adequately designed (and resourced) to drive the necessary regulatory behaviours to manage environmental issues more effectively. If the system is enabling of MEBM, then the failure to implement it may reflect deliberative political and institutional choices to continue maladaptive ecological practices that sustain employment and economic activity (e.g., Randerson et al., 2020; Gerrard, 2021). The risk of reform without careful characterisation and analysis of the 'regulatory seascape', is that the same organisational cultures and behaviours can be transferred to newly created or renamed institutions, thereby stymieing and delaying the necessary changes needed to improve and sustain ocean health.

In doing such analysis, it is important to determine whether regulators already have adequate legal and policy levers to bring about necessary transformative change (Diaz et al., 2019; Elrick-Barr and Smith, 2021). In other words, is the system hard-wired for path dependency to over-exploit fisheries, cause physical damage to biogenic habitats, and enable excessive deposition of terrestrially-derived sediment from clear-fell extractive land uses, which are examples of multiple and cumulative stressors currently affecting the ocean (Thrush et al., 2001, 2004; Thrush and Dayton, 2002; Ulrich and Handley, 2020; Sala et al., 2021).

The characterisation of a regulatory seascape should also recognise that MEBM is an ongoing relational process between institutions and with their communities (Wondolleck and Yaffee, 2017; Macpherson

et al., 2021). This means that MEBM is place and context-specific (Hewitt et al., 2018), that, in being developed, occurs within its own social and cultural milieu. For example, in many jurisdictions, Indigenous people face difficulties having their rights in the coastal marine area recognised, thereby making MEBM challenging without resolution (Macpherson et al., 2021). The success of marine management reform is not only contingent on rights granted by historical treaties being fully recognised, but also on the recognition of, and support for, traditional ways of adaptively managing local environments (Berkes, 1999). For example, rāhui have been an important tool for Pacific cultures in regulating human activities on nature (Wheen and Ruru, 2011; Bambridge, 2016; Joseph et al., 2020). Rāhui are temporary customary prohibitions placed by Indigenous groups that hold authority over a resource or territory (Bambridge, 2016). In Aotearoa New Zealand (hereafter 'Aotearoa NZ'), placement of rāhui by Māori occurs over marine habitats to either: rebuild food stocks; manage pollution; or to acknowledge the dead (Maxwell and Penetito, 2007). Therefore, the application of local customary practices such as rāhui within the regulatory seascape needs to be considered as a contributory component of MEBM (Berkes, 2010; Taylor et al., 2018).

Aotearoa NZ features a devolved coastal management regime suggested as a model for other countries (Makgill and Rennie, 2012). It has received attention internationally for its national application and administration of a quota management system for commercial fisheries, despite social, equity, and biological sustainability concerns (McCormack, 2017; Hersoug, 2018). Less well known for its MEBM relevance is its rapidly evolving recognition of Indigenous rights and interests in the management of the marine environment. Recent court decisions have clarified the potential for some existing localised mechanisms to be applied in novel ways to integrate fisheries into local coastal management, and to resolve some territorial use rights for different Māori tribes (iwi). These events, alongside settlements for historic grievances under the 1840 Te Tiriti o Waitangi/Treaty of Waitangi ('Te Tiriti'), have effectively initiated the unplanned devolution of coastal and marine management. If fully implemented, the consequent 'forced' polycentricity of spatial management at different scales may lead to improved processes and outcomes (Ulrich et al., 2019; Ulrich, 2020), and in particular for local and/or Indigenous peoples to express control over areas important to them (Joseph et al., 2020). This is because existing management structures are required to adapt to these changes, and may be compelled to exercise functions not undertaken before and/or which they have not chosen to do (Gerrard, 2021). In the context of Aotearoa NZ's experience providing useful models for management of marine resources elsewhere, these developments in socio-ecological linking of distinctive management systems are significant. This may be relevant to Indigenous peoples in the process of decolonising the management of marine environments (Mutu and Jackson, 2016; Joseph et al., 2020; Mercier, 2020).

1.1. Study aims and objectives

This study aims to characterise the existing regulatory seascape in Aotearoa NZ, and examine how recent developments in law and policy are influencing management at different scales. Aotearoa NZ is in the early stages of planned regulatory reform in its management of marine environments and other ecosystems, as well as institutional arrangements at regional and local scales. These processes are also informed by, and accommodate, separate unplanned legal precedents and societal changes in response to an evolving bicultural co-governance. Here, we investigate some of these implications of unfolding novel polycentric arrangements.

We focus on the management of the nexus between biodiversity and fisheries under three pivotal pieces of marine legislation: the Resource Management Act (RMA) 1991, the Fisheries Act (FA) 1996, and the Marine and Coastal Area (Takutai Moana) Act (MCAA) 2011. We examine the regulatory and institutional interplay between central and

regional government in the identification, protection, and management of biogenic benthic habitats, in territorial coastal waters (within 12 nautical miles of land).

Biogenic habitats are fundamentally important to ecosystems as they create and sustain biodiversity at different scales (Thrush and Dayton, 2010). These are defined as encompassing: “a) those living species that form emergent three-dimensional structure, that separate areas in which it occurs from surrounding lower vertical dimension seafloor habitats and b) non-living structure generated by living organisms, such as infaunal tubes and burrows” (Morrison et al., 2014, p8). These habitats are in essence examples of the “ecological complexes” explicit within the 1992 Convention on Biological Diversity’s (CBD) definition of biological diversity, which Aotearoa NZ ratified in 1993 (Urlich et al., 2018). Such ecological complexes can be structured by organisms with emergent calcite exoskeletons that are often vulnerable to physical disturbance, yet in dense aggregations host a diversity of marine plant and animal species, undertake critical ecological functions, and stabilise seafloor sediments (Thrush and Dayton, 2002). The stability they provide for coastal and shelf sea sediments is also important for carbon sequestration (Luisetti et al., 2019; Sala et al., 2021).

In addition to examining the regulatory relationships of central and local government, we also examine the regulatory role of Indigenous Māori with respect to rāhui, dispersed throughout the country as iwi and related hapū (sub-tribes). These tribal areas are often smaller than, and nested within, a regional scale. How iwi and hapū interact with regulators operating at larger scales is important to MEBM development, as Māori have constitutional rights and interests as partners to Te Tiriti, which are recognised in various ways in law. Lessons that emerge from our study may assist other jurisdictions to help address sectoral interplay (Alexander and Haward, 2019), and to enhance or restore relational MEBM processes between institutions and Indigenous peoples to bring about needed transformative changes to ocean management.

Our study therefore seeks to characterise the regulatory seascape in Aotearoa NZ through three interrelated parts:

- (1) Examining how central and regional government have responded to a recent court decision on the interaction between the FA and RMA for managing biogenic habitats;
- (2) Investigating the regulation of marine activities on these habitats at different scales, including the use of rāhui exercised by Māori at a local scale;
- (3) Suggesting how the regulatory seascape could evolve to manage biogenic habitats more effectively, as Māori customary interests begin to be formally recognised under the MCAA.

1.2. Aotearoa New Zealand as a case study

Aotearoa NZ is a relevant place to explore the devolution of institutional power and evolution of novel polycentric governance at interacting scales. It has a democratically-elected government, stable institutions, a comparatively high GDP per capita, relatively small and well-connected population of 5 million, and a plethora of natural resource and environmental laws and policies (Peart et al., 2019; Scott, 2021). The country is in the early stages of reform of the RMA, and local and regional government structural reform. In addition, scoping is underway for regulatory reform of coastal and ocean management (Parker, 2021). There is also an emerging national discourse on decolonisation (Joseph et al., 2020; Mercier, 2020).

The country has a large Exclusive Economic Zone (EEZ), at approx. 4.2 million km², which spans 30° of latitude from the subtropics to the Southern Ocean (Gordon et al., 2010). This area provides a range of ecosystem services and supports wild and farmed fisheries to the value in excess of \$US1 billion revenue yearly (Yeoman et al., 2019). The EEZ and extended continental shelf cover approximately 1.7% of the world’s ocean, and host a diverse array of marine habitats and associated biodiversity (Gordon et al., 2010; MacDiarmid et al., 2013).

Aotearoa NZ promotes itself as ‘100% pure’ and ‘clean and green’, trading on the scenic beauty of different land- and sea-scapes to attract tourists. At the same time, government reports on the state of the marine environment present a different and contrasting picture, with multiple and cumulative stressors degrading ecological functioning and damaging ecosystem services (NZ Government, 2016; 2019). A core objective of the new Aotearoa NZ Biodiversity Strategy, called Tūāpapa, also seeks to ensure that effective governance, legislative and funding systems are in place for biodiversity to thrive in all ecosystems, including the marine environment (NZ Government, 2020). It is timely then to have studies of critical aspects of the regulatory seascape to identify management issues that require resolution within these reform processes. This helps to avoid cognitive bias and substitution in developing solutions that specifically address those issues (Kahneman, 2011).

The interplay between central and regional government is not the only potential source of regulatory fragmentation at different scales within Aotearoa NZ. We also examine the regulatory role of Māori. MEBM may become one of the mechanisms that could support and contribute to the relational sphere between government and Māori as Te Tiriti partners (Mutu and Jackson, 2016), where overlapping jurisdictions and management of ecosystems are shared. MEBM could also provide a platform to help facilitate the coevolution of marine governance and management with Māori as the MCAA begins to be implemented, and historical and contemporary grievances are progressively settled (Taylor et al., 2018; Reid and Rout, 2020).

1.3. Administering marine habitat legislation in Aotearoa NZ

The laws pivotal to habitat management are administered by different government agencies. Fisheries New Zealand (Fisheries NZ), a division of the Ministry for Primary Industries, has responsibility for the FA. Regional councils and unitary authorities (hereafter ‘regional councils’) administer the RMA and prepare regional coastal plans jointly with the Minister for Conservation. Te Arawhiti (the Office of Māori Crown Relations) manages Māori claims for customary marine title or protected customary rights under the MCAA. Once the claims have been recognised, customary rights holders have strengthened statutory relationships with regional councils, and with the Ministers of Conservation, and Oceans and Fisheries.

Other government agencies have legislative marine management responsibilities, which are peripheral to this study. These include: the Department of Conservation (DoC), which administers the Wildlife Act 1953, Marine Mammal Protection Act 1978 and Marine Reserves Act 1971; and the Environmental Protection Authority, which has statutory oversight for environmental management of non-fisheries activities beyond the outer limit of the territorial sea under the EEZ and Continental Shelf (Environmental Effects) Act 2013 (Peart et al., 2019; Scott, 2021).

The ability of Māori to make regulatory decisions is provided for within the RMA, however these powers have seldom been enabled. For example, there is an ability to transfer regional council functions, duties or powers to an iwi authority under section 33, although only one instance has occurred and that related to environmental monitoring of Lake Taupō (Ngāti Tūwharetoa Trust Board, 2021; Rennie et al., 2021). The RMA also makes provision for Māori to assist regional councils to comply with their statutory duties via formal agreements (sections 58L-58U). This has also occurred once, which related to governance and planning for drinking water, wastewater, stormwater, flood management and erosion protection in part of the South Island (West Coast Regional Council and Poutini Ngāi Tahu, 2020).

Although rāhui can be put in place, lifted or changed by Māori as a cultural practice, Māori can request regional councils to put activity controls in regional coastal plans as a form of rāhui (Court of Appeal, 2019). The controls endure until the review of the existing regional coastal plan, which must commence after 10 years (section 79 RMA). Rāhui may also be utilised as a form of a temporary closure of up to 2

years to all users of an area or fishery under the FA (sections 186A-186B). After public consultation, the Minister of Fisheries may grant a request from Māori who have exercised cultural practices within that area for many years. Rāhui are not the only cultural marine management practice used by Māori. The FA makes provision for taiāpure (customary fishing local areas) and mātaītai (customary and recreational fishing) areas (Hepburn et al., 2019). In these areas, Māori can recommend controls to the Minister of Oceans and Fisheries to regulate fisheries, to preserve customary food gathering practices, or for spiritual or cultural reasons. The Minister has the statutory powers to make decisions, and also appoints the taiāpure committee of management, which “holds office at the pleasure of the Minister” (sections 184a-184d FA).

The implementation of the FA, RMA and MCAA occurs at different scales that overlap, but are not generally aligned within the territorial sea (i.e., from mean high water springs out to 12 nautical miles) (Figs. 1–3). This is for a range of reasons; including:

- Spatial allocation of different harvested species under the FA’s Individual Transferable Quota (ITQ) system. Within each FA management area, there are different-sized sub-areas for different fish and shellfish species, resulting in a mosaic of management areas that pose challenges to integration and alignment at an ecosystem scale.
- Regional authority jurisdictions for environmental management under the RMA.
- Rohe (tribal areas) of iwi, hapū, and whānau (extended family) which are central to the process of formal recognition of customary marine title or protected customary rights under the MCAA. The request to the Minister of Fisheries to formalise rāhui for fisheries sustainability reasons is done by iwi, hapū, or whānau at a similar or smaller scale to the areas claimed under the MCAA. This is because of the exercise of authority (tino rangatiratanga) and guardianship (kaitiakitanga) over a geographical area of coastal land (mana whenua) and/or ocean (mana moana) (Kawharu, 2000; Mead, 2016; Reid and Rout, 2020).

1.4. Key differences in managing biogenic habitats

There are regulatory differences in the protection of biogenic habitats between the FA and RMA. The environmental principles specified in section 9 FA are not framed as a mandatory outcome, with persons exercising functions under the Act only required to “take into account [that] ... habitats of particular significance for fisheries management should be protected”. Perhaps as a consequence, Cryer et al. (2016) reported that after 20 years of the FA, Fisheries NZ managers had not formally defined habitats of particular significance, nor developed operational guidelines to identify and protect them. In 2021, the Prime Minister’s Chief Science Advisor identified this as a specific and priority

area for improvement in fisheries management (Gerrard, 2021).

In contrast, the RMA requires regional councils under section 6(c) to “recognise and provide for ... the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna” in the coastal marine area. They are also required to maintain indigenous biodiversity under section 30(1)(ga) RMA, and are directed by the New Zealand Coastal Policy Statement (NZCPS), which must be given effect to in regional planning under section 67(3)(b) RMA, to avoid significant adverse effects of activities on indigenous biodiversity (Department of Conservation, 2010). For example, Policy 11(b)(ii) NZCPS 2010 specifies protection for “habitats in the coastal environment that are important during the vulnerable life stages of indigenous species”. Similar to the FA, neither the NZCPS 2010, nor the RMA, place a mandatory requirement to actively identify these areas. However, section 35(1) of the RMA requires local authorities to gather such information, and undertake and commission such research, as is necessary to carry out its functions effectively. In practice, this is partly dependent on marine management being prioritised, and favourable political and economic conditions regionally. The funding for ongoing marine survey and monitoring is sought by regional councils from their communities separately under the Local Government Act 2002. This is done through a prescribed consultation process for obtaining funding primarily by setting annual rates (property tax) and/or user-pays (i.e., coastal occupancy charges) that may be formally brought into effect under section 64A RMA.

Regional plans have generally not attempted to control the effects of fishing activity, as there has been ongoing contention over the extent to which the RMA could control fishing activities authorised under the FA. In 2019, the statutory relationship between the RMA and FA in marine regulation was clarified (Court of Appeal, 2019). The Court found that the two Acts are designed to be complementary. The inference is that regional council coastal plans and fisheries management should also be integrated in practice (Ulrich, 2020). The Court focused on regional councils’ functions and jurisdiction to manage fishing to maintain biodiversity. Legal argument centred on the meaning of section 30(2) RMA which prevents regional councils performing their functions to control the taking, allocation or enhancement of fisheries resources for the purpose of managing fishing or fisheries resources controlled under the FA. The court found that the two Acts have overlapping objectives. The FA is concerned with ensuring sustainable utilisation, and only to the extent appropriate to secure future stocks does it require decision-makers to protect the aquatic environment. Control of the adverse effects of fishing on the environment is still required under the RMA. In particular, the function of maintaining indigenous biodiversity was expressly allocated to regional councils by the country’s Parliament (section 30(1)(ga) RMA). The Court noted a range of statutory indicators, including that the maintenance of biodiversity could be weighed against other considerations within the FA, whereas in the RMA

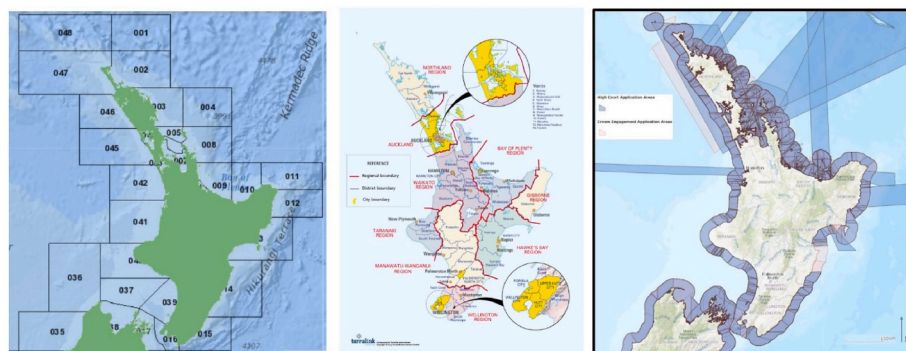


Fig. 1. Map of fisheries reporting areas around the North Island of New Zealand (left); regional council administrative boundaries (centre); and different Māori claims for customary marine title or protected customary rights, which have yet to be resolved by court action or direct negotiation with the government (right).

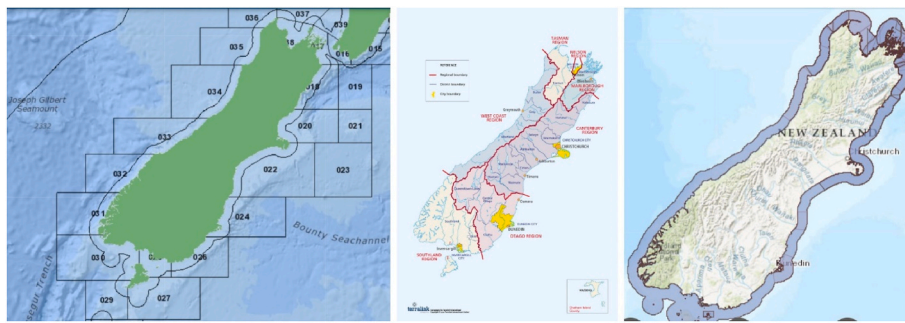


Fig. 2. Map of fisheries reporting areas around the South Island of New Zealand (left); regional council administrative boundaries (centre); and different Māori claims for customary marine title or protected customary rights, which have yet to be resolved by court action or via direct negotiation with the government (right).

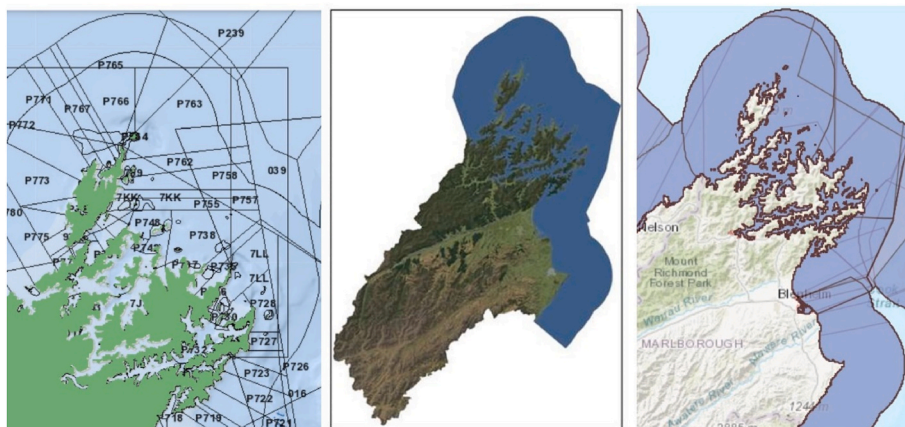


Fig. 3. Map of reporting areas for different fish species around Marlborough, New Zealand (left); regional council administrative boundary out to 12 nautical miles for the Marlborough District Council (centre); different iwi and hapū claims for customary marine title or protected customary rights out to 12 nautical miles (right).

it is a mandatory function. There are also different definitions of biodiversity between the two statutes, with the FA omitting the key words from the CBD definition: “and the ecological complexes of which [living organisms] are a part” (Ulrich et al., 2018). The RMA definition is consistent with the CBD. This is germane because ecological complexes include biogenic habitat types, some of which, such as shellfish beds, bryozoan fields, sponge gardens, rhodolith (maerl) beds, are vulnerable to damage from heavy bottom-contact fishing methods (Morrison et al., 2014).

The footprint of bottom-trawling, and dredging in inshore waters, is extensive within the territorial waters and shallow shelf seas of Aotearoa NZ’s EEZ. There are significantly large benthic protected areas where bottom-trawling is prohibited over 1.1 km², which arose from an initiative of the fishing industry (Helson et al., 2010). These areas cover approximately 30% of the EEZ, although 82% of the areas are waters >1500 m depth that are too deep for bottom trawling (Rieser et al., 2013). The shallower, more productive waters of the territorial sea and EEZ are subject to relatively few restrictions on bottom-trawling (Helson et al., 2010; Rieser et al., 2013). From 2008 to 2018, the annual trawl footprint was an estimated 9,000,000 ha of seabed (Gerrard, 2021); and from 1990 to 2019, a total estimate of 460,627,000 ha had been exposed to bottom-contact fishing at least once during that period (Baird and Mules, 2021). Consequently, there are likely to be relatively few extensive areas of intact biogenic habitats on soft sediments remaining in regions, such as Marlborough (Davidson et al., 2011; Anderson et al., 2020). The actual extent of different biogenic habitat types is unknown due to a paucity of publicly available data, but bottom-contact fishing activity is a recognised key threat (Thrush and Dayton, 2002; Anderson et al., 2019).

2. Methods

To elicit data on the management of biogenic habitats we made requests in March 2021 to two government agencies and the sixteen regional councils under Aotearoa NZ’s laws for the release of official information held by these agencies (Table 1). We adopted this method as the questions were standardised; required a formal statement of position from each respondent; the statutory imperative meant a complete dataset would be gathered to enable comparative analysis, and progress can be tracked over time. A drawback is that contextual information and nuanced perspectives that could be gained by anonymised interview data were not gathered. We also searched their websites for information on court appeals of regional coastal plans under the RMA. The official information request related to how institutions responded to the 2019 Court of Appeal ‘Motiti’ decision on controlling fisheries to maintain biodiversity; what agreements had been made to better integrate FA and RMA responsibilities within each regional jurisdiction; and what level of resourcing was allocated to the survey and monitoring of benthic biogenic habitats. Data were organized into tables according to each question, to enable comparative analysis. Each council was requested to confirm that we had accurately summarised their responses.

An additional official information request was also made specifically to Fisheries NZ in March 2021 for any existing or planned database on past and present rāhui in the form of temporary closures under the FA. In addition, any formal decision papers were sought that related to the decline of an application by Māori for a temporary closure of fishing under s186A and s186B of the FA to support rāhui. The statutory purpose for a temporary closure is to assist in replenishing, or improving the availability and/or size of stocks of fish, aquatic invertebrate or seaweed

Table 1

Information sought from central and regional government agencies with different statutory responsibilities for the management of indigenous biodiversity within New Zealand's territorial sea.

Agency	Regulatory Role	Questions
Fisheries New Zealand (FNZ) (within the Ministry for Primary Industries)	Fisheries management under the Fisheries Act. Management of the aquatic environment for sustainable utilisation of fisheries resources, including to avoid, remedy or mitigate the adverse effects of fishing.	<ul style="list-style-type: none"> • What resources are currently allocated, or planned to be allocated, to assist regional councils to give effect to the Court of Appeal 'Motiti' decision? • What agreements have been entered into, or are planned, with local government councils and/or iwi to give effect to the decision?
Department of Conservation (DoC)	Territorial authority for the Sub-Antarctic Islands and the Kermadec Islands under s31A Resource Management Act. [Note: also responsible for the development of the NZ Coastal Policy Statement under section 57 RMA, including biodiversity policies and objectives; and the approval of regional council coastal plans under s 64 RMA.]	<p>For the Sub-Antarctic and Kermadec Islands:</p> <ul style="list-style-type: none"> • What objectives, methods, policies and rules are in place to regulate fishing activities to maintain biodiversity? • Is it intended to revisit the existing regional coastal plans in light of the 'Motiti' decision? • What resources are currently allocated, or planned to be allocated, to give effect to the Court of Appeal 'Motiti' decision? • What agreements have been entered into, or are planned, with local government councils and/or iwi to give effect to the decision? • How is "maintain" in maintaining biodiversity defined in your regional coastal plan and what is the source for this definition.
Regional council and unitary authorities: Auckland, Bay of Plenty, Canterbury, Gisborne, Hawke's Bay, Manawatu-Whanganui, Marlborough, Nelson, Northland, Otago, Southland, Taranaki, Tasman, Waikato, West Coast, Wellington	Implementation of the NZ Coastal Policy Statement, including maintenance of indigenous biodiversity in the territorial sea. Monitoring of the state of the environment.	<ul style="list-style-type: none"> • What objectives, methods, policies and rules are in place to regulate fishing activities to maintain biodiversity? • Is it intended to revisit the existing regional coastal plan in light of the 'Motiti' decision? • What resources are currently allocated, or planned to be allocated, to give effect to the Court of Appeal 'Motiti' decision? • What agreements have been entered into, or are planned, with central government and/or iwi to give effect to the decision? • How is "maintain" defined in maintaining biodiversity in the regional coastal plan and other plans and policies, and what is the source for this definition

species; or to assist in recognising or making provisions for Māori use and management of non-commercial fishing rights. Fisheries NZ advised that there is no publicly-curated database, and information on FA temporary closures was only collated from 2015. We then searched all public consultations on the Fisheries NZ website, which dated back to 2012. We also examined the New Zealand Gazette where a FA temporary closure is officially notified. In addition, a Google search, and a search within three national media sites (nzherald.co.nz, stuff.co.nz, rnz.co.nz) were made using the terms: "Rāhui" and/or "Temporary Closures". All results were recorded in a database along with the date, location, and reason(s) for declaration. No date period was specified, so all reports found were recorded. The earliest reports dated to 1998. These were cross-referenced with information from Fisheries NZ as to whether these were formalised as temporary closures under the FA.

The ability to seek the recognition of rāhui is also available to customary marine title holders under the MCAA. We examined the legislation and recent case law on how protections and prohibitions sought under the MCAA intersected with coastal planning in the RMA with respect to biogenic habitats. Findings were synthesised with evidence before the Environment Court on the Northland regional plan hearings, which the Court released upon our request.

3. Results

3.1. Regional council management of biogenic habitats

The majority of regional councils (9 of 16) have not commenced or completed a review of their regional coastal plan within the last 10 years (Table 2). Their existing coastal plans pre-date the current New Zealand

Coastal Policy Statement (NZCPS), which came into effect in December 2010 following a national public consultation process undertaken by a Board of Inquiry established under the RMA. Section 55 RMA requires councils to update their regional coastal plans to give effect to the NZCPS 2010 as soon as practicable.

Table 2 shows that three of the nine councils have coastal plans that are 20 years or older. Section 79 RMA requires councils to commence a review of their existing coastal plan within 10 years. Six councils have an active plan review underway, but only two of these have indicated a date for completion. Two of the 3 councils, who advised that there is no current review of their coastal plan underway, intend to commence a review at an unspecified date.

Since 2010, seven councils, and DoC (which has the functions of a regional council for the Kermadec and sub-Antarctic Islands), have given effect to the NZCPS through notification of their coastal plan for public submissions (Notified RCP - Table 2). All, except the West Coast Regional Council, have subsequently made formal decisions on the relief requested by submitters (RCP - Table 2). The West Coast Regional Council has deferred making decisions until after the completion of the government's resource management law reform, which is scheduled to be concluded in late 2022. A recent legislative amendment to the RMA (section 79AA) enabled councils to defer a review of their regional coastal plan until September 30, 2024 as a consequence of the Covid-19 pandemic.

Only one council, Marlborough, has voluntarily put in controls on fishing within their coastal plan (Table 2). This was for protection of benthic habitats, which contain fauna and/or flora assessed as significant under s6c RMA, from activities that physically disturb the seabed. These provisions are currently under appeal to the country's

Table 2

Status of regional council coastal plans (RCP) with respect to the NZ Coastal Policy Statement December 2010 (**red** dashed line), and the Court of Appeal 'Motiti' decision in November 2019 (**blue** dashed line). Two dates are shown: when each RCP was notified for public submissions (Notified RCP); and when the regional council made public its decisions on those submissions (RCP). Included are the offshore islands managed by the Department of Conservation (DoC) with the same duties and powers of a regional council under the Resource Management Act 1991.

Regional Council or Unitary Authority	Date of RCP after decisions on submissions	Date of Notified RCP for public submissions	Court of Appeal decision given effect	Comments
Bay of Plenty	2021	2014	Yes	Reserves where fishing prohibited placed around Motiti, Motunau and Motuhaku Islands in August 2021 after the Court of Appeal decision
Marlborough	2020	2016	Yes	Fishing activities that disturb seabed prohibited in all identified biogenic habitats assessed as significant under Section 6c RMA. Under appeal
Taranaki	2019	2018	No	TRC advised no specific controls on fishing but some policies could be applied to disturbances from fishing activities. Appeal points resolved
Wellington	2019	2016	No	Proposed Natural Resources Plan under appeal. Undertaking a review of existing information on the effects of bottom-trawling on biodiversity
Northland	2019	2017	No	Environment Court appeals from external groups to put controls on fishing to protect biodiversity
Auckland [§]	2016	2013	No	No specific provisions to manage fishing. Intend to review coastal plan for biodiversity outcomes. The 2016 Hauraki Gulf Marine Spatial Plan has controls on fishing, but is yet to be implemented
West Coast		2016	No	Notified plan specifically excludes managing fishing. Hearings on submissions deferred to enable completion of Regional Policy Statement. Deferred again to 2022 due government reforms
Kermadec & Subantarctic	2017	2011	No	Plan regulates operation of fishing vessels to prevent contaminant discharges and biosecurity breaches. Effects on biodiversity from fishing activities regulated under other legislation
Manawatū-Whanganui	2014	2007	No	No planned review of the regional coastal plan
Hawke's Bay	2014	2006	No	Regional coastal plan to be reviewed. Planned completion no later than 31 December 2024
Southland	2013	2007	No	Pre-NZCPS 2010, except marine farming provisions operative 2013. Coastal Plan under review 2017. No date for completion advised
Tasman	2011	2008	No	Current plan not yet amended to give effect to NZ Coastal Policy Statement 2010. Review underway. No date for completion advised
Canterbury		2005	No	Amendments to coastal hazard and port zone provisions in 2015 under Canterbury Earthquake Recovery Act. In early stage of regional coastal plan review. No date for completion advised
Waikato	2007	2004	No	Regional Coastal Plan under review from 2021. Public notification intended for early 2022. The Hauraki Gulf Marine Spatial Plan has controls on fishing, but is not yet implemented
Gisborne	1997	1997	No	Still some appeals on 1997 plan unresolved. RCP incorporated into 2020 Tairāwhiti Resource Management Plan, but coastal plan not operative. Coastal plan to be reviewed 2024-25, to include consideration of fishing controls
Nelson		1997	No	Regional coastal plan under review since 2017. No date for completion advised
Otago	2001	1994	No	Review not yet underway, indicatively scheduled to be complete by 2025/26

[§] Auckland Unitary Plan went through a different statutory process under the RMA and was made operative in part in 2016.

Environment Court from fishing interests challenging the extent and necessity of the controls, and whether mechanisms available under the FA should be preferred. Three other councils have faced, or are facing, court action from iwi or hapū, environmental groups, and/or DoC seeking to increase the protection of marine biodiversity from fishing activities. In several cases, councils have been joined by fishing interests, iwi groups and/or Fisheries NZ to defend their coastal plans against including provisions that constrain fishing. The Environment Court required the Bay of Plenty Regional Council in 2021 to amend their coastal plan to place controls on fishing around three islands, to comply with the requirement under the RMA to maintain biodiversity (Environment Court, 2020). The biodiversity provisions of the Taranaki regional coastal plan were also appealed on a similar basis, and the appeal included the criteria for identifying significant benthic habitats and the adequacy of protective measures (Environment Court, 2021a). The appeals were subsequently withdrawn following mediation. Northland Regional Council is awaiting a decision from the Environment Court about whether controls on fishing activities that disturb the seabed should be imposed in their plan (Environment Court, 2021b). In the Auckland and Waikato regions, recognition of the decline in ecological condition of the Hauraki Gulf led to the collaborative development from 2013 to 2016 of a non-statutory marine spatial plan, which aimed to identify long-term solutions to ensure the sustainability of ecosystem functions and to improve community wellbeing (Peart, 2019). The government commenced a consultative process in 2021 to implement the Hauraki Gulf marine spatial plan, that is to include spatial fishing controls for biodiversity protection, and which will lead to consequential changes to both regional coastal plans to more adequately maintain biodiversity (NZ Government, 2021).

The situation is different for the remote subtropical Kermadec Islands and the sub-Antarctic Islands managed by DoC. Policy 11 of the NZCPS was not implemented for protection of benthic habitats, given the existing restrictions on fishing under the FA and Marine Reserves Act 1971. No-take marine reserves encompass the territorial sea around the Kermadec, Auckland, and Antipodes Islands; and 39% and 58% of the coastal areas around Campbell and Bounty Islands respectively. Fisheries regulations prohibit bottom-trawling and dredging within the territorial seas of the Bounty, Campbell, and Antipodes Islands; trawlers >46 m in length and any foreign charter vessels are prohibited in the territorial sea around these and other sub-Antarctic islands under Aotearoa NZ's jurisdiction; and Danish seining is prohibited in the remaining Campbell and Bounty Island groups that do not have marine reserve status.

3.2. Funding for marine management

We now turn to the resources allocated by regional councils for ecological survey and monitoring of the territorial sea, and associated compliance, policy, and education (Table 3). It includes funding to collect biological and geomorphological data to identify habitats that may require the implementation of fishing controls to maintain biodiversity under the RMA.

Table 3 shows a lack of financial information provided, despite the specificity of the question asked. Only one council, Waikato, provided a quantum for a specific research project. The responses indicated that a well-resourced, ongoing survey and monitoring programme would be an exception. Two councils, Marlborough and Auckland, advised that they have or are undertaking seabed habitat mapping; and Marlborough has an annual survey and monitoring programme of biogenic habitats. A subsequent search of the Hawke's Bay website showed multibeam echosounder surveys in 2018 and 2019 over two areas of coarse cobble substrate.

Almost all councils advised that funding is, or would be sourced, from general rates, which are secured through community consultation and compete with other environmental functions and statutory demands. Only one council, Marlborough, is transitioning to annual

charging for occupancy of coastal water space for marine farms, marinas, jetties, and moorings. This funding mechanism is available to all councils under section 64A RMA; the revenue from which must be used to promote the sustainable management of the coastal marine area. Auckland introduced a targeted 'Natural Environment' rate in 2018 for a range of coastal and terrestrial environmental management issues; which is expected to raise NZ\$311 million over 10 years. However, the relative quantum to be assigned to marine initiatives was not specified, although an unspecified portion of the targeted rate is intended to support the government-led implementation process of the provisional Hauraki Gulf marine spatial plan.

The Bay of Plenty and Northland councils which have been subject to court action on specific areas for fishing controls to protect marine biodiversity, have no specific funding set aside for the implementation and ongoing management of any controls. Some councils advised of the existence of a budget for the coastal plan review; however, the quantum was not specified nor the relative priority to complete the review. Information was also not forthcoming on the funding required or specifically allocated to gather the data necessary to inform the management of biogenic habitats. The Nelson council reflected this: "to manage the effects of fishing on biodiversity, it is first necessary to know: a) the adverse effects occurring and where, and b) the marine biodiversity that exists". It acknowledged the need to address these knowledge gaps, but had not made a separate allocation within its coastal plan review budget.

The Court of Appeal confirmed that regional councils have the primary governance role to maintain biodiversity under the RMA (Court of Appeal, 2019). However, with the exception of the Marlborough council from 2011, only Fisheries NZ have undertaken comprehensive, ongoing research into identifying habitats of particular significance for fisheries management since the NZCPS. The first research projects occurred in 1999 and 2000, with at least 26 relevant separate benthic habitat studies completed since the gazettal of the NZCPS in December 2010 (Fisheries NZ, 2020a, 2021a). This included habitat mapping, vulnerability and risk assessments, ecological functioning and functional diversity, habitat use at different fish life stages, recovery after disturbance, connectivity, decision support tools, and new trawling technologies. Other government agencies have also funded or contributed funding to significant benthic biogenic habitat research since 2011, such as DoC (e.g., Lundquist et al., 2020), the Ministry for the Environment (e.g., Anderson et al., 2019), and the Ministry of Business, Innovation and Employment (e.g., Anderson et al., 2020).

3.3. Integration of Māori into marine management

Prior to 2019, the RMA was not recognised as having a role in controlling fisheries for the maintenance of biodiversity. Therefore, Māori groups did not seek to have rāhui recognised within council regional coastal plans. Since the Motiti decision, no council has signed formal management agreements with other agencies and/or Māori as a consequence of the Motiti decision to bridge and integrate different management scales. Bay of Plenty council have had discussions with iwi and hapū, DoC, and Fisheries NZ to formulate management agreements for the Motiti Marine Protected Area (MMPA). Fisheries NZ advised that no resources had been specifically allocated to assist the Bay of Plenty council to give effect to those marine protection measures. However, Fisheries NZ are providing support through education initiatives, engagement with Māori on the new protective measures, and joint enforcement patrolling of the MMPA in a discretionary capacity. In 2020, Fisheries NZ established a team to work on coastal planning processes. The Marlborough council set up an inter-agency management group of staff with Fisheries NZ and DoC in 2020, although the terms of reference have yet to be agreed, and Māori are not yet involved. Southland is undertaking the review of its coastal plan in consultation with Ngāi Tahu hapū resource management group Te Ao Marama, and will include planning decisions for any marine biodiversity protection. Hawke's Bay council has a collaborative coastal group involving

Table 3

Regional council resource allocation to marine ecological survey and monitoring of the territorial sea, and compliance, policy, and education. Also shown is the funding mechanism; rates are property taxes levied each year under the Local Government Act (LGA) 2002. Coastal occupancy charges are user-pays charge for coastal space, which are also set under the LGA. The **blue** dashed line is the timing of Court of Appeal 'Motiti' decision relative to each council's regional coastal plan; and the **red** dashed line is the date of the NZ Coastal Policy Statement relative to plans (see Table 1).

Council	Resources to implement Court decision	Funding mechanism	Comments
Bay of Plenty	None	General rates	Anticipates reprioritising existing resources to educate about the no fishing areas around the three offshore islands. Unclear what resources needed but long-term general rates funding anticipated
Marlborough	Significant, not specified	Moving to occupancy charges	Existing annual benthic habitat survey and monitoring programme funded by general rates, with contribution from DoC. More extensive seabed mapping funded by general rates and co-investment by Government
Taranaki	Not specified	General rates	No detail provided on science and monitoring. Comment on compliance and enforcement of plan rules
Wellington	Not specified	General rates	Science provider contracted to provide updated information on the region's coastal marine area. This will identify state, activities, pressures, and vulnerability and be used within the regional coastal plan review
Northland	None	N/A	Resources currently allocated to responding to appeals on proposed regional coastal plan which was notified prior to the 2019 Court of Appeal decision
Auckland	Financial and staff time (unquantified)	Targeted rate	Natural Environment targeted rate expected to raise \$311 million over 10 years (from 2018). Three key areas (a) Seabed mapping to identify high biodiversity values; (b) Provide input into implementation process Hauraki Gulf spatial plan; (c) Liaising with other councils
West Coast	None	General rates	General rates fund the policy plan process, but no details provided of allocation of resources between functions
Kermadec & Subantarctic ⁸	None	N/A	No resources currently allocated, or planned to be allocated, to give effect to the Court of Appeal decision, given the existing statutory protections in territorial seas
Manawatu-Whanganui	None	N/A	No information to provide as the matter has not been considered by the council
Hawke's Bay	None	General rates	No resources currently allocated or planned to be allocated solely to realign planning documents with the Court of Appeal decision
Southland	Not specified	General rates	The regional coastal plan review has a budget and this process will include consideration of the Court decision
Tasman	None	General rates	The regional coastal plan review has a budget and this process will include consideration of the Court decision. No decision on how budget to be allocated between survey and monitoring, compliance, policy, education
Canterbury	None	N/A	Has not currently allocated, or planned to allocate, resources to give effect to the Court's decision
Waikato	\$100,000	General rates	Commissioning technical reports to inform regional coastal plan review. Map and assess sea urchin/kina (<i>Evechinus chloroticus</i>) barrens for Mercury Islands
Gisborne	None	General rates	No specific resources allocated, but general rates funding for plan making, including engagement and the evidence base to underpin plan making
Nelson	None	General rates	Both the regional plan review and the funding for the proposed coastal and marine environmental monitoring programme (water quality monitoring and coastal and benthic restoration) subject to long-term plan process
Otago	None	General rates	The regional coastal plan review will determine the allocation of resources through a long-term plan process

government agencies, iwi, and commercial and recreational fishing interests, which aims to recommend improvements to the evidential base for decisions.

3.4. Rāhui formalised under fisheries Act

The FA has been the primary legislative mechanism used to recognise rāhui. There were 18 rāhui identified over the period 1998 to 2021 that the Minister of Fisheries considered for a temporary spatial fishing closure by under sections 186A or 186B FA (Table 4). Fourteen were approved, and two are awaiting a Ministerial decision following public consultation. Only one application was declined, which was over Ōtāiti (Astrolabe) Reef near Motiti Island in 2016, on the basis that using it as a tool to maintain aquatic life until a marine reserve could be established did not fit the statutory purpose of such temporary closures. One application over South Bay in Kaikōura was withdrawn by the applicant. Most closures were due to concern about the localised depletion of shellfish and several closures encompassed a ban of the harvest of any aquatic life.

Table 4 shows an upsurge in applications since 2019, with six in 2021. Four rāhui have been renewed for multiple periods, with the longest running dating back to 2002. One temporary closure implemented in 1998 expired in 2006, after the Ministry of Fisheries advised the iwi that s186A FA was not designed as a permanent tool for customary fisheries management. In 2021, a new application by the same iwi off the eastern Coromandel was approved (Table 4).

Temporary closures to recognise and support rāhui are established by Ministerial decision under s186A or s186B of the FA. These are to

recognise and make provision for the use and management practices of Māori in the exercise of non-commercial customary fishing rights. There is no statutory mechanism for Māori to directly implement controls to maintain or protect biogenic habitats. The Minister of Fisheries' assent is required, even if the rāhui is sited within a taiāpure (local customary fisheries management area). A taiāpure management committee comprised of local Māori community representatives can only make recommendations for the conservation and management of fish, aquatic life, or seaweed.

There was one rāhui identified to restore fisheries and biodiversity administered by hapū only. In 2017, Te Whānau Moana and Te Rorohuri placed a rāhui over 384 ha in Maitai Bay, Northland (Jackson, 2019). In 2020, fish diversity and abundance showed signs of recovery (Bone et al., 2020), and the rāhui was extended to 2025 (Whetu Rutene in Te Karere, 2020).

The primary reason given by applicants for FA temporary closures was to support customary rāhui. This was either because the rāhui had not been effective by the time of application; for example, Ngāi Hapū o Waimarama, Hawkes Bay (Fisheries NZ, 2020b), or to support the rāhui from the outset (e.g., Ngāti Tamaterā, Waikato) (Ngāti Tamaterā Treaty Settlement Trust, 2019). Six temporary closures had been renewed at least once, with the longest established in 2002 (Table 4). The consistent reason for ongoing renewals was the slowness of recovery of fisheries and habitats. For example, fishing was closed in 2010 over seven subtidal reefs in Maunganui Bay, Northland to support the rāhui placed by the Ngāti Kuta iwi. By 2020, signs of recovery were evident in six reefs with kelp regrowth, and snapper (*Pagrus auratus*) and rock lobster (*Jasus edwardsii*) had increased in abundance (Fisheries NZ, 2020c).

Table 4

Number and date of rāhui formally considered for temporary closures under the Fisheries Act 1996 identified from cross-referenced searches of the Fisheries New Zealand and NZ Gazette websites, and three authoritative news websites (see Methods). Excluded were temporary closures put in along the Kaikōura and eastern Marlborough coasts after extensive earthquake disturbance in 2016; a controlled area notice under the Biosecurity Act in 2020 in Foveaux Strait due to an oyster parasite; and sustainability measures under s11 FA in two Northland estuaries to restrict shellfish harvesting for customary purposes only. Note that s186A applies to North Island fisheries, and s186B to South Island fisheries as per the spatial area defined by the Ngāi Tahu Claims Settlement Act 1998.

Year	Purpose of rāhui	Location	Duration	Temporary closure regulation and iwi/hapū making application
2021	Replenish pāua (<i>Haliotis iris</i>) population, enable Māori to exercise customary rights	West Coast, Open Bay	2 years	Approved, s186B, Te Rūnanga o Makaawhio
2021	Replenish aquatic life, by no take of any species of fish, aquatic life, or seaweed	Canterbury, Ōpihi	1 year	In consultation, s186B, Fisheries Act. Te Rūnanga o Arowhenua
2021	Replenish scallop populations (<i>Pecten novaezelandiae</i>)	Northland, Whangaroa	2 years	In consultation, s186A FA. Nga Hapū o Karangahape marae
2021	Replenish scallop populations (<i>Pecten novaezelandiae</i>), protect benthic habitat	Waikato, Coromandel	2 years	Approved s186A Fisheries Act. Ngāti Hei Trust.
2021	Close area to pāua harvest by Ōnuku marae to enable replenishment	Canterbury, Akaroa	Open-ended	Approved. S186B FA. Akaroa Taiāpure Management Committee
2021	Replenish shellfish and rock lobster (<i>Jasus edwardsii</i>) populations	Auckland, Waiheke Is	2 years	Approved, s186A Fisheries Act. Ngāti Pāoa
2020	Close area to pāua (<i>Haliotis iris</i>) harvest to enable replenishment	Hawke Bay, Waimarama	2 years	Approved, s186A Fisheries Act. Ngāi Hapū o Waimarama.
2019	Replenish shellfish populations. This is a separate application over the area in 1998	Waikato, Coromandel	2 years	Approved, s186A Fisheries Act. Ngāti Tamaterā.
2018	Replenish shellfish populations at Mair and Marsden banks, Whangarei Harbour	Northland, Whangarei	4 years (renewed)	Approved, s186A FA. Patuharakeke Te Iwi Trust Board
2018	Replenish aquatic life, by no take of any aquatic life Te Rae o Tawhiti (South Bay)	Canterbury, Kaikōura	2 years	Withdrawn, s186B FA. Te Taumanu o Te Waka a Māui Taiāpure
2016	Replenish pāua (<i>Haliotis iris</i>) by no take. Mapoutahi Peninsula. New rāhui 2016	Otago, East Otago	Open-ended	Approved, s186B FA. East Otago Taiāpure Mgmt Committee
2016	Replenish Ōtāiti/Astrolabe reef by no take of all fisheries resources	Bay of Plenty	2 years	Declined, s186A. Motiti Rohe Moana Trust
2010	Replenish aquatic life, Closed to fishing except kina (<i>Evechinus chloroticus</i>)	Northland, Maunganui	12 years (renewed)	Approved. s186A FA. Ngāti Kuta me Patukeha. Renewed 2019
2010	Replenish pāua (<i>Haliotis iris</i>) by no take. Huriawa Peninsula. Renewed 2016.	Otago, East Otago	No end date	Approved, s186B FA. East Otago Taiāpure Mgmt Committee
2006	Replenish tuangi/cockle (<i>Austrovenus stutchburyi</i>) at Umupuia, Hauraki Gulf	Auckland, Clevedon	16 years (renewed)	Approved, s186A FA. Ngāi Tai Ki Tāmaki Trust.
2002	Protect green-lipped mussel beds (<i>Perna canaliculus</i>) Moturiki & Motuotau Islands	Bay of Plenty	Ended 2009	Approved, s186B FA. Ngāi Te Rangī, Ngāti Ranginui, Ngāti Pukenga
2002	Replenish aquatic life, by no take of any aquatic life Waiopuka (Wakatu Quay)	Canterbury, Kaikōura	20 years (renewed)	Approved, s186B FA. Kaikōura Marine Guardians. Renewed 2019
1998	Replenish cockles and pipi. New temporary closure in 2019 approved.	Waikato, Coromandel	Ended 2006	Approved, s186A Fisheries Act. Ngāti Tamaterā.

Closures are revoked after 2 years, but can effectively continue if the Minister of Fisheries approves another application from Māori. The new application is also subject to public consultation. In contrast, controls on fishing to protect biodiversity under the RMA endure for at least 10 years, unless there is a regional coastal plan change in the interim. In an appeal to the proposed Northland Regional Coastal Plan, the Ngāti Kuta iwi requested that RMA controls be put in place to give better effect to rāhui by providing a longer term than the existing s186A closure (Environment Court, 2021b). The appeal identified the need to alleviate fishing pressures on rocky reef habitats, so as to reduce kina (*Evechinus chloroticus*) herbivory on kelp forests. In their appeal, the Bay of Islands Maritime Park referred to the rāhui, which permits removal of kina only, as a mechanism that could be adopted within the regional coastal plan to enable kaitiakitanga (guardianship) and to better protect biogenic habitats.

Another appellant to the Northland plan, Te Uri o Hikihiki a hapū of Ngātiwai iwi, proposed a rāhui tapu (sacred prohibition under the protection of atua (Māori gods)) as an equivalent to a marine protected area in another discrete part of the eastern Northland coast (Environment Court, 2021b). This is being opposed, along with other proposed fishing controls, by the Ngātiwai Trust Board and Te Rūnanga-ā-Iwi o Ngāpuhi to protect the value of the 1992 Te Tiriti o Waitangi pan-iwi fisheries settlement, with support from Te Ohu Kaimoana (a trust established by the Māori Fisheries Act 2004, which represents 58 iwi organisations and is to act as guardian of commercial fisheries settlement agreements), and to interrogate whether fishing controls under the RMA are the most appropriate mechanism to protect biodiversity as opposed to the FA (Te Ohu Kaimoana, 2020; Ngātiwai Trust Board, 2021).

The Environment Court heard the Northland regional coastal plan appeals in July 2021 and an outcome is pending. The case is centred on: (1) the extent to which the proposed RMA fishing controls and the process by which they would be incorporated into the Northland Regional Coastal Plan accords with Māori tikanga (customary practices and protocols - see Mead, 2016); and (2) whether RMA fishing controls derogate from the 1992 pan-iwi fisheries settlement. Regional councils are required by Policy 11(b)(iv) NZCPS to avoid significant adverse effects of activities on habitats of indigenous species that are important for cultural purposes. The Court of Appeal were not asked to examine this in the Motiti case, but noted the potential for conflict and the Te Tiriti implications that would need to be addressed in legal argument. The Northland case is a microcosm of the habitat management, protection, and restoration issues that need to be reconciled at, and between, different scales. It is important to note that the Northland regional coastal plan court case may help untangle the complexity for regulators when hapū and iwi are in opposition with each other as to how localised declines in marine life could be most effectively addressed.

3.5. Rāhui under the Marine and Coastal Area (Takutai Moana) Act

We now examine the recent case law around the MCAA. In particular, we consider the extent to which MCAA title holders may influence and/or control activities that may affect the health of biodiverse benthic habitats. Māori claimant groups can seek either 'protected customary rights' or a 'customary marine title'; which are different limited legal statutory rights that acknowledge customary interests over the common marine and coastal area. A protected customary right encompasses traditional practices that have been exercised since the 1840 signing of Te Tiriti, including collecting hāngi stones (for buried ovens) or launching waka (canoes) (Waitangi Tribunal, 2020). Permission is not required for protected customary right holders to undertake activities that would normally require resource consent under the RMA. Regional councils are prevented from granting RMA consents for activities which are likely to have adverse effects on a customary rights area, unless permitted by the relevant protected customary rights group (s55 MCAA).

The recognition of customary marine title is a stronger inalienable interest in land, which can be recognised or negotiated for Māori applicant groups under the legislation. The MCAA sets out the process for obtaining customary marine title, as well as the rights that attach to its recognition or grant. Progress has been slow nationally in addressing claims due to procedural unfairness and inadequate resourcing issues for claimants, which may potentially generate new grievances under Te Tiriti (Waitangi Tribunal, 2020). Claimants are able to either negotiate directly with the Crown or have their claims determined by the High Court. By the April 2017 statutory deadline for lodging claims, 385 claims were lodged with the Crown (Te Arawhiti, 2021a), and 205 with the High Court (High Court, 2021a). The Crown has now sped up the process to better resource claimants (Te Arawhiti, 2021b). This is irrespective of whether the claim has been lodged with the Crown or in the High Court.

There is legal uncertainty over whether RMA permission rights apply to fishing, as MCAA section 28 preserves the exercise of any fishing rights conferred or recognised under the FA in a customary marine title area. The exception is the stipulation under section 79(2)(a) MCAA where the ability to affect the exercise of fishing rights is limited to protect any wāhi tapu area. Wāhi tapu are places sacred to Māori in the traditional, spiritual, religious, ritual, or mythological sense (s9 MCAA). The scale of wāhi tapu in marine title areas has yet to be determined, as very few customary marine titles claims are settled. The conditions of a wāhi tapu could constrain certain fishing techniques but not the lawful catch entitlement in a quota management area. An example is restricting the use of bottom-contact fishing gear to protect the habitat of a threatened seabird that relies on visual acuity to hunt prey on or above the seabed. In the Marlborough coastal plan, approximately 350,000 ha was zoned in 2020 as potential feeding areas for the endemic king shag (*Leucocarbo carunculatus*) (Fig. 4). The plan requires the actual or potential adverse effects of any activity on king shag feeding to be taken into account. King shag are a taonga to the Ngāti Kōata iwi (Ngāti Kōata No Rangitoto Ki Te Tonga, 2002), and to the Ngāti Kuia iwi in the Marlborough Sounds marine area:

“Our tipuna [ancestor] Kupe explored this area with the use of guardians. One of these was a King Shag called Te Kawau-a-Toro. His role was to test the currents of the sea to ensure it was safe to travel

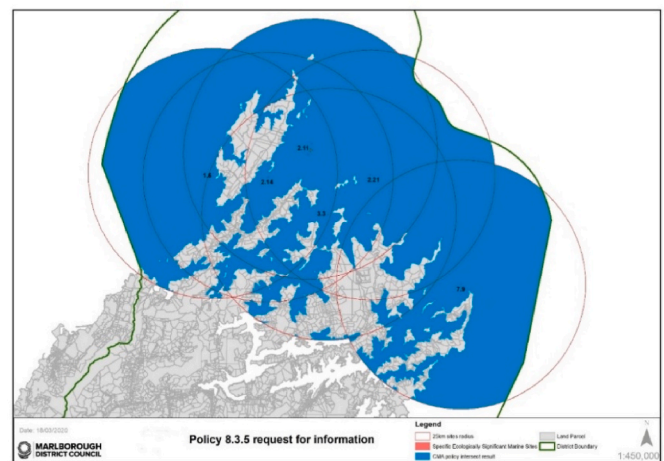


Fig. 4. Area of coastal marine area administered by the Marlborough council, Aotearoa NZ (green outline). The areas in blue are where the Marlborough council has established a policy under the Resource Management Act (RMA) to require an assessment of actual or potential effects of activities where the endemic king shag (*Leucocarbo carunculatus*) forage around nesting sites (identified by numbers). This may include the effects of fishing. A successful claim for customary marine title will provide the title holder(s) with statutory authority under the Marine and Coastal Area (Takutai Moana) Act to potentially decline any RMA consent application in this area if they so determine.

through. When Kupe arrived at the entrance to the Pelorus Sound he asked Te Kawau-a-Toro to test the currents, this he did. But when he asked him to test the currents at French Pass he broke his wing and drowned. Kupe named this place Te Aumiti a Te Kawau-a-Toru. The descendants of Te Kawau-a-Toro remained as kaitiaki, guardians.” (Environmental Protection Authority, 2013 at [510] p176).

The Marlborough plan is currently under appeal to the Environment Court. Claims for MCAA marine customary title in the Marlborough coastal marine area are also yet to be determined. The area claimed by the Ngāti Kuia iwi (Te Arawhiti claim MAC-01-12-20) includes Pelorus/Te Hoiere Sound which is within Fig. 4, as is the area Ngāti Kōata claim around D’Urville Island/Rangitoto ki te Tonga (Te Arawhiti claim MAC-01-12-07).

4. Discussion

4.1. Impediments to marine ecosystem-based management

It has been suggested that MEBM can be achieved incrementally under existing arrangements through collaborative processes (Curtin and Pallezo, 2010), and social learning (Berkes, 2010). However, this requires institutions to function as they are mandated to do. In our study, regional councils are largely failing to undertake core statutory tasks, such as reviewing their regional coastal plans (Table 2). Funding for marine biodiversity survey and monitoring is also inadequate (Table 3). The continuing degradation of the marine environment from land and marine activities reflects the systemic management failure of regional councils (NZ Government, 2016; 2019). The ongoing damage to biogenic habitats by bottom-trawling and dredging, that has occurred over a scale similar to Amazonian rainforest clearance from 1990 to 2018 (Ulrich, 2017; Baird and Mules, 2021), also reflects the failure of central government management (Gerrard, 2021). These issues are not new to central and regional government, which were, for example, identified in a review of the NZCPS implementation for the management of marine biodiversity (Department of Conservation, 2018). As Helson et al. (2010, p.563) state: “As a matter of good public policy fishing should never risk the integrity of the ecosystem, regardless of whether it occurs near or above the seabed”.

Councils may argue that marine biodiversity was commonly thought to be a FA not a RMA function, and therefore did not require a high level of attention and resources. The biodiversity provisions in the 2010 NZCPS would suggest otherwise. Given the failure of the majority of councils to give effect to the 2010 NZCPS (Table 2) and more latterly the Court of Appeal decision, along with inadequate ongoing future funding commitment, the role of regional councils in managing coastal and marine biodiversity needs attention. Our survey of councils also revealed confusion between councils as to what ‘maintain’ means for biodiversity, with several councils suggesting that this was the continuation of the current state. Marine biodiversity cannot be maintained without taking action to restore ecological functioning by minimising disturbance to enable recovery of species diversity through recolonisation and succession (Thrush et al., 2001; Thrush and Dayton, 2002, 2010; Ulrich et al., 2018). Loss of biodiversity reduces the efficiency by which biogenic communities capture biologically essential resources, produce biomass, decompose and recycle biologically essential nutrients, and store carbon (Norkko et al., 2001; Cardinale et al., 2012). In addition, the loss of biodiversity and community stability from frequent and intense seabed disturbance also destabilises seafloor sediments, and has potentially profound effects on the ability of the seafloor to sequester carbon (Luisetti et al., 2019; Sala et al., 2021).

4.2. New opportunities in the regulatory seascape for MEBM

Our study of the planning implications uncovered that there may be new opportunities or requirements for regional councils to enhance

protection of benthic habitats in the developing regulatory seascape, as a consequence of the recognition of Māori customary rights and interests in the marine and coastal area. We suggest customary marine title holders (‘titleholder’) could have a significant role to play in the long-term regulation of activities that may affect significant biodiverse benthic habitats. This could include through the protection of wāhi tapu and titleholders imposing legally binding rāhui, as well as in the development of coastal planning provisions more generally (Makgill and Rennie, 2011). First, any process to review the NZCPS requires specific consultation with each titleholder (MCAA ss62 & 77). Second, a titleholder may give or decline permission on any grounds for an activity to which an RMA permission right applies (ss66-68).

The latter is effectively a two-step process. For instance, if an area within the territorial sea is zoned in a regional coastal plan as requiring all activities to obtain RMA consent due to the need to protect the biodiversity values identified under Policy 11 NZCPS, but a consent is granted under the RMA, then a titleholder could still decline the ability to use the consent for the activity. This could be to protect a taonga (treasured) species within a wāhi tapu area.

The nature of the prohibitions or restrictions to protect a wāhi tapu area require an evidential base; and these conditions must be set out in a customary marine title order or agreement (s78 MCAA). The titleholder can apply to vary or revoke conditions that have been granted or agreed (section 79c MCAA). The wāhi tapu prohibitions or restrictions can be made visible to government agencies by the titleholder lodging a planning document with the Minister of Fisheries NZ under section 91 MCAA, which Fisheries NZ are required to have regard to in setting sustainability measures for fish stocks or areas under section 11 FA (Scott, 2021). A planning document lodged by a titleholder under section 91 MCAA can only include matters provided for by the RMA, and that are relevant to fisheries management. This is because a planning document can include issues, objectives, and policies to promote the sustainable management of the customary marine title area’s natural and physical resources (section 85), which may include maintaining marine biodiversity following the 2019 Motiti decision.

Marine customary title claims are only just beginning to make their way through the court system. Claims have been recognised over the Titi Islands off Rakiura/Stewart Island, a small section of the Hawke’s Bay coast (Joseph et al., 2020), and in two locations in the Bay of Plenty (High Court, 2021b,c). There had been concern that the test for marine customary title under section 58 MCAA may be too onerous for Māori groups to meet given the requirement to demonstrate “no substantial interruption to the exclusive use and occupation of a specified area of the common marine and coastal area” since 1840, and that this is another example of the Crown failing to honour Te Tiriti (Joseph et al., 2020). However, a recent High Court decision resolving multiple and overlapping claims in the Bay of Plenty (High Court, 2021b), the ‘Whakatōhea’ decision, may have opened the way for titles to be issued more quickly. This is because the Court recognised that Māori tikanga enabled shared exclusivity where use by different hapū could coexist, rather than sole occupation as in the English common law.

4.3. Devolution, polycentricity and decolonisation in MEBM

Devolution and polycentricity have been recognised as key components of implementing MEBM (Berkes, 2010). In countries like Australia, Chile and Aotearoa NZ this also requires clear recognition of the significant role of Indigenous peoples as part of ongoing decolonisation efforts (Yunupingu and Muller, 2009; Macpherson et al., 2021). We consider our study points to be significant markers in how to achieve these three things as part of implementing MEBM.

The progressive recognition of customary marine titles under the MCAA may signal a much-needed significant shift in the existing regulatory seascape, although powers are currently being devolved in an *ad hoc* and uncoordinated way. In responding to this, Fisheries NZ and regional councils may become increasingly legally compelled to act in

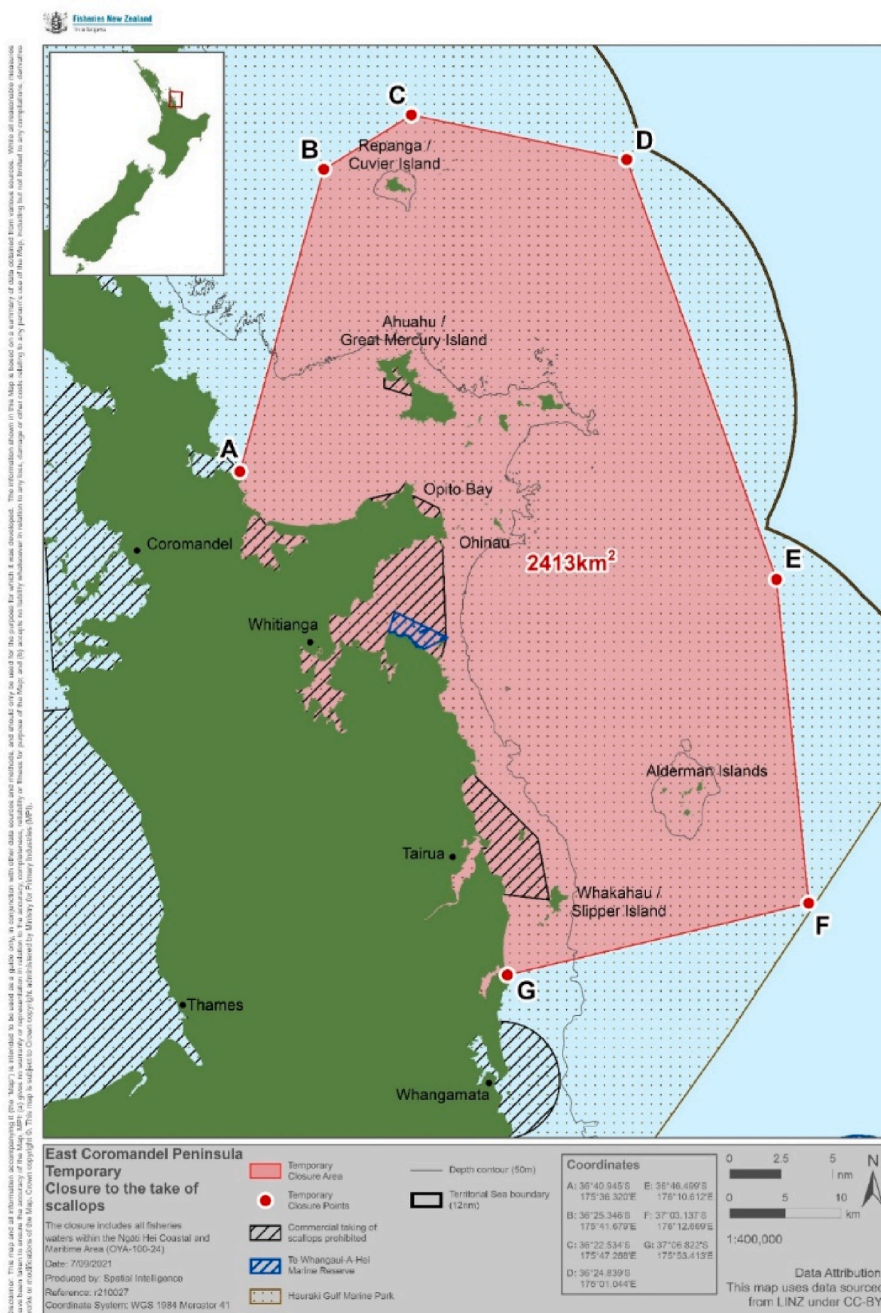


Fig. 5. Temporary closure for 2 years under s186A Fisheries Act to enable the recovery of the scallop fishery off the eastern Coromandel coast, New Zealand. Source Fisheries NZ.

more inclusive and collaborative ways, based on the partnership principles of Te Tiriti (Reid and Rout, 2020). Notwithstanding that, both the government and fishing interests are now challenging in court the scale of wāhi tapu areas in customary marine title areas (Jacobs, 2022). It is notable that court action taken by environmental and/or Māori groups, particularly since 2014, has compelled management agencies to focus on marine biodiversity issues, albeit decades after the respective enactments of the RMA and FA. This body of case law has not yet resulted in a system-wide change to the regulatory seascape or even demonstrable improvements in management by way of formal agreements between regional councils and Fisheries NZ.

Our study also shows that the regulatory seascape is performing poorly and is in a state of transition. The reforms signalled by the government (Parker, 2021) appear to require new forms of management

and governance. How those systemic arrangements are designed, nested, and devolved are key questions for the transition to MEBM (Folke et al., 2007). An important element to the success of MEBM is the need to formalise and strengthen relationships between actors (the ‘mortar’ of respectful and equitable interactions) with the institutions (the ‘bricks’) that facilitate, mandate, and resource those connections (Wondolleck and Yaffee, 2017). Macpherson et al. (2021) called for formalised and ongoing relational processes to collaboratively develop, implement, and reiterate MEBM in the face of climate change and other ocean stressors (see also McLeod and Leslie, 2009; Benson and Craig, 2017). Environmental gains from successful collaborative and participatory processes may be more enduring in complex socio-ecological systems, when those involved in formulating outcomes have a role in the ongoing implementation (Bodin, 2017; Joseph et al., 2020; Yaffee, 2020).

Should the institutional status quo survive the government's reform process, the question of adequate, secure, and ongoing resourcing will need to be addressed. Most councils seek resources through a general property rating tax, the level of which is set annually through a public consultation process. Coastal marine management competes for funding with other environmental areas, as well as local democratic functions. Only the Marlborough council has introduced targeted funding through coastal occupation charges under the RMA. This may not be an option for those councils without the sheltered harbours which host the intensive aquaculture, moorings, and other coastal structures, that Marlborough has in sufficient numbers to garner the necessary funds for coastal management under an annual user-pays levy. Customary marine title and protected rights holders are also exempt from such charges under sections 52 and 60 MCAA. The increasing inclusion by Māori in coastal and marine management as MCAA claims are progressively recognised, may mean councils and Fisheries NZ will find themselves engaging more at a local area scale with iwi, hapū and whānau over coastal management. This includes the planning documents for customary marine title areas, and any wāhi tapu areas within them. Agencies will face the challenge of increased transactional costs (Hepburn et al., 2019), but it will also be a challenge for Māori to access, and be given access to, adequate funding to participate meaningfully as a Treaty Partner under current legislative arrangements (Joseph et al., 2020).

The 'unplanned' devolution of coastal marine management may not be optimal for Indigenous people to express control over areas important to them. For example, Māori customary title holders do not have access to public funding to implement rāhui and controls on fishing, even though the exercise of their statutory rights may also apply to the general public. In addition, the ability of Māori to place rāhui outside of customary marine title areas is constrained by having to seek Ministerial consent for temporary closures under the FA, which involves public consultation, and have to be applied for every two years. However, temporary closures do not solve the underlying causes of marine life depletion. The use of temporary closures effectively keeps power over the marine environment centralised with the Crown. This may suit some parties, who argue that the Minister of Oceans and Fisheries is best placed to make decisions on what constitute adverse environmental effects from fishing and how to manage these (Jeremy Helson, Seafood NZ email communication, March 23, 2022). However, it may not enable tino rangatiratanga (tribal sovereignty) to be expressed by Māori at a local scale (Reid and Rout, 2020). This issue is currently before the Environment Court in the Northland Regional Coastal Plan hearings, where hapū aspirations for improved marine health run counter to commercial interests, including those of iwi organisations that have a financial interest in nationally-managed fisheries quota. Such tensions have occurred elsewhere, but did not reach the courts for resolution (e.g., Stevens, 2013).

5. Conclusion

Decolonisation involves a fundamental shift in societal values, and ideas about how to manage human and natural systems (Mercier, 2020). There are encouraging signs from recent public consultations over FA temporary closure applications, that not only are rāhui becoming more socially accepted, the scale of application areas are also increasing. This is evidenced by the 2364 public submissions in support, seven neutral, and ten opposed to the proposed closure over 234,000 ha off the eastern Coromandel coast (Fig. 5), that was granted in September 2021 (Fisheries NZ, 2021b). Other recent evidence of significant public support for rāhui was that all 867 submissions on the application of a hapū for the renewal of the Maunganui Bay temporary closure in 2020 were in support (Fisheries NZ, 2020c). The use of rāhui could well be a key inflection point for the introduction of ecosystem-based marine management in Aotearoa NZ (Taylor et al., 2018) as MCAA claims are settled.

Decolonisation also involves a shift in, and devolution of, power

(Mutu and Jackson, 2016), notwithstanding the desire by some interests to keep that power concentrated for the management of fisheries and marine biodiversity. The RMA was designed in 1991 to devolve decision-making power over natural resources to regional and local communities to achieve sustainable management. Given the systemic implementation problems identified in this study by regional council failures to implement coastal policies under the RMA, greater polycentricity may be needed for effective marine management to bridge scales and improve ocean health, and empower the meaningful participation of local and/or Indigenous peoples in co-management (Berkes, 1999; Bodin, 2017; Wondolleck and Yaffee, 2017, Corral and de Lara, 2017). This requires reimagining marine management and governance arrangements (Urlich et al., 2019; Joseph et al., 2020).

Devolution of regulatory powers and MEBM could emerge from the need to get the regulatory system 'right' for biodiversity in Aotearoa NZ. A key outcome of the Aotearoa NZ Biodiversity Strategy by 2050 is that: "Ecosystems, from mountain tops to oceans depths, are thriving" (NZ Government, 2020:p43). Achieving this will require both a focus on relationships to share skills, knowledge, expertise and resources (Macpherson et al., 2021), and the evolution of a shared bi-cultural tikanga to meet the challenges of climate change.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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