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**A review of te ao Māori  
perspectives of marine scales  
and where these are impeded by  
contemporary management**

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September 2023

**Report for the Sustainable Seas National Science Challenge project *Scale and EBM*,  
(Project 4.4).**

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**Date of publication**

October 2023

**For more information on this project, visit:** <https://www.sustainableseaschallenge.co.nz/our-research/scale-ebm/>



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Our vision is for Aotearoa New Zealand to have healthy marine ecosystems that provide value for all New Zealanders. We have 60+ research projects that bring together around 250 scientists, social scientists, economists, and experts in mātauranga Māori and policy from across Aotearoa New Zealand. We are one of 11 National Science Challenges, funded by the Ministry of Business, Innovation & Employment.

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*Cover image: Assessment of mahinga mātaimai health, Waitaha (Photo: Ani Kainamu, 2014).*

## Acknowledgements

Papaki ana ngā tai o mihi ki ngā hapū, ki ngā iwi o Te Ika a Maui me Te Waka o Aoraki, inarā, koutou ngā kaitiaki a ō koutou rohe whenua, rohe moana. He kohikohinga kōrero noa tēnei e hāpai ana i ngā mahi hei painga mō te taiao. We would like to acknowledge each of the whānau, hapū and iwi mentioned within this literature review.

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## Executive summary

Ecosystem Based Management (EBM) and Te Tiriti o Waitangi are central to realising the overall objectives within the Sustainable Seas National Science Challenge ('the Challenge'). What we observe, how we predict ecosystem responses and address unintended consequences is dependent on scale. However, the choice of scale is not politically neutral; the selection may intentionally and unintentionally privilege certain groups (Reid et al. 2006). Tangata Whenua, for instance, must currently work within the constraints of Western science and policy systems (Mercier et al. 2011), which has minimised their ability to fulfil kaitiakitanga in marine and freshwater environments (Clapcott et al. 2018).

The 'Scale and EBM' project (April 2022 – December 2023) within Theme 4 'Enabling EBM Practices' focuses on improving understanding and communication of scale-dependencies for EBM. Mātauranga-a-iwi, mātauranga-a-hapū have evolved across centuries of extensive and intimate relations between Māori and their whenua/moana, and thus should be essential to the realisation of EBM.

This review draws on published and relevant unpublished literature to provide examples of whānau, hapū and iwi perspectives relating to scale, their marine practices, and their marine management aspirations. The review explores where hapū and iwi marine practices are impeded and draws on a range of examples from Aotearoa NZ's marine and freshwater context to demonstrate how te ao Māori perspectives of scale are influencing a broader range of environmental management outcomes for the benefit of the environment, ecosystems and the communities within.

'Scales' are inherent within a wide variety of te ao Māori concepts associated with the natural environment. This review explores the attributes implicit in four interrelated scales which have both spatial and temporal components:

- He taiao tātou – reflects people as part of the ecosystem (i.e., the indivisibility between Tangata and whenua, including moana).
- He mana whenua, he mana moana – acknowledges whānau/hapū authority and relationships (i.e., who are responsible for local/sustainable environmental outcomes).
- Ki uta ki tai – reflects the connectivity between Tangata and whenua (including moana), and the connectivity between the flow of water from the sky, across the land and out to sea.
- Hawaiki me Te Moana-nui-a-Kiwa – reflects the connectivity of Indigenous Peoples and ecosystems across the Pacific Ocean.

In their simplest form, these scales are somewhat recognisable to contemporary managers as covering local, regional, national and international spatial areas. However, there are many nuances and micro/macro scale descriptors when Māori use certain terms (such as waka, marae, whakapapa) to reflect more in depth mātauranga – also expressed through concepts such as tapu, mauri, rāhui, mana, noa, which draw on the physical and metaphysical realms, and – as activated via shared, but locally distinct, principles such as kaitiakitanga.

Te Tiriti o Waitangi ensures that the Crown has a duty to actively protect whenua Māori including fisheries and other taonga and enables Māori to protect these taonga. Within te ao Māori, taonga includes mātauranga Māori and tikanga Māori. However, over time a plethora of legislation have successfully dismantled Māori rights and interests, and restricted customary practices and tribal economies (e.g., Waitangi Tribunal 1988; Jackson 2013), the impacts of which are still being widely felt today. This review briefly describes areas where Māori environmental management outcomes are being undermined by a complexity of issues, including (but not limited to) jurisdictional boundaries, inequitable power sharing, misuse of tikanga Māori by non-Māori (e.g., rāhui), perceived inferiority of mātauranga, requirements for conventional science, legacy impacts/effects, and navigation of lengthy bureaucratic processes.

EBM provides an opportunity to address deficiencies in contemporary marine management approaches for the benefit of our environment, Tangata Whenua and future generations. Being anchored by Te Tiriti o Waitangi, including people as part of the environment, drawing on centuries of extensive/intimate mātauranga (developed within rohe whenua/rohe moana), reflecting on past/present/future effects (i.e., multiple temporal/intergenerational scales), and reflecting the connectivity and interdependencies of ecosystems and the multiple species they support (beyond current Crown jurisdictions) – are key attributes that will better reflect scale and scale-dependencies from te ao Māori perspectives in future visualisation tools (i.e., the next phase of this project).

## Scope of this review

The Sustainable Seas National Science Challenge ('the Challenge') is developing knowledge, tools and resources for ecosystem-based management (EBM) in Aotearoa. EBM is a holistic and inclusive way to manage marine environments and the competing uses for, demands on, and ways New Zealanders value them.

EBM is promoted as a dynamic approach, focussed on understanding and managing ecosystems across a range of organisational, spatial, and temporal scales (e.g., Long et al. 2015). However, despite the importance of scale, and multiple disciplines that are involved in collaborating to achieve the Challenge objectives, only rarely is scale-dependency in different disciplines and the interactions between them explicitly stated and brought into play as affecting both the decision-making process and its success (Ellis et al. 2022). This leaves gaps in our ability to fully understand how EBM can be achieved across a variety of scales and decision-making contexts.

The 'Scale and EBM' project (April 2022 – December 2023) within Theme 4 'Enabling EBM Practices' focuses on improving understanding and communication of scale-dependencies for EBM. Mātauranga-a-iwi, mātauranga-a-hapū have evolved across centuries of extensive and intimate relations between Māori and their whenua/moana, and thus should be essential to the realisation of EBM. The following report considers 'scale' from various te ao Māori-informed perspectives to provide examples of:

- Māori principles and values that establish and reinforce whānau, hapū and iwi identity, and their responsibilities and rights to manage and use the marine environment,
- te ao Māori concepts associated with the natural environment that are inclusive/reflective of various spatial and temporal scales, and
- where hapū and iwi tikanga and mātauranga are impeded by contemporary marine management scales.

The findings from this review will inform the development of visualisation tools that better reflect scale and scale-dependencies within EBM decision-making processes.

## Approach

This review draws on published and relevant unpublished literature (including client reports, journal papers, Iwi/Hapū Environmental Management Plans, Waitangi Tribunal reports, settlement legislation) to provide examples of whānau, hapū and iwi perspectives relating to scale, their marine practices, and their marine management aspirations.

The review then outlines a range of contemporary marine management approaches that have sought to accommodate Māori rights and interests and explores where hapū and iwi marine practices are impeded.

It draws on a range of examples from Aotearoa's marine and freshwater context to demonstrate how te ao Māori perspectives of scale are influencing a broader range of environmental management outcomes for the benefit of the environment, ecosystems and the communities within.

In compiling this review preference was given to publications authored or co-authored by Māori researchers and/or where the outcomes were clearly driven by iwi/hapū/marae community expectations.

A glossary of Māori terms used in this report is provided in Appendix 1.

## Literature Review

### Terminology

In this section we provide brief explanations for key Māori terms used in this report. While there is no 'one' perspective or mātauranga within te ao Māori, there are principles and values that establish and reinforce whānau, hapū and iwi identity, and their responsibilities and rights to manage and use the marine environment.

In regard to the future improvements needed to Aotearoa NZ's marine management systems, this review does not seek to conflict with, replace or supersede the distinct perspectives of iwi and hapū and any respective outputs, actions, or initiatives they are seeking to inform their decision-making processes. We advise that further discussions are needed with hapū and iwi to better understand the use of the terms used in this report within each place-based context to support mātauranga ā-hapū and mātauranga ā-iwi.

#### *Tikanga*

Tikanga, in its many forms, are fundamental protocols towards sustaining, enhancing, or correcting towards balance. Tikanga has many forms, and is employed and adapted according to context, constraints, and purpose. As shared by the late Moana Jackson (Jackson 2020):

*"In simple terms, tikanga is a values system about what 'ought to be' that helped us sustain relationships, and whakatika or restore them when they were damaged. It is a relational law based on an ethic of restoration that seeks balance in all relationships, including the primal relationship of love for and with Papatūānuku. Because she is the Mother, we did not live under the law but rather lived with it, just as we lived with her".*

Therefore, in the context of this review, 'scale' is inclusive of multiple relationships – past, present and future. Further, rather than 'managing' our environments, tikanga supports our relationships and actions with and within our environment/ecosystem(s).

#### *Mātauranga Māori*

Mātauranga Māori is specific to Tangata Whenua and a taonga protected by Te Tiriti o Waitangi. Mātauranga Māori is a relatively new terminology to explain to non-Māori, especially researchers within academia, the fundamental epistemology and validity of knowledge that is founded by Tangata Whenua. Each hapū and iwi have their own mātauranga which are, for example, specific and relative to their environmental contexts, experiences, observations and understandings of their interactions and patterns of cultural use (e.g., Wakefield and Walker 2005; Kitson et al. 2014; Kainamu-Murchie et al. 2018; Maxwell et al. 2018; Crow et al. 2020).

Mātauranga Māori, mātauranga ā-iwi/ā-hapū, is embodied in many forms including pūrākau, whakapapa and pepeha, which include genealogy and geo-spatial references (e.g., Beattie 1994; Williams 2001; Wehi 2009; Harmsworth and Awatere 2013). Mātauranga ā-iwi/ā-hapū encompasses metaphysical and esoteric forms of knowing (Marsden and Royal 2003; Mead



2003; Royal 2009a and 2009b; Roberts 2013; King 2018) and includes the pursuit of knowledge and comprehension of te taiao following a systematic methodology based on evidence, and incorporating culture, values, and world views (Hikuroa 2017). Kitson et al. (2018) further explains that it is important to understand that:

*“mātauranga Māori is a dynamic and evolving knowledge system, has both qualitative and quantitative aspects, and includes the processes for acquiring, managing, applying and transferring that body of knowledge”.*

Further, mātauranga Māori includes knowledge thought to be lost and now currently under recovery, with each new generation adding, subtracting or amending the knowledge. Of relevance to this review, Ataria et al. (2018) explains how research and innovation contributes:

*“mātauranga Māori has a past, a present and a future – meaning that this Māori knowledge system is continually being used, adapted and incorporated into people’s lives. This allows for new, innovative ideas and practices including that evolving from fresh discoveries and research. Rather than being cast aside and replaced by a different system of knowledge, mātauranga Māori re-establishes itself both before and after colonialism with each new generation adding, subtracting or amending the knowledge”*

### **Whakapapa**

Whakapapa recognises our relationships and connections with each other, the creation, the evolution of the universe and all within it. It considers the living and non-living relations. Within this there is an innate sense of care and responsibility for all of those in this whakapapa (Salmón 2000). Therefore, whakapapa encapsulates multiple scales in space and time and emphasises the familial connection of Māori with individuals (both animate and inanimate), the environment, and the universe beyond (e.g., Tomlins-Jahnke and Forster 2015); it includes the shaping of ecology with culture, and vice versa.

### **Kaitiakitanga**

Kaitiakitanga can be defined as the intergenerational exercise of customary custodianship, in a manner that incorporates spiritual matters, by those who hold mana whenua/mana moana status for a particular area or resource. Kaitiakitanga encompasses the inherent rights and responsibilities of mana whenua to protect/sustain a particular area or resource for the benefit of future generations.

Kaitiakitanga is practiced through an elaborate system of tikanga, including guiding values and concepts that include tapu, mauri, rāhui, mana, noa, and wairua (e.g., Harmsworth and Tipa 2006). Reciprocity across all these elements ensures accountability, sustainability, and wellbeing of the ecosystem (inclusive of people).

### **Te ao Māori perspectives of scale**

‘Scales’ are inherent within a wide variety of te ao Māori concepts associated with the natural environment. One of the most well cited examples is *ki uta ki tai* (e.g., Kaupapa Taiao 2003), or *ma uta ki tai* (e.g., Henwood & Henwood 2011). Multiple scales are implicit within this concept including, but not limited to, the connectivity between Tangata and whenua (including moana), and the connectivity between the flow of water from the sky, across the land (*ki uta*) out to sea (*ki tai*) and across the great ocean (Te Moana-nui-a-Kiwa).

The following scales, including connectivity with people/mana whenua/mana moana, are further explored below:

- He taiao tātou – reflects people as part of the ecosystem (i.e., the indivisibility between Tangata and Whenua, including moana).
- He mana whenua, he mana moana – acknowledges whānau/hapū authority and relationships (i.e., who are responsible for local/sustainable environmental outcomes).
- Ki uta ki tai – reflects the connectivity between Tangata and whenua (including moana), and the connectivity between the flow of water from the sky, across the land and out to sea.
- Hawaiki<sup>1</sup> me Te Moana-nui-a-Kiwa – reflects the connectivity of Indigenous Peoples and ecosystems across the Pacific Ocean.

In their simplest form, these scales are somewhat recognisable to contemporary managers as covering local, regional, national and international spatial areas. However, there are many nuances and micro/macro scale descriptors when Māori use certain terms (such as waka, marae, whakapapa) to reflect more in depth mātauranga – also expressed through concepts such as tapu, mauri, rāhui, mana, noa, which draw on the physical and metaphysical realms, and – as activated via shared, but locally distinct, principles such as kaitiakitanga.

### *He taiao tātou*

As expressed above, relationships in te ao Māori encompass human relationships with each other, with the natural environment, and with the metaphysical realm. Tangata Whenua trace their origins back to their ancestral homelands, which is specific (e.g., tribally) and extensive (e.g., spatial-temporally), covering the celestial/terrestrial/freshwater/marine realms, and island nations across the Pacific Ocean.

Whakapapa encapsulates and emphasises the familial connection of Tangata Whenua with the environment (Tomlins-Jahnke and Forster 2015). It is through whakapapa that Tangata Whenua are inherently connected to their whenua/moana, with these ancestral and tribal landscapes acting as a repository of mātauranga and tikanga across generations. The interconnectedness between the physical landscape, tūpuna, events, occupation over time, and practices remain critical to cultural identity and sense of place (e.g., Panelli and Tipa 2007, Harmsworth and Awatere 2013).

As a practice, whakapapa informs ‘how we stand’ in relation to our moana, our wai, with whānau and with each other. In this way whakapapa captures the genealogical dynamic of relationships encompassed in the physical, emotional, and spiritual connections and scales (Walker et al. 2022).

Rereata Makiha is a respected mātanga of mātauranga who has long advocated for the validity and revitalisation of hapū and iwi environmental systems. In a 2020 interview, he reminds us *he taiao tātou*, literally meaning we are the/this ecosystem. For example (Mākiha 2020):

*“Ko au te awa, ko te awa ko au. Ko au te whenua, ko te whenua ko au. Kua e tū wehewehe i te taiao, he taiao tātou.”*

*Translation: I am the river, the river is me. I am the land, the land is me. Do not exclude oneself from the natural environment, as we are the environment.*

This perspective is holistic and is anchored within intimate and extensive relations. *He taiao tātou* also reminds us how intimate these relational dependencies are on each other, i.e., the

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<sup>1</sup> Hawaiki can be defined as the ancient homeland/place from which Māori migrated to Aotearoa.

well-being of Tangata Whenua is directly related to the health of the natural environment, which is also why whānau and hapū hold decision-making responsibilities.

### *He mana whenua, he mana moana*

In very simple terms, mana whenua/mana moana refers to the territorial authority or jurisdiction usually held by the hapū of an area. More specifically it refers to the whānau who have the closest physical and genealogical association with specific area(s). The whānau and hapū with these associations are referred to as mana whenua and mana moana. This/these whānau have primary rights ahead of those from the wider hapū/iwi (Mutu 2020).

Mana moana is the equivalent to mana whenua as it applies to the sea and its associated environments, and the area to which this authority applies is often referred to as rohe moana (Mutu et al. 2017). In relation to spatial scales, the two forms of mana overlap considerably since the land extends well into the sea, while the sea's effects impinge some distance inland (Mutu et al. 2017).

The rights and responsibilities reside with the local group/collective rather than individuals (Best 1929; Guth 2001; Williams 2004). Most importantly, the rights and authority of mana whenua and mana moana remain theirs regardless of Western legal ownership, as explained by Mutu (2020):

*“Vesting Western legal title in another person does not remove mana whenua from a whānau and the responsibilities of the whānau and hapū to uphold mana whenua and prevent the desecration and despoliation of their land remains”.*

The connection between *he taiao tātou* and *he mana whenua, he mana moana* is exemplified within a quote from Dr Apirana Mahuika in Nga Hapu o Ngāti Porou, Mana Moana, Foreshore and Seabed Deed of Agreement (Te Runanganui o Ngāti Porou 2016):

*“Whanau and hapu of Ngati Porou recognise and respect the boundaries and territories of each kin group and therefore their rangatira rights over these regions. In spite of legislation and the raupatu of our lands over successive governments and generations, for Ngati Porou, mana tuku iho never dies but it endures forever. The same applies to te takutai moana.*

*E Kore te Mana Iwi e Memeha (Iwi Mana never dies).”*

Ultimately it is the collaborative and unified objectives of various socio-cultural scales (whānau, hapū, hāpori, iwi) who contribute to the wellbeing of place, and maintain balance between place and people.

### *Ki uta ki tai*

In Aotearoa and Te Waipounamu, whānau, hapū and iwi have been calling for more holistic considerations of ecosystem health and connectivity in environmental management, e.g., *ki uta ki tai* (e.g., TAMI 2008; Tipa 2010) and *ma uta ki tai* (Henwood and Henwood 2011). *Ki uta ki tai* can be explained as a paradigm and an ethic (Figure 1) (Kaupapa Taiao 2003, TAMI 2008). It acknowledges the connectivity of scales ‘from mountain to the sea’ as well as the reciprocal relationships between people and their ancestral environments (TAMI 2008). Kaupapa Taiao (2003) explains:

*“It’s a way of understanding the natural environment, including how it functions, how people are related to it and how it can be looked after appropriately... Ki uta ki tai gives reference to the Ngāi Tahu understanding of the natural world and the belief that all things are connected – a belief shared by many other iwi and indigenous people... ki*

*uta ki tai* is also a modern management framework that involves the creation of a number of tools, such as natural resource management plans, monitoring and reporting processes and resource inventories and their associated strategies to address the continuing challenges and threats faced by all aspects of the natural environment from the mountains to the sea – *ki uta, ki tai...*”

Thus, *ki uta ki tai* includes holistic understandings of aquatic ecosystems and how the health and wellbeing of the people is intrinsically linked to that of the environment. *Ki uta ki tai* reflects that we belong to the environment (i.e., *He taiao tātou*) and are only borrowing the resources from generations that are yet to come. It is considered our duty (especially to support *mana whenua/mana moana*) to leave the environment in as good as or even better condition than received from our *tūpuna* (TAMI 2008).



Figure 1: Ngāi Tahu perspective of *ki uta ki tai* includes land-to-sea connectivity of the environment, including the atmosphere, freshwaters, coasts and ocean (Source: Kaupapa Taiao 2003).

### Hawaiki me Te Moana-nui-a-Kiwa

Hawaiki and Te Moana-nui-a-Kiwa are integral to te ao Māori. This encompasses one of the largest spatial, temporal, spiritual and epistemological cultural landscapes. For example, Ngāti Kahungunu refers to *ki uta ki tai* as the passage of waters from their source, through a network of tributaries onto lower floodplains, to the interface with the coast and out to the sea, and out to Hawaiki (HBRC 2013). Hawaiki is an important source of *mātauranga, tikanga*, that have been handed down through generations. As expressed in the following whakataukī (Mead and Grove 2003):

“Ehara i te mea poka hou mai, nō Hawaiki mai anō”.

*It is not something of recent origin but a tradition from Hawaiki.*

It also connects Tangata Whenua across the Pacific and honours whakapapa and tikanga to ensure the health and wellbeing of our marine systems from inland out to the great expansive ocean, Te Moana-nui-a-Kiwa. *Hawaiki* and *Te Moana-nui-a-Kiwa* are also important scales to consider for our native taonga who migrate great distances as part of their life cycle such as various fish (e.g., tuna, mangō), mammals (e.g., tohorā) and birds (e.g., tītī, amokura, kuaka). Intimate relationships with these taonga are woven into pepeha that are unique to hapū and iwi.

## Enablers or impediments of Māori marine management scales?

Te Tiriti o Waitangi ensures that the Crown has a duty to actively protect whenua Māori including fisheries and other taonga and enables Māori to protect these taonga. Within te ao Māori, taonga includes mātauranga Māori and tikanga Māori. The following acts intend to protect the rights, interests, critical roles (and in some cases redress) of Tangata Whenua within the marine environment: Treaty of Waitangi (Fishing Claims) Settlement Act 1992, the Māori Fisheries Act 2004, the Māori Commercial Aquaculture Claims Settlement Act 2004, the Marine and Coastal Area (Takutai Moana) Act 2011 (abbreviated as MCAA), and the Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019.

Despite this, Māori rights and interests have been dismantled and redefined overtime through various processes which have restricted customary practices and undermined tribal economies the impacts of which are still being widely felt today (e.g., Waitangi Tribunal 1988; Jackson 2013, Kainamu 2023). We provide examples of where mātauranga and tikanga are enabled or impeded by contemporary marine management: Customary Management Areas; Rāhui and temporary closures; Fisheries regulations; and Degraded marine environments. Although iwi/hapū experiences are on-going and relatively recent, we also provide some commentary on customary marine title as supported via the Marine and Coastal Area (Takutai Moana) Act 2011.

### *Customary Management Areas*

Customary Management Areas (CMAs) are promoted by the Crown to support hapū and iwi customary governance of fisheries within their rohe. The Fisheries Act 1996 provides for the establishment of CMAs. The types of CMAs (Figure 2) and associated spatial area tools include:

- Mātaitai reserves – are reserves that recognise and provide for traditional fishing through local management. They usually do not allow commercial fishing and may have bylaws in place affecting recreational and customary fishing.
- Taiāpure – are local fisheries of special significance, which may have additional fishing rules, are estuarine or coastal areas that are significant for food, spiritual, or cultural reasons. They allow all types of fishing, may have additional fishing rules, and are managed by local communities.
- Temporary closures – are areas that can be temporary closed to fishing or certain fishing methods. These are issued under sections 186A or 186B of the Fisheries Act 1996.
- Fisheries bylaw areas – changes to fisheries management rules made by Tangata Whenua or tangata kaitiaki/tiaki (guardians) for their settlement area or mātaitai reserve.

Many CMAs have been implemented across Te Ika-a-Maui and Te Waipounamu in the past decade (Figure 2). One of the incentives to undertake the arduous and divisive process of establishing a CMA is the ability to activate the legal temporary closure tool (e.g., when fishery

stocks have been locally depleted by recreational and commercial fishers), which can't be applied without a CMA, and has legal teeth when compared to rāhui (see section below).

There are numerous examples of how CMAs are not providing for the needs of whānau, hapū, iwi and their taonga/marine ecosystems. For example, CMAs have failed to deliver meaningful governance, timely responses, or localised and ecologically relevant solutions (McCormack 2011; Jackson 2013; Gnanalingam and Hepburn 2015; van Halderen 2020).



Figure 2: Customary Fisheries Management Areas (Source: <https://www.mpi.govt.nz/>).

The purported benefits of hapū and iwi CMA management is confounded by inequitable power balances, where ultimately the effectiveness of CMAs are constrained by the wider governance structures that encompass them (Jackson 2020; Bennett-Jones et al. 2022). The Crown holds the authority to establish a CMA as well as decision-making (i.e., to implement a closure, to renew a closure, to establish bylaws) within a CMA (Jackson 2013; Gnanalingam and Hepburn 2015). The taiāpure CMA tool in particular, has been found to be ineffective in its objectives to make ‘better provision for the recognition of rangatiratanga’ and instead continues to erode Māori fishing rights (Jackson 2013).

Establishing taiāpure can take a tremendous effort. For example, it had taken 15 years for Kāti Huirapa ki Puketeraki with their community to establish the East Otago Taiāpure (Bennett-Jones et al. 2022). The process included the establishment of the taiāpure/local fishery, appointment of a management committee, and introduction of necessary regulation within the Fisheries Act 1996 (Bennett-Jones et al. 2022). This lengthy process is a significant barrier to responding to the fisheries issues and pressures that hapū/rūnaka are trying to alleviate.

In addition to the above barriers, CMAs privilege Western science and bureaucracy (Jackson 2013; Gnanalingam and Hepburn 2015; Bennett-Jones et al. 2022). While the provisions aim to ‘provide for the use and management practices of Tangata Whenua’ the legislation in effect reduces the role of Tangata Whenua to that of an advisory body (McCormack 2011). For example, although the East Otago Taiāpure Management Committee has a role to play in managing the fishery, it has no power to protect the habitats that support fisheries (Hepburn et al. 2010).

### *Rāhui and temporary closures*

The term rāhui is often used within marine management creating ambiguity between those that understand rāhui from te ao Māori perspective to those who are referring to temporary closures through Section 186A and 186B of the Fisheries Act 1996<sup>2</sup>.

- Rāhui (verb) (-ngia, -tia): to put in place a temporary ritual prohibition, closed season, ban, reserve. One example is that a rāhui was placed on an area, resource or stretch of water as a conservation measure or as a means of social and political control for a variety of reasons.
- rāhui (modifier): reserved, restricted access, restricted.
- rāhui (noun): warning sign that a rāhui is in place, sanctuary, resource reserve, temporary prohibition.

Rāhui represents prohibition protocols that are activated alongside a suite of practices imposed by mana whenua. These are applied to the environment to ensure ecosystem wellbeing, sustainability, and/or people’s safety. For instance, a historical occurrence of rāhui was practiced by Muriwhenua iwi in alignment with their intricate environmental system (i.e., tikanga and mātauranga) (Waitangi Tribunal 1988). This system included tohu o te taiao (ecosystem indicators) and the maramataka (lunar calendar), which marked the fishery season and was upheld by strict consequences (Waitangi Tribunal 1988).

#### *Temporary Closures (Section 186A/B prohibition)*

The Crown created the provisions within Section 186A and 186B of the Fisheries Act 1996 with the intent to respond to localised depletion and to provide for the use and management practices of Tangata Whenua in exercising their non-commercial fishing rights. The Crown has

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<sup>2</sup> It is also noted here that there is ambiguity in the use of mātauranga from a te ao Māori perspective, which this report does not go into detail.

incorrectly defined rāhui to mean ‘temporary closures’ especially in relation to fisheries management. It is also commonly referred to within marine management discussions by local and national authorities (e.g., Fisheries NZ), fishery science working groups (e.g., including commercial fishers), and academia (including researchers within the Challenge).

The temporary closure provisions within Section 186A and 186B of the Fisheries Act 1996 does not consider the needs of particular species to support their recovery from various pressures beyond fishing. Temporary closures have fixed periods and specific areas where they can be applied, but do not necessarily respond to the spatial and temporal scales required to support a species (nor interdependent species). For instance, temporary closures have a fixed period of two years after which this type of closure requires further applications per renewal, and for a limited number of renewals (Gnanalingam and Hepburn 2015). One such instance is where a temporary closure implemented in 1998 expired in 2006, after the Ministry of Fisheries advised the iwi that s186A 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 (Urlich et al. 2022).

Temporary closures can only be applied within Crown approved CMAs (Figure 2). The process of establishing a closure often requires the application of Western science and final decision-making power is vested with the Crown (Gnanalingam and Hepburn 2015). The way in which the decision-making power is vested in the Crown is considered inconsistent with the original purpose of these provisions (Gnanalingam and Hepburn 2015).

#### *Rāhui vs temporary closures (Section 186A/B prohibition)*

Temporary closures have legal teeth when compared to rāhui which are voluntary (McCormack 2011). An analysis of temporary closures over a period of time (1998-2021) found the primary reason given by applicants for temporary closures was to support customary rāhui (Urlich et al. 2022).

Ecological dependencies are important considerations within mātauranga and tikanga. By defining a time limit for temporary closures, legislators have failed to account for the ecology of many of the species targeted for protection that require longer periods for recovery (Gnanalingam and Hepburn 2015). While six temporary closures had been renewed at least once, the consistent reason for ongoing renewals was the slowness of recovery of fisheries and habitats (Urlich et al. 2022).

A recent study evaluated whether rāhui or temporary fishing closures provide for rangatiratanga, and the right to exercise kaitiakitanga (van Halderen 2020). They found that voluntary rāhui in Whareponga was adaptable and provided for rangatiratanga but was not protected by the law (van Halderen 2020). In comparison, the temporary closure in the East Otago Taiāpure, although protected by law, was inflexible and did not provide for full rangatiratanga (van Halderen 2020).

#### *Fisheries regulations*

Kaitiakitanga is exercised through the authority embedded in rangatiranga (Jackson et al. 2017). Fisheries regulations can impede rangatiratanga and kaitiakitanga at local, regional and national scales. Nationally or regionally applied one-size-fits-all approaches to marine management fail to account for this variability, and when coupled with fishing pressure this can result in serial depletion and localised extinctions (Gnanalingam et al. 2021).

There are many cases where practicing kaitiakitanga has risked/resulted in a legal offence. In one example, during November 2016, Kaikōura experienced a magnitude 7.8 earthquake



which caused an uplift of the seabed by as much as 6 m along the fault plain. The sudden uplift caused crabs, fish, crayfish, and pāua to be exposed over the uplifted ocean floor (Clayton 2016). Initially, Crown fisheries officers had threatened anyone providing relief to sea life with a fishing regulation offence (Glassey 2019). This highlights the barriers faced by mana whenua/mana moana when they are responding urgently as kaitiaki to protect their rohe moana and taonga such as pāua. It also highlighted that the welfare of marine species such as pāua was not considered by the Crown (Glassey 2019). Eventually, MPI/Fisheries NZ helped to monitor the fishery relief efforts (Glassey 2019) and, together, Te Rūnanga o Kaikoura and Kaikoura pāua relocation volunteers saved more than 60 tonnes.

However, there are also situations where fisheries regulations developed by iwi better respond to the life cycle needs of species and seek to improve fishery outcomes. For example, tuna are significant taonga to Waikato Tainui and to support the wellbeing of tuna populations they have implemented six bylaws in collaboration with the commercial eel sector and the wider community. The Fisheries (Declaration of Waikato-Tainui Fisheries Area Bylaws) Notice 2014<sup>3</sup>, supports the protection of tuna within Waikato, and includes the following regulations:

- Prohibiting incidental catch and release of tuna at specific weights (i.e., >2 kg), and female longfin that are in migratory morphological phase (unless for transfer and release purposes).
- Seasonal closure of commercial harvest of eels in specific streams and rivers.
- Minimal and maximum weight for commercially harvested eels.
- Prohibiting the taking of migratory female longfins.

We understand that this, and the Te Arawa Lakes (Fisheries) Bylaws 2020 (Notice No. MPI 1123), are some of the few bylaws with a focus on the ecological dependencies of 'Ngā Taonga Ika' as determined by iwi. Similar fishery protection measures have been difficult to activate long-term within the marine space (e.g., see the fishery temporary closures limitations).

### *Degraded marine environments*

Pollutants and degraded marine environments impact Māori identity and wellbeing, and their engagement with the marine environment at a range of spatial and temporal scales (sometimes intergenerational). Many of our estuaries and coastal areas are suffering from recurring poor water quality events, leading to restrictions on human contact and/or food consumption, sometimes lasting many years (e.g., PCE 2020).

For example, the input of sewage into the Avon-Heathcote Estuary and Te Whakaraupō (Lyttleton Harbour) violates the principles and practicalities of mahinga kai gathering and management (Boyd 2010). By the early 1990s very little food was gathered from Te Whakaraupō due to effluent discharges and sedimentation (Tau et al. 1992). Mahinga kai collection ceased and a rāhui was placed on the Avon-Heathcote Estuary (Deely 1992). Of relevance to this review is the lack of consideration towards what and how food safety is measured (and at what scale) to determine an area and/or species to be safe or unsafe for mahinga kai. Again, current approaches do not consider te ao Māori perspectives, mātauranga, tikanga or wellbeing (e.g., the appropriate scales and approaches for assessing ecosystem health and mahinga kai safety).

### *Customary marine title*

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<sup>3</sup> <https://www.mpi.govt.nz/dmsdocument/55501-Fisheries-Declaration-of-Waikato-Tainui-Fisheries-Area-Bylaws-Notice-2014-Notice-No.-MPI-319>

The Marine and Coastal Area (Takutai Moana) Act 2011 (MACA) and Ngā Rohe Moana o Ngā Hapū o Ngāti Porou Act 2019 (the Takutai moana agreement) provide for the recognition of the customary marine interests of whānau, hapū and iwi in the common marine and coastal area since 1840. This Act replaced the Foreshore and Seabed Act 2004 and neutralised the ownership issue by declaring that '[n]either the Crown nor any other person owns, or is capable of owning, the common marine and coastal area' (Ruru 2022).

Applications for a High Court order for recognition of protected customary rights and customary marine title had to be filed by the statutory deadline of 3 April 2017. In 2022, there were 205 active MACA applications for combined protected customary rights and customary marine title, and two applications for customary marine title were successful (Ruru 2022).

Customary marine title is one way the customary interests that one or more whānau, hapū and iwi have in a specific part of the common marine and coastal area can be recognised. Public access, recreational use, fishing and navigation are unaffected by customary marine title, except for some lawful restrictions, including for the protection of wāhi tapu. If the responsible Minister recognises the customary marine title, that recognition is given effect through an Act of Parliament.

When assessing a customary rights area, the court must act in accordance with tikanga. It was found that higher courts are demonstrating more sophisticated attempts to respect Māori laws and property interests (Ruru 2022).

Contrary to this, the Waitangi Tribunal accorded an inquiry into the MACA finding it in breach of Treaty rights. For instance, within Stage 1 of the inquiry (Waitangi Tribunal, 2020) the Tribunal found that some aspects of the procedural and resourcing arrangements supporting the Act breached the Treaty and prejudicially affected Māori. Within Stage 2 (Waitangi Tribunal, 2023), the Tribunal finds the claimants have been, and will likely continue to be, prejudiced by aspects of the Act that breach Treaty principles. Overall, the MACA does not sufficiently support Māori in their kaitiakitanga duties and rangatiratanga rights and fails to provide a fair and reasonable balance between Māori rights and other public and private rights (Waitangi Tribunal, 2023). The Tribunal further recommends the Crown make targeted amendments to the Act, to give effect to the Treaty principles and alleviate the existing or likely prejudice to Māori (Waitangi Tribunal, 2023).

## Discussion

This review has provided examples of where mātauranga and tikanga related to recovery of marine ecosystems are impeded by contemporary management scales. Generally, jurisdictional boundaries prevent management of a socio-cultural landscapes as a whole system, including marine ecosystems. The arbitrary lines of contemporary management have limited effective ecosystem connectivity and functioning, but it has also interrupted kaitiakitanga (and consequently mātauranga) through severing Tangata with Whenua (including Moana). The choice of management approach and scale at which they are activated is not politically neutral, and privilege certain groups (Reid et al. 2006).

Tikanga and mātauranga have long been subordinate to Western science, law and epistemology especially in marine environmental management. It has long been acknowledged

that the decision-making approaches and power in our current marine management system are inequitably held by the Crown (e.g., Jackson 2013) and has systematically eroded mātauranga (and associated tikanga) via a long history of colonial policies (e.g., Tohunga Suppression Act 1907). We have outlined some of the constraints that hapū and iwi CMA committees continue to face as they endeavour to operate within the confines of broader legal frameworks which include conflicting worldviews, inequitable power sharing, perceived inferiority of mātauranga and tikanga, requirements for conventional science, and navigation of lengthy bureaucratic processes (Bennett-Jones et al. 2022). To overcome this impactful legacy, co-governance by Treaty of Waitangi partnerships to ensure equitable representation of mātauranga and tikanga, which in turn influences scale(s), will be central to the realisation of EBM (e.g., Joseph 2022, Reid and Rout 2020).

Understanding/representing scale from te ao Māori perspectives is a significant step towards more inclusive and holistic management of marine ecosystems, and addressing the multitude of pressures they are facing. For generations Māori have emphasised the necessity of considering the environment in its entirety, with people as part of the ecosystem. This review provides examples of the aspirations of Māori for the appropriate management of aquatic ecosystems that is not restricted to boundaries set by the Crown and recognises the interconnectedness of the hydrological and ecological ecosystems (i.e., groundwater, streams, rivers, estuaries, marine environs, fisheries, vegetation, atmosphere).

As explained in this review, te ao Māori perspectives of scale do not operate in isolation, multiple scales interact with each other (e.g., waka, marae), and reflect shared principles and approaches (e.g., whakapapa, kaitiakitanga, tikanga). More recent progress to centre hapū and iwi approaches are evidence of the efforts by mana whenua/mana moana partnerships across Aotearoa and Te Waipounamu. For example, in a review by Ratana et al. (2017), co-management agreements were reported to lead to better working relationships and apparent success in the embedding of indigenous values in marine management - the key commonality being legislative or legal backing to enforce these arrangements (Ratana et al. 2017).

EBM provides an opportunity to address deficiencies in contemporary marine management approaches for the benefit of our environment, Tangata Whenua and future generations. Being anchored by Te Tiriti o Waitangi, including people as part of the environment, drawing on centuries of extensive/intimate mātauranga (developed within rohe whenua/rohe moana), reflecting on past/present/future effects (i.e., multiple temporal/intergenerational scales), and reflecting the connectivity and interdependencies of ecosystems and the multiple species they support (beyond current Crown jurisdictions) – are key attributes that will better reflect scale and scale-dependencies from te ao Māori perspectives in future visualisation tools (i.e., the next phase of this project).

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## Appendix 1: Glossary of Māori terms

In order of the Māori alphabet: a, e, i, o, u, h, k, m, n, p, r, t, w, ng, wh.

amokura	Pacific red-tailed tropic bird
iwi	extended kinship group, tribe, nation, people, nationality – often refers to a large group of people descended from a common ancestor and associated with a district territory.
hapori	section of a kinship group, family, society, community
hapori whānui	public, wider community
hapū	kinship group, clan, tribe, sub-tribe, extended family – often refers to a sub-tribal/extended family kinship group, which consists of extend family who descend from a common ancestor.
Hawaiki	ancient homeland – the places from which Māori migrated to Aotearoa.
kāinga	home, residence, village, settlement.
kaitiaki/tangata tiaki	the contemporary definition is utilised in this research in regard to fisheries: The custodian, guardian, keeper, steward of customary fisheries designated by tangata whenua.
kaitiakitanga	the intergenerational exercise of customary custodianship, in a manner that incorporates spiritual matters, by those who hold mana whenua/moana status for a particular area or resource.
kuaka	godwit
mahinga kai	referring to the species that have traditionally been used as food, tools, medicine, or other resources, including the act of harvesting/practice/use of those resources and the places they are gathered.
manaakitanga	the practice of showing respect, generosity and care for others, caring for people, places and other living and non-living things.
mana	prestige, authority, status
mana whakahaere	governance, authority, jurisdiction, management, mandate, power.
mana whenua/mana moana	refers to the local tribe/sub-tribal group who hold mana, have jurisdiction, and have ‘demonstrated authority’ over land or territory in a particular area, authority which is derived through whakapapa links to that area. According to Māori custom, land rights extended as well to adjacent sea or lakes with fixed boundaries for inshore and deep-sea fishing and the gathering of seafood.
mangō	shark (in general)

marae	often used to include the complex of buildings around the marae, which marae is the courtyard – the open area in front of the whareniui.
mātanga	experienced person, expert, specialist, consultant, professional, practitioner, old hand, analyst.
mātauranga Māori, mātauranga-a-hapū, mātauranga-a-iwi	mātauranga also includes the pursuit of knowledge and comprehension of te taiao following a systematic methodology based on evidence, and incorporating culture, values, and world views (Hikuroa 2017). Mātauranga-a-hapū and mātauranga-a-iwi are the specific knowledge of hapū and iwi.
rangatiratanga	authority, autonomy, sovereignty, principality, self-determination
rāhui	prohibition/closure/restriction
rohe	boundary, district, region, territory, area, border (of land, of water, of ocean).
Tangata Whenua	local people, hosts, Indigenous people – people born of the whenua
te ao Māori	according to Māori perspective(s)/worldview
Te Moana-nui-a-Kiwa	The Great Ocean of Kiwa, also known as the Pacific Ocean.
tītī	‘mutton-bird’ – Sooty shearwater.
tohorā	whale (in general)
tuna	freshwater eel (in general)
waka	vehicle, canoe; and allied kinship groups descended from the crew of a canoe which migrate to Aotearoa and occupying a set territory
whakapapa	whakapapa in a literal translation is the act of layering or creating a base. This term is commonly understood in English as genealogy. However, this translation misses the relational nature of this concept. Whakapapa supports a kincentric ecology compared to the direct lineal relationships of genealogy.
whenua	land – often used in the plural; country, land, nation, state; territory, domain