

Envisioning small-scale kaupapa Māori aquaculture economies for indigenizing ocean governance in Aotearoa, New Zealand.

Georgia McLellan^a, Simon Muncaster^b, Jason Murray^c, Danny Paruru^d and Matthew Roskrug^e

^a Massey University, New Zealand (affiliations: Whakatōhea, Ngāi Te Rangi)

* Correspondence to: Te Au Rangahau, Massey University, Private bag 11 222, Palmerston North, 4442, New Zealand.

Email address: Georgia.mclellan@massey.ac.nz (G. McLellan)

^b University of Waikato, Tauranga, New Zealand (affiliations: Tauīwi)

^c Matakana Island Marine Club, New Zealand (affiliations: Ngāi Te Rangi)

^d Whakatōhea Māori Trust Board, New Zealand (affiliations: Whakatōhea)

^e Massey University, New Zealand (affiliations: Te Ātiawa, Ngāti Tama)

1. Abstract

Traditional Māori aquatic cultivation practices in Aotearoa New Zealand were centred around the kaitiakitanga (management and stewardship) of marine resources for local livelihoods. Today, modern Māori aquaculture is geared towards commercial outputs for local and export markets with Māori having a prominent role in the Aotearoa aquaculture industry.

Alongside this commercial presence lies a growing interest in revitalising traditional Māori aquatic practices and integrating Māori values to enhance local Māori livelihoods. However, Aotearoa's current policy environment is focused on supporting commercial aquaculture, and not well positioned to support these objectives.

This paper discusses kaupapa Māori aquaculture as a pathway towards equitable ocean governance in Aotearoa. We formally define Kaupapa Māori aquaculture and present two case study examples of Māori communities who aspire to practice kaupapa Māori aquaculture within their tribal areas. We posit that kaupapa Māori aquaculture has the potential to enhance the self-determination of coastal Māori communities and revitalise traditional livelihood practices whilst also being connected to commercial modes of production, and is therefore an important consideration for future aquaculture development in Aotearoa. We find that the current marine policy environment in Aotearoa is narrowly focused on short-term, financial outcomes and is not equipped to enable kaupapa Māori aquaculture. Marine policy in Aotearoa must incorporate diverse economic understandings and long-term perspectives if equitable ocean governance is to be achieved. This research has important implications as indigenous groups including Māori strive for self-determination and values-driven development.

Keywords: Indigenous aquaculture, Blue economy, Indigenous governance, Local knowledge, Māori

2. Introduction

Equitable ocean governance is of extreme importance in Aotearoa, especially for coastal Māori communities looking to restore marine-based tino rangatiratanga¹. Colonial and settler-colonial processes and the imposition of Western systems and laws in Aotearoa have breached Te tiriti o Waitangi² and ignored Māori customary rights grounded in their status as tangata whenua. As a result of these processes many Māori groups have lost their ability to fully enact tino rangatiratanga including their ability to control and govern marine resources. Furthermore, climate change and its affects have led to declining fish numbers as well as habitat modification and degradation, further harming Māori marine-based self-determination (Pinkerton, 2018).

Achieving equitable ocean governance in Aotearoa would enhance Māori self-determination in the marine space. This could be achieved through enabling kaupapa Māori aquaculture which offers a contemporary pathway for coastal Māori communities to enact their rangatiratanga³ and reclaim traditional knowledges and practices, including kaitiakitanga⁴. Kaupapa Māori aquaculture is grounded in te ao Māori (the Māori world); it integrates both traditional and contemporary Māori knowledges and practices with modern aquaculture techniques and links to financial markets. This paper sets out to envision kaupapa Māori aquaculture and discusses it as a pathway towards equitable indigenised ocean governance in Aotearoa.

The method of visioning behind this paper is drawn from Dell et al., who, inspired by Mānuka Henare's concept of *the economy of mana*, set out a research agenda for visioning future Māori economies. Dell et al (2018) define the economy of mana as "An economic system in which decisions regarding investment, production, consumption and wealth distribution are influenced by the interplay of mana-enhancing interactions between people and the environment" (p. 55). Dell et al. (2018) discuss the importance of Māori-centred visioning for shaping Māori economic futures, as following the economic trajectory and goals of dominant euro-centric economies "risks perpetuating actions and behaviours common in the capitalist colonial system" (p. 50). Dell et al. (2018) go on to outline what

¹ Māori self-determination

² The Māori translation of The Treaty of Waitangi commonly referred to as the founding document of Aotearoa

³ Right to exercise authority

⁴ Māori environmental stewardship

successful visioning might look like, which, among other things, includes outlining possibilities and potentialities for future desired Māori economies and "Defining the value-systems, incentive drivers, cycles of production, structures and mechanisms of Māori-centric activities ... to illuminate alternative paths and means to enriched economic futures." (p. 60)

In order to envision kaupapa Māori aquaculture as a pathway to equitable and sustainable ocean governance in Aotearoa, we start by providing a background of Māori aquaculture practices in Aotearoa. We then discuss two case studies of Māori communities who are interested in partaking in kaupapa Māori aquaculture. These findings are drawn from a research project; *A novel approach to aquaculture in Aotearoa, New Zealand* where researchers collaborated with two case study partners; Matakana and Rangiwaea hapū and Whakatōhea Māori Trust Board to explore the potentiality of small-scale pātiki tōtara aquaculture in Aotearoa. The discussion section of this paper outlines a formal definition of kaupapa Māori aquaculture, outlining its potential benefits and critically analysing the current policy environment in Aotearoa in relation to enabling kaupapa Māori aquaculture. This paper concludes by proposing policy recommendations to support and enable the development of kaupapa Māori aquaculture for more equitable and indigenised ocean governance in Aotearoa.

3. Literature Review - Māori-aquaculture

3.1 Traditional Māori aquatic cultivation practices

Pre-colonial Māori had developed techniques to enhance the production of aquatic resources (Gram et al., 2010). Tuterangiwhiu et al., (2021) refer to this type of aquaculture as Traditional Aquatic cultivation practices. These included the construction and maintenance of Pā tuna⁵ and utu piharau⁶, as well as the cultivation of māra mātaitai⁷ (Keane, 2007; Tuterangiwhiu et al., 2021). This latter practice included translocating and reseeding aquatic species and tending to fish nurseries (The Waitangi Tribunal, 1988, 1992). Boulders or rocks were used to demarcate māra mātaitai and provide habitats for aquatic species (Waitangi Tribunal, 2002). Key māra mātaitai species included timurimu⁸,

⁵ eel weirs

⁶ lamprey weirs

⁷ Māori seafood gardens

⁸ Seaweeds (unspecific)

kuku⁹ (Best, 1929), and toheroa¹⁰ (Ross et al., n.d.). Ngāi Tahu, a tribe located in the South Island of Aotearoa, are known for their use of poha¹¹ to transport and translocate aquatic species (Williams, 2016). Innovations to support sustainability include holes in the poha created to release juvenile aquatic species and seed new beds (Williams, 2016). Ngāi Tahu also used predatory whelk snails to remove infected shellfish from māra mātaītai (Ross et al., n.d.).

Traditional aquatic cultivation practices were place-based and heavily influenced by local people, ecologies and knowledge (Tuterangiwhiu et al., 2021). Particular thought was given to the mauri¹² of all things. Cultivation areas were seen as part of, not separate to, the environmental systems that sustained them and the people that created and maintained them (Tuterangiwhiu et al., 2021). The health of the whole system was prioritized, not just the size, growth and quantity of aquatic outputs (Tuterangiwhiu et al., 2021). These aquatic practices were grounded in whakapapa (Rongonui et al., 2023) or genealogical linkages which connected Māori to each other (including past and future generations) as well as to all elements of the natural world (Mikaere, 2011). Whakapapa relations obliged whānau to exist in reciprocal relation with each other and their more-than-human kin, which included aquatic organisms (Mikaere, 2011). Colonialism and settler-colonialism forcibly removed Māori from their traditional way of being, severely impacting their ability to carry out traditional aquatic cultivation practices (Tuterangiwhiu, 2023). For example, early European settlers removed pā tuna to make their rivers navigable (Keane, 2007). Colonial legislation was put in place in an attempt to limit Māori commercial fishing activity. Jackson (2013) discusses legislation from 1877 to 1983, including the Fishers Conservation Act, which prohibited Māori from commercial fishing and aquaculture. These historic policies and processes have depleted the number of traditional Māori aquatic cultivation practices and their practitioners, ultimately leading to a loss of local knowledge and experience (Ronogui et al., 2023). Consequentially, many Māori groups are very much removed from their traditional aquatic cultivation practices today (Tuterangiwhiu et al., 2021).

More recent efforts to decolonise and revitalise the Māori worldview and enforce governing treaties has resulted in a fractional return of seized assets, and Māori are now significant players in Aotearoa's

⁹ *perna canaliculus*, green-lipped mussels

¹⁰ *Paphies ventricose*, surf clam endemic to New Zealand

¹¹ kelp bags

¹² Life force or essence

commercial aquaculture industry (Te Puni Kōkiri, 2007). Several aquaculture operations in Aotearoa are owned or operated by Māori individuals or organisations such as Whakatōhea Mussels Ōpotiki Limited and Wakatū Incorporation. These modern Māori aquaculture operations positively contribute to thriving livelihoods and provide a diverse range of jobs and investment opportunities for Māori throughout Aotearoa. However, the types of livelihood generated from these commercial operations differ significantly from those associated with traditional aquatic cultivation practices in Aotearoa. They do not necessarily incorporate or rely on the knowledge, rites and relations modelled through traditional Māori aquatic cultivation practices. However, there is now a growing interest in reviving these traditional practices and understanding how they relate to the health and sustainability of fisheries.

3.2 Traditional Māori Aquatic Cultivation Practices – A Contemporary Re-emergence

The emerging interest in re-instating traditional Māori aquatic cultivation practices, including those involving taonga species, is both a response to the alienation of Māori from these practices and the realization that Māori groups hold a vast amount of knowledge in this space, which goes largely undervalued and unrecognized (Tuterangiwhiu et al., 2021). One example of research to support this revival is the Te Kete Rau Kotahi project, a collaboration between the Te Waiaraki Iwi Collective and Cawthron Research Institute to develop a mātauranga Māori aquaculture framework to guide aquaculture development rooted in cultural principles (Shine Collective, n.d.). Moreover, international and cross-cultural collaborations have developed through the Whakaika te Moana project, which aimed to explore, "retrieve and re-initiate" (p.3) traditional Māori aquatic cultivation practices (Tuterangiwhiu et al., 2021). This work acknowledges that the local knowledge of similar, traditional aquaculture practices of indigenous communities across the Pacific may help inform the local revival of traditional Māori aquatic cultivation practices (Tuterangiwhiu et al., 2021). While such international collaborations are important, local mātauranga persists through individuals who share this knowledge among communities to keep these practices alive. Community development of māra mātaimai to enhance lobster nurseries and reef ecosystems (Museum of New Zealand, n.d.) and the translocation of historic shellfish beds threatened by industrial dredging (Ross et al., n.d.) are examples of traditional practices in modern Aotearoa.

4. Findings - Emerging kaupapa Māori aquaculture economies in Aotearoa

We define kaupapa Māori aquaculture economies as “by Māori, for Māori aquaculture practices that incorporate a Māori worldview”. We consider two examples of emerging kaupapa Māori aquaculture economies in Aotearoa: Matakana and Rangiwaea hapū, and Whakatōhea Māori Trust Board. Matakana and Rangiwaea hapū, and Whakatōhea Māori Trust Board are interested in establishing small-scale pātiki aquaculture in their tribal areas. Both groups are yet to establish kaupapa Māori pātiki aquaculture economies. However, they have determined specific aspirations and concerns for how they desire these economies to operate. These case studies are drawn from numerous hui¹³ and wānanga¹⁴ with Matakana and Rangiwaea hapū, and Whakatōhea Māori Trust Board. The information used here was appraised and approved by iwi leader representatives from both groups.

4.1 Pātiki background

Pātiki totara¹⁵ are a culturally significant species in Aotearoa (Ellis-Smith, 2022), where they are considered taonga or treasured possessions. The significance of these fish is demonstrated in whakataukī¹⁶, pūrākau¹⁷ and toi Māori¹⁸ that have been used to express and share mātauranga and tikanga across generations. For example, Whaanga et al. (2018) studied environment-related whakataukī and found six pertaining to pātiki. One of the most renowned is “E kore te pātiki e hoki ki tona puehu - The flounder does not return to the mud it has stirred” (Elder, 2020, p. 179). Elder (2020) posits that this is related to human fears of the unknown as well as the fact that sometimes it is best to walk away from our mistakes rather than address them. Diamond-shaped pātiki designs are common in Toi Māori. The people of Ngati Porou attribute this prevalence to the fact that pātiki are

¹³ meetings

¹⁴ Māori-orientated workshops

¹⁵ *Rhombosolea leporina* yellowbelly flounder

¹⁶ Māori proverbs

¹⁷ Māori narratives

¹⁸ Māori art

able to provide sustenance for a large number of people (Ngā Puna Waihanga - Waitaha Tai Poutini, 2003).

For centuries, pātiki have been a quintessential part of mahinga kai¹⁹ practices for Māori groups around the coastal margin (Maniapoto Māori Trust Board, 2015; Moana Rāhui o Aotea, n.d.; Robin-Middleton, 2019; Sutton et al., 2022; Wakefield et al., 2013; Walker, 2007). Māori groups have inherent rights and responsibilities related to their taonga, grounded in both their status as tangata whenua and Te Tiriti o Waitangi. Under this Te Tiriti, both signatory and non-signatory Māori groups hold mana motuhake²⁰ over their taonga (Simon, 2016), including pātiki. These factors make pātiki an suitable candidate for kaupapa Māori aquaculture.

4.2 Case study 1 - Matakana and Rangiwaea hapū

Matakana and Rangiwaea are two neighbouring islands located under the shadow of Mauao, a local mountain in the Bay of Plenty. Five hapū originate from these islands: Te Whanau a Tauwhao, Te Ngare, Ngai Tamawhariua, Ngati Tauaiti and Ngai Tuwhiwhia (Matakana & Rangiwaea Island, 2012). Many whānau who reside on the islands have lived there their whole lives (Matakana & Rangiwaea Island, 2012). There is a strong hapū presence on the islands, and the hapū hold deep connections with their whenua²¹ and the moana²² that surround them including Te Awanui²³ and Te Moana-nui-ā-Toi²⁴ as well as various freshwater bodies (Matakana & Rangiwaea Island, 2012). Matakana and Rangiwaea hapū refer to these water bodies as their pātaka kai¹⁷. Kaimoana, including pātiki, is a fundamental food source that has served families on these islands for a very long time (Matakana & Rangiwaea Island, 2012). New Zealand government policy and legislation has attempted to limit the ability of Matakana and Rangiwaea hapū to exert their customary rights. For example, the hapū and other iwi and hapū in the surrounding area are not allowed to practice open ocean aquaculture due to the activity and interests of Port of Tauranga²⁵ who lobby the New Zealand government for control over space within Te Moana-nui-ā-Toi. Matakana and Rangiwaea hapū have expressed their concerns

Commented [MOU1]: Could i do a Pers Comm thing here with Jason?

¹⁹ food gathering and stewarding

²⁰ Indigenous autonomous power

²¹ land

²² sea

²³ Tauranga harbour

²⁴ coastal Bay of Plenty

²⁵ A privately owned port in Tauranga

about environmental degradation in their rohe including dredging of the Tauranga harbour and the increasing number of recreational and commercial fishers around the islands, which are both impacting their access to kaimoana (Matakana & Rangiwaea Island, 2012).

Matakana and Rangiwaea hapū take the stance that their customary rights precede government legislation and therefore their rights to self-determination it is therefore vital that they retain tino rangatiratanga over any pātiki aquaculture that might take place in their rohe²⁶. This means that governance should take place at the hapū, rather than the iwi level and any activity should be guided by Matakana and Rangiwaea specific mātauranga²⁷, tikanga²⁸ and kaitiakitanga. It is also essential for Matakana and Rangiwaea hapū that any pātiki aquaculture that might take place in the rohe contributes to cultural, social and environmental outcomes for their families living on the islands. For example, the hapū have identified pātiki aquaculture as a way to restore traditional pātiki breeding grounds, something which has been established as a priority in their 2012 hapū management plan (Matakana & Rangiwaea Island, 2012). It is vital that any aquaculture activity that takes place on the islands is as environmentally sustainable as possible. The hapū have clarified that they plan to be the majority, if not the only, shareholders in any local pātiki aquaculture operation to ensure that any commercial benefits filter back to the island communities.

In our various conversations with Matakana and Rangiwaea hapū members, they outlined several concerns regarding pātiki aquaculture in their tribal area. For example, some hapū members were concerned about the potential taste of cultivated pātiki. They wondered if this would differ from the experience of consuming wild pātiki. Other concerns related to policy barriers including the cost of gaining legislative consent to implement pātiki aquaculture on the islands. One of the main concerns that hapū members had was navigating the use of mātauranga and Western science through the implementation of pātiki aquaculture.

²⁶ Tribal area

²⁷ Intergenerational Māori knowledge

²⁸ Māori customs

4.3 Case study 2 - Whakatōhea Māori Trust Board

Whakatōhea Māori Trust Board is the mandated iwi organisation for Whakatōhea iwi, set up to administer Whakatōhea compensation awarded by the New Zealand government for historical grievances. As a result of Whakatōhea's recent treaty settlement The Whakatōhea Māori Trust Board is transitioning into the post-settlement entity, Te Tawharau o te Whakatōhea in mid 2024. As a result the Whakatōhea Māori Trust Board will dissolve however, the hapū that have continued to maintain governance of the Whakatōhea Māori Trust Board will also govern the new entity. The Whakatōhea rohe is located in the Ōpōtiki area, approximately 150 kilometres southeast of Matakana and Rangiwākea Islands. Whakatōhea iwi consists of six hapū: Upokorehe, Ngāti Patumoana, Ngāti Ira, Ngāti Ngahere, Ngāti Rua and Ngai Tamahau. For Whakatōhea, taonga are; "anything tangible or intangible that contribute to the tribes intellectual (taha hinengaro), physical (taha tinana) and spiritual wellbeing (taha wairua)" (Whakatōhea, 1993, p. 9). Whakatōhea relationships with taonga are based on both whakapapa relations and "long-form physical associations and experiences" (Whakatōhea, 1993, p. 5). In this way, Pātiki can be considered taonga as they are a sustainable food source that has always been harvested by whānau and are reflected in local art and design.

Whakatōhea have a set of customary rights and responsibilities, exercised through tino rangatiratanga and kaitiakitanga, which allow them to harvest and manage their taonga, including fisheries, in a way that reflects their aspirations (Whakatōhea, 1993). Whakatōhea have made clear their need to "ensure absolute protection of customary fishing rights, traditional fisheries resources and habitats." (Whakatōhea, 1993, p. 36). Whakatōhea rights and responsibilities in relation to their taonga grounded in their status as tangata whenua are confirmed and guaranteed by Te Tiriti o Waitangi, which was signed by several Whakatōhea chiefs on May 27 1840 (Whakatōhea, 1993). However, much like Matakana and Rangiwākea hapū, their ability to carry out these rights and responsibilities has been eroded over time through colonization and subsequent settler-colonialism.

Pātiki numbers have dropped over time but are still a prominent source of kai in the rohe. Whakatōhea Māori Trust Board believe that Whakatōhea access to traditional fisheries has reduced due to overharvesting, overfishing and mismanagement of resources by government, commercial and

recreational interests. Moreover, awa²⁹ in their area have experienced environmental degradation since European arrival in the area, including post-colonial land modification and industrialization (McClellan, 2020; Walker, 2007). Whakatōhea Māori Trust Board also suspect that commercial fishing negatively impacts pātiki. For Whakatōhea Māori Trust Board, a tino rangatiratanga-driven Pātiki economy means one in which they can balance cultural, social, and environmental outcomes. They seek to implement Whakatōhea-based tikanga, mātauranga and kaitiakitanga, including whakapapa-based relations. Whakatōhea Māori Trust Board are not interested in developing a typical profit-maximizing business. Instead, they wish to use revenue generated to create positive outcomes for their people and the environment. While Whakatōhea Māori Trust Board understand that any pātiki aquaculture that takes place in their area will need to involve commerce in order to fund operations, they have explicitly highlighted that environmental imperatives are more important to them than commercial gain.

Whakatōhea Māori Trust Board have similar concerns to Matakana and Rangiwaea hapū surrounding the implementation of pātiki aquaculture in their rohe. For example, they are also curious about the taste of farmed pātiki compared to wild-caught. Whakatōhea Māori Trust Board are concerned about the legal and financial barriers associated with consent policies under the Resource Management Act 1991. Furthermore they have some concerns around navigating mātauranga and Western science. Many Whakatōhea iwi members see pātiki as taonga and, therefore, wish to treat them with dignity and respect through any aquaculture processes. It is vital for Whakatōhea Māori Trust Board that the mauri and the mana of the pātiki is maintained during aquaculture processes. Thinking about pātiki living in a sterile, commercial environment was challenging for some Whakatōhea iwi members, and they would like the farmed pātiki environment to replicate its natural environment as much as possible.

5. Discussion - Kaupapa Māori Aquaculture

We define kaupapa Māori aquaculture as aquaculture practices that are developed by Māori, for Māori and grounded in a te ao Māori worldview. In this sense, kaupapa Māori aquaculture differs from commercial Māori aquaculture and traditional Māori aquatic cultivation practices as it has the potential to incorporate both commercial and non-commercial forms of livelihood production. Corporate-scale Māori aquaculture has significant benefits, not just for Māori, but for the whole of Aotearoa, providing

²⁹ rivers

local jobs, investment opportunities and growing the domestic aquaculture industry. However, this practice does not always align with traditional ways of practising Māori economies because it adopts economies of scale and wealth accumulation approaches (Henare, 2014). Large-scale farming and ownership of farmed stock were not part of traditional Māori resource management systems (Rongonui et al., 2023). Intensively farmed, single-species aquaculture-based economies are not the preferred option for many coastal hapū communities (Tuterangiwhiu et al., 2021). This runs true for both our case study partners who are opposed to intensive pātiki aquaculture.

Traditional Māori aquatic cultivation practices may be considered as a type of kaupapa Māori aquaculture. However, what differentiates kaupapa Māori aquaculture from these practices is its ability to incorporate modern technology and connect to financial markets whilst embracing a traditional-values first ethics. Kaupapa Māori aquaculture (as opposed to Traditional Māori aquatic cultivation practices) is necessary to serve coastal communities that exist within modern-day Aotearoa, a world that is inextricably connected to capitalist modes of production and consumption and dependent on modern technologies.

Kaupapa Māori aquaculture is aligned with Indigenous blue economies. Rout et al. (2019) define an indigenous blue economy as a blue economy³⁰ that "consider[s] not just financial and natural capital but also human capital ... in dynamic, nested exchange rather than the human and natural in service to the economy" (p. 8). Indigenized blue economies acknowledge economy as embedded in the broader environment that sustains them (Matt Rout & Paul Mika, 2019). Unlike dominant forms of economies, which focus on flows of financial capital, Indigenous blue economies also acknowledge flows of human and natural capital (Matt Rout & Paul Mika, 2019), for example, the value generated from the work of 'more-than-human others' within economies like the disease-management work of the whelk snail discussed above. Further, indigenous blue economies require a flow of financial capital back to human and natural environments (Matt Rout & Paul Mika, 2019). Matakana and Rangiwaea hapū aspirations to use pātiki aquaculture as a means to restore wild pātiki breeding in their marine tribal area is reflective of an indigenized blue economy. This type of blue economy prioritises

³⁰ The Sustainable Seas National Science Challenge in Aotearoa define the blue economy as "Marine activities that generate economic value and contribute positively to ecological, cultural and social wellbeing" (Short et al., 2023, p. 6)

environmental restoration and serves the wellbeing of local coastal communities through traditional-values based governance.

Kaupapa Māori aquaculture practices are also an example of contemporary economies of mana. Māori economist and historian Mānuka Henare (2014) coined the term *economies of mana* to describe the values system and worldview that underpinned traditional Māori economies. Mana can be understood as "the potent human state with the profound ability to impact upon, affect and transform the lives of others" (Dell, 2017, p. 93). However, it is more commonly understood as prestige, authority, power, influence, status, spiritual power, charisma. Dell et al. (2018) colleagues of Henare defined the economy of mana as; "an economic system in which decisions regarding investment, production, consumption and wealth distribution are influenced by the interplay of mana-enhancing interactions between people and the environment" (p. 55). Economies of mana are driven by "spiritual, ecological, social and cultural considerations" (Henare, 2014, p. 65). They are defined by re-distribution, abundance and wellbeing, not profit maximization (Henare, 2014). Practices within economies of mana work to enhance the mana of human and non-human others (Henare, 2014). There are obvious parallels between descriptions of economies of mana in the literature and kaupapa Māori aquaculture economies, including the aspirations for pātiki aquaculture that have been highlighted. For example, the importance placed upon cultural, social and environmental outcomes and the re-distributive intentions of Matakana and Rangiwaea hapū and Whakatōhea Māori Trust Board through aquaculture. The following section outlines the various benefits that might be derived from enacting kaupapa Māori aquaculture.

5.1 Enacting kaupapa Māori aquaculture for improved environmental governance and stronger blue economy

Kaupapa Māori aquaculture is an active form of contemporary tino rangatiratanga as it is guided by local Māori aspirations, grounded in a Māori world view and provides an opportunity for Māori groups to practice and share traditional knowledge and customs. Indigenous-led community aquaculture is used as a vessel for knowledge sharing elsewhere, for example, in Hawai'i, where local fishponds have been identified as important educational tools (Hlawati, 2002). Partaking in kaupapa Māori aquaculture practices also provides Māori groups with an opportunity to not only connect with each other but to

connect with their more-than-human kin, the wider environment, their ancestors and descendants and atua or gods such as Tangaroa³¹. In Hawai'i, some aquaculture areas have a deeper spiritual purpose and are regarded as sacred places closely connected to particular gods (Hlawati, 2002). Enacting kaupapa Māori aquaculture provides opportunities for strengthening hapū and iwi bonds to each other and to land and sea. It also provides an opportunity to learn and enhance hapū and iwi-based kaitiakitanga, mātauranga and tikanga in place.

In incorporating tino rangatiratanga, kaupapa Māori aquaculture practices also offer a contemporary form of mahinga kai. Many Māori groups were stripped of their access to mahinga kai practices through colonialization and subsequent colonial practices (Lindsay et al., 2018; Mclellan, 2020; Shelling, 2023; Taiapa et al., 2021; Walker, 2007). Kaupapa Māori aquaculture offers an important opportunity for enhancing mahinga kai by improving access to food produced by Māori and for Māori, through Māori means. There are examples of small-scale indigenous aquaculture enhancing food sovereignty elsewhere for instance, Millin (2020) posits that small-scale indigenous aquaculture can restore access to traditional food systems and wider ways of being. This enhances the control these groups have over their food worlds, making them more food-sovereign (2020). Indigenous food sovereignty differs from food security as it involves self-determination including the ability of Māori groups to have full agency over their food worlds (Mclellan, 2020). Indigenous notions of food sovereignty incorporate reciprocal relations between people and land within the provisioning and stewarding of resources (Kepkiewicz & Dale, 2019; Martens, 2015). Furthermore Indigenous food sovereignty is inherently decolonial working to mitigate the various negative effects of settler colonial food systems on indigenous livelihoods (Coté, 2016; Martens, 2015; Whyte, 2016), it ultimately leads to better livelihood outcomes for Māori communities.

Kaupapa Māori aquaculture has the potential to become an integral component of climate change adaptation and resilience in Aotearoa. Millin (2020) noted that small-scale indigenous aquatic cultivation systems such as clam gardens in Canada and loko i'a³² in Hawai'i hold the key to understanding, mitigating, and adapting to climate change impacts (Millin, 2020). This is because these systems involve a large amount of continual, communal hands on work. The stewards of these systems

³¹ God of the sea

³² fishponds

are experts at monitoring and managing their local environments and are therefore well positioned to quickly understand micro and macro climate changes (Millin, 2020). Furthermore the impermanence of these small-scale community-run systems also makes them less vulnerable to climate change because they are flexible and can adapt over time. For example, the rock walls used in clam gardens and loko i'a are easily moved and placed elsewhere. The bonds built through this community work and stewardship simultaneously build the capability to pull together during climate change disasters. This is no different for the case study examples we have discussed above. Whakatōhea, Matakana and Rangiwhaea Island people have practised kaitiakitanga within their land and ocean spaces for hundreds of years – they are experts within their localized environmental systems. Kaupapa Māori aquaculture has the potential to become a vital component of Māori climate change adaption and mitigation strategies.

Millin (2020) also discusses how small-scale indigenous aquatic cultivation systems can aid climate change adaptation by increasing the health of their surrounding ecosystems. These systems naturally increase seafood production without many of the detrimental effects of large-scale, single-species aquaculture (Millin, 2020). Clam gardens in Canada, for example, increase the biodiversity of their surrounding environments whilst loko i'a in Hawai'i also aid their surrounding environments in several ways, including releasing healthy run-off into neighbouring environments (Millin, 2020). Both Makatana and Rangiwhaea hapū and Whakatōhea Māori Trust Board have highlighted their aspirations for restoring pātiki stocks and wider environmental ecosystems in their rohe through pātiki aquaculture. Alongside case study partners, we have identified several potential positive environmental effects of small-scale pātiki aquaculture in their rohe. These include taking pressure off wild stocks and replenishing wild pātiki populations with farmed stock.

5.2 Current barriers to enacting kaupapa Māori aquaculture

While kaupapa Māori aquaculture is not common practice in Aotearoa, the foundation to realizing this exists in the inherent rights of Māori groups as tangata whenua. Te Tiriti o Waitangi, the founding document of contemporary Aotearoa, also confirms and guarantees Māori fishing rights (Rongonui et al., 2023) and, therefore, kaupapa Māori aquaculture. Moreover, the Marine and Coastal Area (Takutai Moana) Act 2011 works to recognize Māori customary coastal interests (Rongonui et al.,

2023). In 2019, the New Zealand government seemed eager to enable kaupapa Māori aquaculture through their aquaculture strategy (Ministry for Primary Industries, 2020), where they laid out intentions to give effect to Māori aquaculture aspirations. The strategy (Ministry for Primary Industries, 2020) highlighted government intentions to generate an industry that incorporates by Māori, for Māori aquaculture and a Māori worldview, including the utilization of traditional Māori aquaculture materials and practices. Current legislation supports Māori self-determination to a certain extent, for example there are upcoming claims under the Marine and Coastal Area (Takutai Moana) Act 2011 which challenge the governments approach to determine where hapū and iwi can have aquaculture farms and what they can do including many within Te Moana-nui-ā-Toi (Te Arawhiti, n.d.-b, n.d.-a). However, significant policy-centred barriers to implementing kaupapa Māori aquaculture remain.

Rout et al. (2024) outline how the Quota Management system, Aotearoa's current legal framework for managing ocean resources, impedes Māori from generating an indigenized blue economy. Rout et al (2024) posit that the QMS restricts indigenous blue economy by a) centralizing Māori fisheries assets into iwi control even though traditionally Māori groups aligned more with their hapū³³ than their iwi³⁴; b) dividing Māori fishing rights into customary, commercial and recreational, creates an unnaturally fragmented system which does not align with a Māori world view; and c) commodifying Māori fisheries assets in a way which encourages low-value, high-volume fisheries practices.

One of the most controversial pieces of legislation to affect the development of kaupapa Māori aquaculture is the Seabed and Foreshore Act 2004 which granted the New Zealand government ownership of the foreshore and seabed. That same year, the Māori Commercial Aquaculture Claims Settlement Act 2004 was passed to grant Māori groups 20% of newly consented aquaculture space. Although this act reduces some of the financial barriers to do with aquaculture start-up costs in Aotearoa it was criticized by Māori leaders and scholars alike, with one Māori politician stating that through the Māori Commercial Aquaculture Claims Settlement Act 2004 the New Zealand government created legislative policy to assign indigenous aquaculture space, which it had already acquired illegally through the passing of the Seabed and Foreshore Act 2004 (Flavell, *Te Ururoa*, n.d.).

³³ sub-tribe

³⁴ tribe

Rongonui et al. (2023) highlight the fact that the Māori Commercial Aquaculture Settlement Act 2004 does not consider or include non-commercial aquaculture practices. Moreover, Tuterangiwhiu et al (2021) point out that the existing aquaculture consenting process is complex, convoluted and generally difficult for smaller Māori communities to navigate. The loss of ability to govern the local environment denies these communities the ability to enact traditional management practices. Furthermore, centralized governance of these resources, at both the national and regional scale, tends to promote incumbent commercial aquaculture practices over kaupapa Māori aquaculture. This apparent competition may be indirect in that the latter may not be a recognized practice under existing policy, or designated aquaculture areas may not be suitable for small community-scale development.

Despite the Māori Commercial Aquaculture Settlements Act 2004 reducing some of the financial burden of aquaculture activities for Māori and the large amount of government investment in Māori aquaculture, financial barriers to Māori-driven aquaculture initiatives remain. Government aquaculture policies primarily focus on facilitating commercial operations, with limited incentives provided for non-commercial aquaculture (Rongonui et al., 2023). Commercial and non-commercial aquaculture activities both require resource consents through the Resource Management Act 1991 and the consenting process can be expensive. Cram et al. (2010) found that a lack of resources can inhibit hapū and even some larger iwi from starting their own aquaculture initiatives. High start-up costs mean that smaller Māori communities are unable to start-up their aquaculture initiatives without collaborating with other Māori groups, private organisations or government (Cram et al., 2010). Our case study partners may face the same challenges when working to implement pātiki aquaculture and have expressed their concerns about high-start-up costs. Forced collaboration can diminish the self-determination of smaller Māori communities and their ability to apply their unique tikanga, mātauranga and kaitiakitanga to aquaculture activities as other parties are involved (Cram et al., 2010). One example of Māori aquaculture collaboration is Whakatōhea Mussels Ōpotiki Limited which is a company born from a partnership between a partnership between Whakatōhea Māori Trust Board, The New Zealand government and private investors. Whakatōhea Māori Trust Board hold a high degree of self-determination in the venture but do not have full authority as they only own 9.28% of Whakatōhea Mussels Ōpotiki Limited (McLellan, 2020; New Zealand Companies Office, 2024).

There are environmental-related issues are creating barriers to the development of kaupapa Māori aquaculture. For example, many Māori groups are simply unable to access suitable sites for kaupapa

Māori aquaculture, or indeed the historic sites where their tūpuna practised traditional Māori aquatic cultivation practices, due to the privatization of coastal land (Ronogui et al., 2023). Furthermore, Many of the locations where kaupapa Māori aquaculture is likely to occur, for example, shallow, protected coastal areas, are vulnerable to damage from extreme wave events, which are increasingly common through climate change (Pinkerton, 2018). In some cases, climate change is modifying biodiversity patterns, causing species to migrate or disappear from certain areas in Aotearoa (Kenny, 2011; Pinkerton, 2018). This means that a) some traditional species may not be cultivatable through kaupapa Māori aquaculture and b) Māori groups may not be able to carry out traditional Māori aquatic cultivation practices in the same areas as their tūpuna. Matakana and Rangiwaea hapū for example, are concerned about how environmental degradation in their rohe impacts of their ability to harvest pātiki. This forms a large part of their motivation for implementing pātiki aquaculture. While the deleterious effects of climate change are being acknowledged in the commercial aquaculture sector, it should also be recognized that similar challenges must be addressed for coastal communities to develop Kaupapa Māori aquaculture.

6. Conclusion

This paper has examined kaupapa Māori aquaculture as an approach to achieving equitable ocean governance in Aotearoa. Two case studies were presented, illustrating the aspirations of Whakatōhea Māori Trust Board and Matakana and Rangiwaea hapū to engage in kaupapa Māori aquaculture. The paper went on to explore various benefits of kaupapa Māori aquaculture before examining barriers to implementation. This exploration of kaupapa Māori aquaculture has important implications for enacting equitable and indigenised ocean governance not only in Aotearoa but elsewhere where indigenous groups are searching for pathways towards self-determined futures grounded in indigenous ways of being.

Self-determination in the marine space is a vital aspect of tino rangatiratanga for many Māori groups, especially those who reside in coastal areas. Kaupapa Māori aquaculture allows coastal Māori communities to enact their tino rangatiratanga and provides a pathway to equitable ocean governance in Aotearoa. Grounded in a Māori worldview, it serves both people and the environment. However, it also has the potential to incorporate capitalist modes of production and connect to national and international financial markets. Furthermore, kaupapa Māori aquaculture has the potential to generate

many positive environmental externalities as it relies on long-term, place-based Māori environmental, cultural and spiritual knowledge. It can also serve as a new form of mahinga kai, enhancing food sovereignty for coastal Māori communities.

Whilst 21st-century policymakers have taken steps to enable Māori self-determination, such as the Māori Commercial Aquaculture Settlement Act 2004 and the Marine and Coastal Area (Takutai Moana) Act 2011, many Māori groups continue to lack the ability to enact their tino rangatiratanga within their marine areas. Current policies fall short of facilitating equitable ocean governance in Aotearoa as they are primarily geared towards generating short-term financial outputs from aquaculture practices. What is missing within these policies is any acknowledgement or intent towards enabling and investing in the long-term diverse benefits that might be gained from practices such as kaupapa Māori aquaculture. To achieve equitable ocean governance in Aotearoa, policymakers must recognize and support kaupapa Māori aquaculture and other practices grounded in te ao Māori that transcend short-term financial gains to offer a diversity of long-term benefits.

Funding

This work was supported in full by the Sustainable Seas National Science Challenge, established by the Ministry of Business, Innovation and Enterprise, New Zealand. Project number 2.16.

References

- Best, E. (1929). *Fishing Methods and Devices of the Māori*. E.C. Keating, Wellington.
- Coté, C. (2016). "Indigenizing" Food Sovereignty. Revitalizing Indigenous Food Practices and Ecological Knowledges in Canada and the United States. *Humanities Report*, 5(3), 1–14. <https://doi.org/10.3390/h5030057>
- Cram, F., Prendergast, T. A., Taupo, K., Phillips, H., & Parsons, M. (2010). Traditional Knowledge and Decision Making: Māori Involvement in Aquaculture and Biotechnology. *Proceedings of the Traditional Knowledge Conference (2008) Te Tatau Pounamu: The Greenstone Door Auckland: Te Pae o Te Maramatanga*, 147–157. <https://www.maramatanga.co.nz/media/173/download?attachment#page=158>
- Dell, K. (2017). *Te Hokinga kei te Ūkaipō - Disrupted Māori Management Theory* [Doctor of Philosophy in Management and International Business]. The University of Auckland.
- Dell, K., Staniland, N., & Nicholson, A. (2018). Economy of Mana: Where to next? *MAI Journal: A New Zealand Journal of Indigenous Scholarship*, 7(1), 51–65. <https://doi.org/10.20507/maijournal.2018.7.1.5>
- Elder, H. (2020). *Aroha - Māori wisdom for a contented life lived in harmony with our planet*. Penguin. <https://lukemcmeekenruscoe.com/2021/09/13/aroha-be-dr-hinemoa-elder/>
- Ellis-Smith, B. (2022). *Induced reproduction in Pātiki (Rhombosolea leporina), a novel endemic aquaculture candidate* [Master of Science in Ecology and Biodiversity, The University of Waikato]. <https://researchcommons.waikato.ac.nz/bitstream/handle/10289/15564/thesis.pdf?sequence=4&isAllowed=y>
- Flavell, Te Ururoa. (n.d.). Retrieved April 12, 2024, from https://www.parliament.nz/en/pb/hansard-debates/thr/document/48HansS_20080805_00001376/flavell-te-ururoa-aquaculture-legislation-amendment-bill

- Henare, M. (2014). The Economy of Mana. In D. Cooke, C. Hill, P. Baskett, & R. Irwin (Eds.), *Beyond The Free Market: Rebuilding a Just Society in New Zealand* (pp. 65–69). Dunmore .
- Hlawati, I. H. (2002). Loko i'a: A Legal Guide to the Restoration of Native Hawaiian Fishponds Within the Western Paradigm. *University of Hawai'i Law Review*, 24(2), 657–692.
- Jackson, A.-M. (2013). Erosion of Māori Fishing Rights in Customary Fisheries Management. *Waikato Law Review*, 21, 59–75.
- Keane, B. (2007). *Te hopu tuna – eeling - Catching piharau – lampreys*. Te Ara - the Encyclopedia of New Zealand. <http://www.TeAra.govt.nz/en/photograph/13987/utu-piharau-lamprey-weir>
- Kenny, G. (2011). Adaptation in Agriculture: Lessons for Resilience From Eastern Regions of New Zealand. *Climatic Change*, 106(3), 441–462. <https://doi.org/10.1007/s10584-010-9948-9>
- Kepkiewicz, L., & Dale, B. (2019). Keeping 'our' land: property, agriculture and tensions between Indigenous and settler visions of food sovereignty in Canada. *The Journal of Peasant Studies*, 46(5), 983–1002. <https://doi.org/10.1080/03066150.2018.1439929>
- Lindsay, B. T., Reid, J., Catska, P., Varona, G., & Rout, M. (2018). Development of indigenous enterprise in a contemporary business environment – the Ngāi Tahu Ahikā approach. *Journal of Enterprising Communities: People and Places in the Global Economy*, 12(4), 454–471. <https://doi.org/10.1108/JEC-05-2016-0014>
- Maniapoto Māori Trust Board. (2015). *He Mabere Ika - Maniapoto Upper Waipā River - Fisheries Plan 2015*. <https://researchspace.auckland.ac.nz/bitstream/handle/2292/25512/Maniapoto%20Upper%20Waipa%20River%20Fisheries%20Plan%202015.pdf?sequence=7>
- Martens, T. (2015). *Good News In Food - Understanding the value and promise of Indigenous food sovereignty in western Canada* [Master of Environment]. The University of Manitoba.

- Matakana & Rangiwaea Island. (2012). *Matakana and Rangiwaea Island's Hapū Management Plan - Part 1*.
https://www.boprc.govt.nz/media/285431/HMP-Matakana-Rangiwaea-Hapu-Management-Plan-as-submitted-on-7-November-2012-FINAL_Part1.pdf
- Mclellan, G. (2020). *Balancing Moni Hua and Mana Motuhake Iwi Commercial Food Ventures and Māori Food Sovereignty A Whakatōhea Case Study*. University of Auckland.
- Mikaere, A. (2011). *Colonising myths - Māori realities he rukuruku whakaaro*. Huia.
- Millin, A. (2020). *Indigenous Aquaculture: A Tool to Support Food Security*.
<https://escholarship.org/uc/item/9r00g9kc>
- Ministry for Primary Industries. (2020). *The New Zealand Government Aquaculture Strategy*. Ministry for Primary Industries. <https://www.mpi.govt.nz/dmsdocument/15895-The-Governments-Aquaculture-Strategy-to-2025>
- Moana Rāhui o Aotea. (n.d.). *Pātiki (Flounder)*. Aotea Harbour. Retrieved November 22, 2023, from <https://aotea.maori.nz/catching-and-drying-patiki-flounder>
- Museum of New Zealand. (n.d.). *Traditional knowledge and the kōura nursery cycle*. Museum of New Zealand - Te Papa Tongarewa. Retrieved April 10, 2024, from <https://www.tepapa.govt.nz/discover-collections/read-watch-play/crustaceans-aotearoa-new-zealand-and-south-pacific/traditional>
- New Zealand Companies Office. (2024, February 29). *Whakatōhea Mussels Ōpotiki Limited - Shareholdings*. New Zealand Companies Register. <https://app.companiesoffice.govt.nz/companies/app/ui/pages/companies/5351102/shareholdings?backurl=H4sIAAAAAAAAAAC2MPQvCQBBEf02uSZFKsFkkKNikE AxYD3eLF8x9eLsn5N97hHQzj3kzZLxZBptCRlxaEkax%2FhKSYxJFdCjO6JaZOOqibWK%2B9PL4QLvrqTvfPKMPVYRX6Q3cD9GyeyDySloqm13b5vYgNE7T0Z8KrXlvqeYd%2FwHOioxFiAAAAA%3D%3D>

- Ngā Puna Waihanga - Waitaha Tai Poutini. (2003). *Puawaitanga o te Ringa - Fruits of our busy hands*.
<https://christchurchcitylibraries.com/Maori/Puawaitanga/Puawaitanga.pdf>
- Pinkerton, M. H. (2018). Impacts of climate change on New Zealand fisheries and aquaculture. In B. F. Phillips & M. Perez-Ramirez (Eds.), *Climate Change Impacts on Fisheries and Aquaculture: A Global Analysis* (Vol. 1, pp. 91–119). John Wiley & Sons, Ltd.
<https://doi.org/10.1002/9781119154051.ch5>
- Robin-Middleton, J. (2019). *How to prep a hāngi - A framework for end-user engagement within the design process* [Master of Architecture]. Victoria University of Wellington.
- Rongonui, R., Tamakehu, B., Albert, G., Tuterangiwhiu, T. R., Ratana, K., & Rolleston-Gabel, T. (2023). *He Pou Kai Awha - Insight Into Knowledge and Context of Hapū-Based Aquatic Cultivation Practice and Functioning Systems*. Whakaika Research Collective.
<https://www.sustainableseaschallenge.co.nz/assets/dms/Reports/Whakaika-te-Moana/He-Pou-Kai-Awha/He-Pou-Kai-Awha.pdf>
- Ronogui, R., Bubby, A. G. T., Tamakehu, S., Tuterangiwhiu, T. R., Ratana, K., Rolleston-Gabel, T., & Van Kampen, P. (2023). *He Poutokomanawa - Insight into the Barriers and opportunities for hapū-based aquatic cultivation practice*. Whakaika Research Collective.
<https://www.sustainableseaschallenge.co.nz/assets/dms/Reports/Whakaika-te-Moana/He-Poutokomanawa/He-pou-tokomanawa.pdf>
- Ross, P., Tuterangiwhiu, T. R., Taikato, V., Forde, J., & Earle, H. (n.d.). *Mara Mātaitai - Māori Seafood Gardens*. Mara Mātaitai - Māori Seafood Gardens. Retrieved April 10, 2024, from <https://www.seagardens.net/mara-mataitai>
- Rout, Matt, & Paul Mika, J. (2019). *Mapping the Māori marine economy Financial capability of Māori entrepreneurs View project Whai Rawa, Whai Mana, Whai Oranga: Creating a world-leading indigenous blue economy View project*. <https://doi.org/10.13140/RG.2.2.17717.22243>

- Rout, Matthew, Reid, J., Bodwitch, H., Gillies, A., & Davies, K. (2019). *Māori marine economy: A literature review*. unknown. <https://doi.org/10.13140/RG.2.2.28622.41281>
- Rout, Matthew, Reid, J., Mika, J. P., Whitehead, J., Gillies, A., Wiremu, F., McLellan, G., & Ruha, C. (2024). Indigenising the blue economy in Aotearoa New Zealand. *Marine Policy*, 161(105987), 105987. <https://doi.org/10.1016/j.marpol.2023.105987>
- Shelling, M. (2023). *Kai security - A Kaupapa Māori critique and reconceptualisation of food security and food sovereignty definitions and assessment frameworks in Aotearoa* [Doctor of Philosophy, The University of Auckland]. <https://doi.org/10.1016/j.adhoc.2022.102894>
- Shine Collective. (n.d.). *Te Kete Rau Kotahi / Kaupapa Māori Aquaculture: Kāhui Aquaculture Framework - Smart Maori Aquaculture*. Retrieved April 10, 2024, from <https://smartmaoriaquaculture.co.nz/2023/09/29/1350/>
- Short, K., Stancu, C., Peacocke, L., & Diplock, J. (2023). *Developing blue economy principles for Aotearoa New Zealand* (Vol. 22). Sustainable Seas National Science Challenge. <https://doi.org/10.1007/s40152-023-00321-5>
- Simon, H. H. (2016). Te Arewahana Kei Roto i Te Rūma: An Indigenous Neo-Disputatio on Settler Society, Nullifying Te Tiriti, 'Natural Resources' and Our Collective Future in Aotearoa New Zealand. *Te Kaharoa*, 9, 54–119. <https://doi.org/10.24135/tekaharoa.v9i1.6>
- Sutton, N., Jennings, C., Greig, K., & Walter, R. (2022). *Archeological Assessment for Coring in the Wairau Lagoons*. University of Otago. <https://www.rangitane.org.nz/wp-content/uploads/2022/03/20220316-GNS-Wairau-Lagoons-Assessment.pdf>
- Taiapa, K., Barnes, H. M., & Mc Creanor, T. (2021). Mārakai as Sites of Ahi Kaa and Resistance. *Mai Journal A New Zealand Journal of Indigenous Scholarship*, 10(2), 148–158. <https://doi.org/10.20507/MAIJournal.2021.10.2.8>

- Te Arawhiti. (n.d.-a). *Eastern Bay of Plenty*. Te Arawhiti - The Office For Māori Crown Relations. Retrieved May 21, 2024, from <https://tearawhiti.govt.nz/te-kahui-takutai-moana-marine-and-coastal-area/applications/eastern-bay-of-plenty/>
- Te Arawhiti. (n.d.-b). *Western Bay of Plenty*. Te Arawhiti - The Office For Māori Crown Relations. Retrieved May 21, 2024, from <https://tearawhiti.govt.nz/te-kahui-takutai-moana-marine-and-coastal-area/applications/western-bay-of-plenty/>
- Te Puni Kōkiri. (2007). *Te Whakataunga Abumoana - The Aquaculture Settlement*. Te Puni Kōkiri.
- The Waitangi Tribunal. (1988). *Muriwhenua Fishing Report*. The Waitangi Tribunal. https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_68478237/Muriwhenua%20Fishing%20Report%201988.compressed.pdf
- The Waitangi Tribunal. (1992). *The Ngāi Tahu Sea Fisheries Report 1992*. The Waitangi Tribunal. https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_68472628/NT%20Sea%20Fisheries%20W.pdf
- Tuterangiwhiu, T. R. (2023, March). *Whakaika Te Moana*. Te Au o Te Moana Conference 2023, Pōneke. Youtube. https://www.youtube.com/watch?v=HWHi913p3oE&list=PLcP5oYqZClK4b_8xCjBOlaE1UQBqvIeei&index=42
- Tuterangiwhiu, T. R., Taiapa, C., Ratana, K., & Van Kampen, P. (2021). *Research Proposal - Whakaika Te Moana*. <https://www.sustainableseaschallenge.co.nz/assets/dms/Proposals/Whakaika-te-Moana/Whakaika-te-Moana-project-proposal-webversion.pdf>
- Waitangi Tribunal. (2002). *Abu Moana: The Aquaculture and Marine Farming Report*. Waitangi Tribunal. https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_68004143/Ahu%20Moana.pdf

- Wakefield, B., Gregory, B., Hape, M., & Hepere, J. (2013). *Cultural Impact Assessment of the Ruataniwha Water Storage Scheme*. Hawkes Bay Regional Council. <https://www.hbrc.govt.nz/assets/Document-Library/RWSS-Final-RMA-Reports/Assessment-Reports/RWSSA5b-Zone-M-CIA-Addendum-Taiwhenua-o-Tamatea-April-2013.pdf>
- Walker, R. (2007). *Ōpōtiki-Mai-Tawhiti: Capital of Whakatōhea*. Penguin Books.
- Whaanga, H., Wehi, P., Cox, M., Roa, T., & Kusabs, I. (2018). Māori oral traditions record and convey indigenous knowledge of marine and freshwater resources. *New Zealand Journal of Marine and Freshwater Research*, 52(4), 487–496. <https://doi.org/10.1080/00288330.2018.1488749>
- Whakatōhea. (1993). *Tawharua o nga hapu o Whakatōhea - Whakatōhea Resource Management Plan*. Whakatōhea. <https://atlas.boprc.govt.nz/api/v1/edms/document/A3557765/content>
- Whyte, K. P. (2016). Indigenous Food Sovereignty, Renewal, And US Settler Colonialism. In M. Rawlinson & C. Ward (Eds.), *The Routledge Handbook of Food Ethics* (pp. 354–365). Routledge. <https://doi.org/10.4324/9781315745503>
- Williams, J. (2016). Seafood “Gardens.” *The Journal of the Polynesian Society*. *Polynesian Society*, 125(4), 433–444. <https://doi.org/10.15286/jps>.