

# Chapter 15

## Empowering Indigenous Community Engagement and Approaches in Lake Restoration: An Aotearoa-New Zealand Perspective



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**Abstract** The Treaty of Waitangi forms the underlying foundation of the Crown–Māori relationship with regard to freshwater resources in Aotearoa-New Zealand. While there is no “one” Māori world view, there are principles and values that establish and reinforce whānau, hapū, rūnanga and iwi identity, and their responsibilities and rights to manage and use natural resources, including lakes. Lake restoration approaches that are grounded in tikanga Māori and Māori values and perspectives, and are co-designed to be responsive to the needs and aspirations of Māori, will ensure that outcomes are useful and of benefit to the participating indigenous community. The resulting outcomes are more likely to strengthen and add value to existing community initiatives, thus increasing efficiencies when capacity and capability across different expertise is in demand. This requires a commitment (by agencies and funders) to move beyond conventional understandings of who is “qualified” to engage in lake research and restoration initiatives. While hapū, rūnanga and iwi undoubtedly benefit from having their members qualify by being active participants in lake research and restoration efforts, in this chapter we emphasise the need for a more holistic approach that recognises and empowers whānau to engage as co-governors, co-leaders, researchers, as knowledge holders and as teachers. A truly collaborative lake restoration programme will provide multiple roles for Māori, including the development and implementation of monitoring and evaluation approaches.

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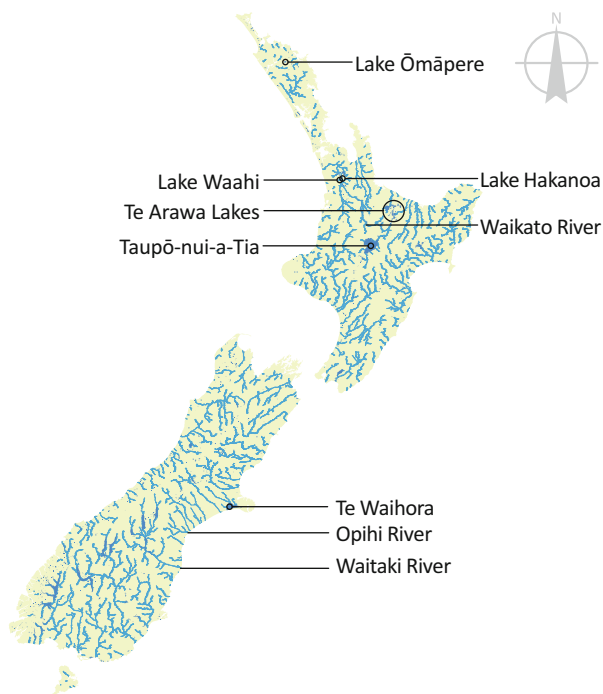
## 15.1 About This Chapter

Many whānau (family groupings) have, and continue to work tirelessly to protect, restore and rehabilitate our taonga and the cultural, social, ecological and economic services provided by Aotearoa-New Zealand's lake ecosystems to their local communities, the nation and our future generations. This chapter aims to provide an insight into Te Ao Māori (Māori world view) and the cultural values, uses, and opportunities which underpin the aspirations of whānau, hapū (tribal grouping that consists of whānau), and iwi (extended tribal grouping that consists of whānau and hapū), in lake restoration, and the processes through which they should be engaged. We encourage readers to source the cited references for a more in-depth understanding of Māori cosmology, principles, concepts and the tribal and catchment histories touched on in this chapter.

Māori have particular interests in fresh water, having traditional and cultural connections with freshwater resources, as well as economic interests. Water is a taonga of paramount importance with attendant rights, interests and responsibilities. The Treaty of Waitangi (Te Tiriti o Waitangi) forms the underlying foundation of the Crown–Māori relationship with regard to freshwater resources (Iwi Advisory Group (Freshwater) 2015). In June 2009 the New Zealand government announced the New Start for Fresh Water strategy, setting out the new direction for the management of fresh water and the intended process for progressing policy development. A national hui (gathering) on freshwater was held in December 2009 to bring iwi and hapū representatives together to discuss the rights and expectations of iwi and hapū concerning freshwater. A keynote presentation delivered by the Honourable Dr Pita Sharples at this hui is referenced throughout this chapter to illustrate the desire of Māori for tenable and long-term solutions in respect of the management of our freshwater resources.

A map is provided to show the locations of the waterways discussed in this chapter (Fig. 15.1). In Te Reo Māori (the Māori language), either a macron or a double vowel is used to indicate long vowels. As Waikato-Tainui use a double vowel we have followed this protocol when we discuss lakes in the Waikato-Tainui rohe (tribal area). Macrons have been used elsewhere. A glossary is provided at the end of this chapter.

**Fig. 15.1** Locations of the Aotearoa-New Zealand lake catchments and waterways featured in this chapter  
(Source: Erika Mackay)



## 15.2 Introduction

Kei te ora te wai, kei te ora te whenua, kei te ora te tangata  
(The water is healthy, the land and the people are nourished)

This is a truth which speaks across the universe, reflecting that the health of life on and within Papatūānuku is directly related to the wellbeing of our waters. (Pita Sharples, December 2009)

Aotearoa-New Zealand's lakes are core national assets providing significant cultural, economic, social, and environmental benefits. Competition for the use of these freshwater resources is intensifying, and many of our lake and river ecosystems are now degraded, reducing their inherent values and services they provide for society. The health, integrity and sustainability of ancestral lands, waters, forests, mahinga kai (food gathering place), wāhi tapu (sacred place) and nohoanga (dwelling place) are critical social and biophysical determinants of the health and wellbeing of ecosystems, Māori people and Māori communities (Ngā Pae o Te Māramatanga [undated](#)) as illustrated by the whakataukī (proverb) above used by the Honorable Pita Sharples to open his keynote speech at the Iwi Māori National Summit on Freshwater Management in 2009.

The linkages between the natural world and Māori, the indigenous peoples of Aotearoa-New Zealand, are explained through genealogy, tribal narratives and mythology. Collectively, these relationships are known as whakapapa (connections, genealogies), and they represent how Māori place themselves within the world, and

how they understand and interact with everything around them (Environment Foundation 2018). Rivers, lakes and streams are intimately bound to people through whakapapa and are a fundamental tenant of Māori personal and tribal identity. Māori have a special relationship with Papatūānuku (the Earth Mother) and her resources—as an integral part of the natural order and as recipients of her bounty, rather than as controllers and exploiters of their environment. Papatūānuku is to be treated with reverence, love and responsibility rather than abuse and misuse (Marsden 2003). Therefore, for Māori the environment and associated natural resources are taonga (significant treasure), and how they engage with it is crucial to their integrity, sense of unique culture and ongoing ability to keep tikanga (correct procedure, custom, lore) and practices alive (e.g. Te Rūnanga o Ngāi Tahu 2013) (for example, see Case Study 15.1).

### 15.3 Māori Values and Practices

We all know that providing for a stronger Māori voice in decision-making over water is an excellent way to make progress. Progress will be rapid if the ethic of kaitiakitanga is welcomed to the centre of the debate around freshwater management. And in turn, the contribution that tāngata whenua can make towards sustainably managing our water resources will be of benefit to all New Zealanders. (Pita Sharples, December 2009)

Māori have an intricate, holistic and interconnected relationship with the natural world and its resources. While there is no “one” Māori world view, there are principles and values that establish and reinforce whānau, hapū, rūnanga (tribal assembly) and iwi identity, their responsibilities and rights to manage and use natural resources, including lakes (Table 15.1). To sustain their mana (prestige, authority, status), kaitiaki (guardians) are bound to do everything they can to preserve and restore the mauri (life force) of their environment. Mauri, an internal energy or life force derived from whakapapa is an essential essence sustaining all forms of life. Thus it provides life, vitality and energy to all living things and is the binding force that links the physical to the spiritual worlds. It denotes a health and spirit that permeates all living and non-living things and damage or contamination to the environment is therefore damage to or loss of mauri (Awatere and Harmsworth 2014).

Te Wai Māori (2008) established as part of the Māori Fisheries Settlement to advance Māori interests in freshwater fisheries, explains that Māori regulated fresh waters and freshwater fisheries through a series of adaptive and considered actions by tohunga (expert, specialist), kaitiaki, whānau and hapū, as a vital resource for pā (traditional settlement) and kāinga (home, village). These actions were developed in response to intergenerational observational learnings, and practices to maintain sustainability of use for current and future generations. Complex relationships, tohu and understandings of ecosystems were utilised to inform management options, including the use of rāhui (a kind of prohibition) for temporary restrictions and tapu (restriction) for more permanent bans on the use of resources. An example of a rāhui

**Table 15.1** Examples of how Māori values and important Māori environmental concepts form the basis for Māori perspectives when seeking to assess and understand ecosystems, and how a degraded lake ecosystem can impact Māori practices (adapted from Stewart et al. 2014)

| Te Waihora whānau value | Brief description                                                                                                                                                                                                                                                                                             | Example of how this value is expressed by Te Waihora whānau (Stewart et al. 2014)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Examples of how a degraded lake environment can impact Te Waihora whānau values (Stewart et al. 2014)                            |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Whakapapa               | Connection, lineage, or genealogy between humans and ecosystems and all flora and fauna. Māori seek to understand the total environment or whole system and its connections through whakapapa, not just part of these systems, and their perspective is holistic and integrated (Harmsworth and Awatere 2013) | Whānau members who participated in the Te Waihora Contaminants in Mahinga Kai study (Stewart et al. 2014) describe whakapapa ties to Te Waihora which are maintained through continued use of the area. Such links confirm and encourage the relationship between individuals, the hapū and the iwi, and the lands and waters of Te Waihora. Whakapapa connections with Te Waihora are evident in the following ways: through collective ownership of the lakebed of Te Waihora, and a role in collaborative management, as well as an evolving role of co-governance; through the names of tūpuna (ancestors) or important iwi/hapū events that have been given to geographical locations and landmarks; through the restoration/revitalisation of traditional practices, such as mahinga kai, within whānau | Environmental degradation and contamination issues could potentially limit the success of cultural revitalisation initiatives    |
| Whanaungatanga          | Whanaungatanga refers to the reciprocal support relationship between members of the same whānau, hapū and iwi                                                                                                                                                                                                 | As well as a place to work whānau talk about Te Waihora as a place to play, explore, socialise and bond (Stewart et al. 2014). Wild kai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Changing practices, driven in part by perceived adverse effects of contamination, are having a detrimental effect on whānau. For |

(continued)

**Table 15.1** (continued)

| Te Waihora<br>whānau value | Brief description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Example of how this<br>value is expressed by Te<br>Waihora whānau<br>(Stewart et al. 2014)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Examples of how a<br>degraded lake<br>environment can<br>impact Te Waihora<br>whānau values<br>(Stewart et al. 2014)                                                                                                                                                                                                                                                                                                   |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | (food) gathering activities, (along with most other activities on Te Waihora) provided a forum for whakawhanaungatanga amongst different generations—where events, people, flora and fauna, atua (deities), kawa (protocols, rituals) and tikanga associated with Te Waihora were recounted and woven together                                                                                                                                                                                                                                                                                                                                        | example, one interviewee advised that they no longer eat wild kai from the lake, and would no longer share it with others because of the perceived health risk                                                                                                                                                                                                                                                         |
| Mātauranga<br>Māori        | Mātauranga Māori is a holistic perspective encompassing all aspects of knowledge and seeks to understand the relationships between all component parts and their interconnections to gain an understanding of the whole system. It is based on its own principles, frameworks, classification systems, explanations and terminology. Similarly to western knowledge, mātauranga Māori is a dynamic and evolving knowledge system and has both qualitative and quantitative aspects (Tipa et al. in press) | Through the interaction of different generations and wider whānau networks, each of which has experienced different periods and conditions of environmental health, Ngāi Tahu whānau have a broad and often detailed knowledge of the social, cultural, environmental, and economic history of the Te Waihora area, and of their own family's connection to the lake. These teachings embody the knowledge of how to gather, prepare, preserve, distribute, and employ mahinga kai in gatherings and ceremonies—learning from kaumātua (elders). For many, knowledge transmission is of the utmost value to sustaining their community, their culture | With fewer areas open for harvest, the number of healthy mahinga kai populations declining, the amount of wild kai being introduced into the sharing network is dwindling. Whānau members, particularly kaumātua, are no longer able to obtain the types and amounts of kai that they desire, and many confirmed that some species are now only eaten on special occasions. Knowledge may be lost over the generations |

(continued)

**Table 15.1** (continued)

| Te Waihora<br>whānau value | Brief description                                                                                                                                                                                                                                                                  | Example of how this<br>value is expressed by Te<br>Waihora whānau<br>(Stewart et al. 2014)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Examples of how a<br>degraded lake<br>environment can<br>impact Te Waihora<br>whānau values<br>(Stewart et al. 2014)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manaakitanga               | Hospitality, show kindness and respect to, look after. By nurturing and caring for our natural environment we ensure that it is able to provide us with the resources we require to provide hospitality to our manuhiri, kaumātua and whānau members (Awatere and Harmsworth 2014) | The fundamental components of manaakitanga (the process of showing respect, generosity and caring for others) are to be able to manaaki (to take care of) those in the takiwā (area, district) through the provision of safe resources, such as wild kai being safe to eat, and water being of a quality that is safe for use (e.g. drinking water) and interaction (e.g. swimming or setting nets). Another aspect centres on use of natural resources for which the lake is renowned at gatherings (i.e. culturally important ceremonies). Such gatherings are the best way to maintain and reinforce ties with other hapū members and members of the wider community. Gatherings may be especially important to kaumātua, many of whom obtain much of their wild kai at these events throughout the year | Lower availability (abundance) and loss of access directly influences mahinga kai gathering practices, and therefore manaakitanga. When wild kai is not available or accessible, and/or are contaminated, other foods are substituted, usually processed foods. These foods do not hold the same significance as traditional foods which may lead to whānau feeling a sense of loss. Further some whānau may not be able to afford it financially. In a culture where the importance of sharing food is fundamental, the insult of not being able to provide kai or potentially sharing contaminated kai is a heavy burden to bear |
| Kaitiakitanga              | The exercise of customary custodianship, in a manner that incorporates spiritual matters, by those who hold mana whenua (mana held by local people) status for a particular area or resource                                                                                       | In Stewart et al. (2014), interviewees expressed extremely strong concern for the state of Te Waihora—they believe it is degraded and in a state that is unacceptable. This concern comes from a number of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Kaitiakitanga is an intergenerational responsibility. This is achieved through those who are mandated as kaitiaki utilising rules, management techniques and strategies developed from a                                                                                                                                                                                                                                                                                                                                                                                                                                           |

(continued)

**Table 15.1** (continued)

| Te Waihora<br>whānau value | Brief description | Example of how this<br>value is expressed by Te<br>Waihora whānau<br>(Stewart et al. 2014)                                                                                                                                                                                                                                                                                                                          | Examples of how a<br>degraded lake<br>environment can<br>impact Te Waihora<br>whānau values<br>(Stewart et al. 2014)                                                                                                         |
|----------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                   | perspectives emanating from the concept and practice of kaitiakitanga (exercising customary custodianship), which encompasses the management, use, and nurturing of environments in ways that protect mauri while supporting the cultural health of mana whenua. Whānau want to be actively involved in authoritative and legitimate management of Te Waihora to sustain both its intrinsic and instrumental values | long-term and wide-spread tacit association with the environment which are consistent with mana whenua values, beliefs and cultural norms. If kaitiakitanga is not effective this may lead to whānau feeling a sense of loss |

to preserve the tuna (eel) resource has been recorded from the Waikato region in the 1850s. It is said that the tuna availability in two main riverine lakes (Lakes Waahi and Hakanoa) was declining due to over-harvesting. In response to this, the local rangatira (chief, leader) Pōtatau Te Wherowhero placed a rāhui over the whole area for a period of time to prevent over-fishing and enable the stocks to recover. When the rāhui was lifted there was a mass celebration and a haka (ceremonial dance) to lift the tapu and make the lake noa (free from tapu) again, which is how Lake Hakanoa was named. Additionally, Raahui Pookeka is the original Māori place name for the Huntly area where these lakes are located as a reference to this time.

Water formed part of an undivided entity and holistic view of the rohe they controlled, whereby Māori did not sharply distinguish between land and water (foreshore, lakes, lagoons, rivers, swamps) (Waitangi Tribunal 1997). Since colonisation, this Māori concept of water as an undivided entity has been systematically fragmented (Te Wai Māori 2008). The practices of early Pākehā settlers more often than not conflicted with Māori values and practices. A number of activities such as the draining of wetlands, lowering of lakes, transportation of logs down rivers which destroyed pā tuna (eel weirs), building hydro-dams, and the introduction of trout, which decimated indigenous species of fish, destroyed Māori rights, interests and traditional practices (e.g. White 1998; Bargh 2006; Coombes 2007; McDowall 2011). For example, as native fish species have declined, out of necessity Ngāti Tūwharetoa have turned to trout as mahinga kai. Trout have therefore become a

valued supplement to whānau and marae dining tables as well as a means to provide for manuhiri (visitors) and to carry out traditional fishing practices. Iwi and Māori still maintain tino rangatiratanga (the power to act with ultimate authority) over water and seek to manage as an undivided and indivisible entity. However, the impact of colonisation and the subsequent imposition of a statutory regime have meant that Māori have had to adapt and develop a completely different way of managing freshwater resources (Te Wai Māori 2008).

The interconnected Māori model of river, lakes, swamps, lagoons, river/lake beds and the adjoining land has been fragmented and replaced with a Pākehā (European New Zealanders) model that has strong rules about land ownership with water being a common commodity. For example, early statutes such as the Water Power Act 1903 vested in the government the “sole right to use water in lakes, falls, rivers or streams” for the purposes of generating electricity. Māori claims to ownership of rivers were disregarded by the Coal Mines Amendment Act 1903 when the government vested the beds of navigable rivers in the Crown despite an assurance earlier in the year that such a provision would be subject to “other rights lawfully held” (Durie 2004). Also the Water and Soil Conservation Act 1967 vested in the Crown the “sole right to dam any river or stream, or to divert or take natural water, or discharge natural water or waste in to any natural water, or use natural water” (Te Wai Māori 2008). The conflicting positions regarding the holistic and equitable management of New Zealand’s natural resources continues to create tensions between these two world views (e.g. Prystupa 1998; Coombes 2007).

## 15.4 Recognising the Rights, Interests and Perspectives of Māori

The Treaty of Waitangi forms the underlying foundation of the Crown–Māori relationship with regard to freshwater resources. There exists a shared interest and desire for tenable and long-term solutions in respect of the management of freshwater resources. The ability of Māori to act as tangata tiaki, to ensure that water is protected and used wisely, is to a large degree dependent on there being a legal framework that provides a meaningful role for Māori in the governance of freshwater. It is critical that arrangements for the governance and management of freshwater recognise the rights, interests and perspectives of Māori. (Pita Sharples, December 2009)

Treaty of Waitangi settlements between iwi and the Crown have resulted in some assets of strategic importance to the nation being placed under Māori ownership and/or management (Māori Economic Development Panel 2012), many of which are in a degraded state. Many settlements now include cultural redress which is concerned with the protection, restoration or rehabilitation of values, uses and services (and at scales) that have not previously been a strategic priority for research, restoration and monitoring by agencies. Treaty settlements which have cultural redress mechanisms within them with respect to lakes include Ngāi Tahu (Wai 27, Waitangi Tribunal 1991), Ngāti Tūwharetoa (Wai 1200, Waitangi Tribunal

**Table 15.2** Provisions specific to lakes extracted from the Ngāi Tahu Claims Settlement Act 1998

| Mechanism in Ngāi Tahu Claims Settlement Act 1998                | Lakes affected by mechanism                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Placename changes                                                | Lakes Grassmere/Kapara Te Hau, Alabaster/Wāwāhi Waka, McKerrow/Whakatipu Waitai, Alpine Lake/Ata Puai, Browning/Whakarewa, Lanthe/Matahi                                                                                                                                                         |
| Vesting of land (under Reserves Act 1977)                        | Wairewa, Moeraki lake                                                                                                                                                                                                                                                                            |
| Statutory acknowledgements                                       | For 26 lakes, excluding coastal lagoons, and Sinclair wetlands                                                                                                                                                                                                                                   |
| Vesting of lakebed in Te Rūnanga o Ngāi Tahu                     | Te Waihora, Muriwai (Coopers Lagoon), Mahinapua                                                                                                                                                                                                                                                  |
| Joint management provisions, including joint management planning | Te Waihora, Muriwai (Coopers Lagoon)                                                                                                                                                                                                                                                             |
| Nohoanga                                                         | Waitaki—Lake Alexandrina, Lake Benmore, Lake McGregor, Lake Tekapo, Lake Ruataniwha, Lake Ohau; Canterbury—Lake Sumner; Otago—Lake Hawea, Lake Wakatipu, Lake Wanaka; Southland—Lake Manapōuri, Lake Te Anau, Mavora Lakes; West Coast—Lady Lake, Lake Haupiri, Lake Kanieri, Lake Brunner Moana |
| Vesting of land—fee simple                                       | Sinclair wetlands, leases around Te Waihora                                                                                                                                                                                                                                                      |
| Power to make bylaws                                             | Te Waihora, Mahinapua, Muriwai                                                                                                                                                                                                                                                                   |
| Statutory appointments to Boards                                 | Guardians of Lake Wanaka, Guardians of Lake Manapōuri, Monowai, Te Anau                                                                                                                                                                                                                          |

These are provisions that are specific to lakes. We acknowledge that there are other generic provisions that relate to mahinga kai, customary fisheries, taonga species that will also benefit lake management, including restoration

2008) and Te Arawa (Wai 240, Office of Treaty Settlements 2006). Models of co-management such as the Waikato Tainui Deed of Settlement and Te Ture Whaimana, the Vision and Strategy for the Waikato River, set a shared and agreed vision for the restoration of the catchment, while other settlements such as the Te Arawa Lakes Settlement Act provides for ownership of 13 Te Arawa lakebeds and a role in management (see Case Study 15.2).

A range of provisions that recognise the rich multilayered association of whānau with lake environs are found in the Treaty Settlements and range from comprehensive co-governance requirements to reinstatement of traditional place names. In the case of Ngāi Tahu, which has the majority of its papatipu marae on the coast, nohoanga are vitally important for reconnecting with inland waterways and reinstating patterns of use. Reinstatement of place names is another tangible means of re-establishing cultural presence. As an example, in Table 15.2 we list some of the provisions from the Ngāi Tahu Claims Settlement Act 1998 that are specific to South Island lakes.

In many cases Treaty Settlements have been the key drivers in the provision of new innovative approaches and bringing together multiple knowledge systems to inform co-management regarding values, species, catchments, and/or at scales that

have not previously been prioritised by agencies. As a result of the Waikato-Tainui Deed of Settlement in relation to the Waikato River, Te Ture Whaimana o te Awa o Waikato (the Vision & Strategy) is the primary direction setting document for the Waikato River catchment (including all lakes), it states:

Our vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come.

In order to realise the Vision the following objectives are being pursued by Waikato-Tainui:

- (a) the restoration and protection of the health and well-being of the Waikato River;
- (b) the restoration and protection of the relationship of Waikato-Tainui with the Waikato River, including their economic, social, cultural and spiritual relationship;
- (c) the integrated, holistic and co-ordinated approach towards decisions that may result in significant adverse effects on the Waikato River;
- (d) the adoption of a precautionary approach towards decisions that may result in significant adverse effects on the Waikato River, and in particular those effect that threaten serious or irreversible damage to the Waikato River;
- (e) the recognition and avoidance of adverse and potential cumulative effects of activities undertaken both on the Waikato River and within its catchment on the health and well-being of the Waikato River;
- (f) the recognition that the Waikato River is degraded and should not be required to absorb further degradation as a result of human activities;
- (g) the protection and enhancement of significant sites, fisheries, flora and fauna; and
- (h) the application to the above of both mātauranga Māori (knowledge system) and the latest available scientific methods.

Te Ture Whaimana will prevail over any inconsistencies in other policies, plans or processes affecting the Waikato River catchment. Relevant policies, plans and processes (e.g. National Policy Statements issued under the RMA 1991; MfE 2014), Waikato Regional Policy Statement, district plans) cannot be amended so that they are inconsistent with Te Ture Whaimana and must be reviewed and amended, if required, to address any inconsistencies. As a result of the Waikato-Tainui Deed of Settlement the Waikato River Authority and Waikato Clean-up Trust were formed to allocate a \$220 million budget over a 30-year timeframe to achieve the Vision and Strategy and embrace a new era of co-management in respect of the Waikato River catchment as an appropriate way to secure the longer-term sustainability, health and well-being of the Waikato River for present and future generations.

Major changes have been seen in governance arrangements for freshwater management in Aotearoa-New Zealand as a result of Treaty Settlements (Tipa et al. 2016). The institutions through which Māori interact with the Crown, organisations and communities are multidimensional and varied across the country. These diverse governance arrangements reflect the imperative for local communities (agencies and

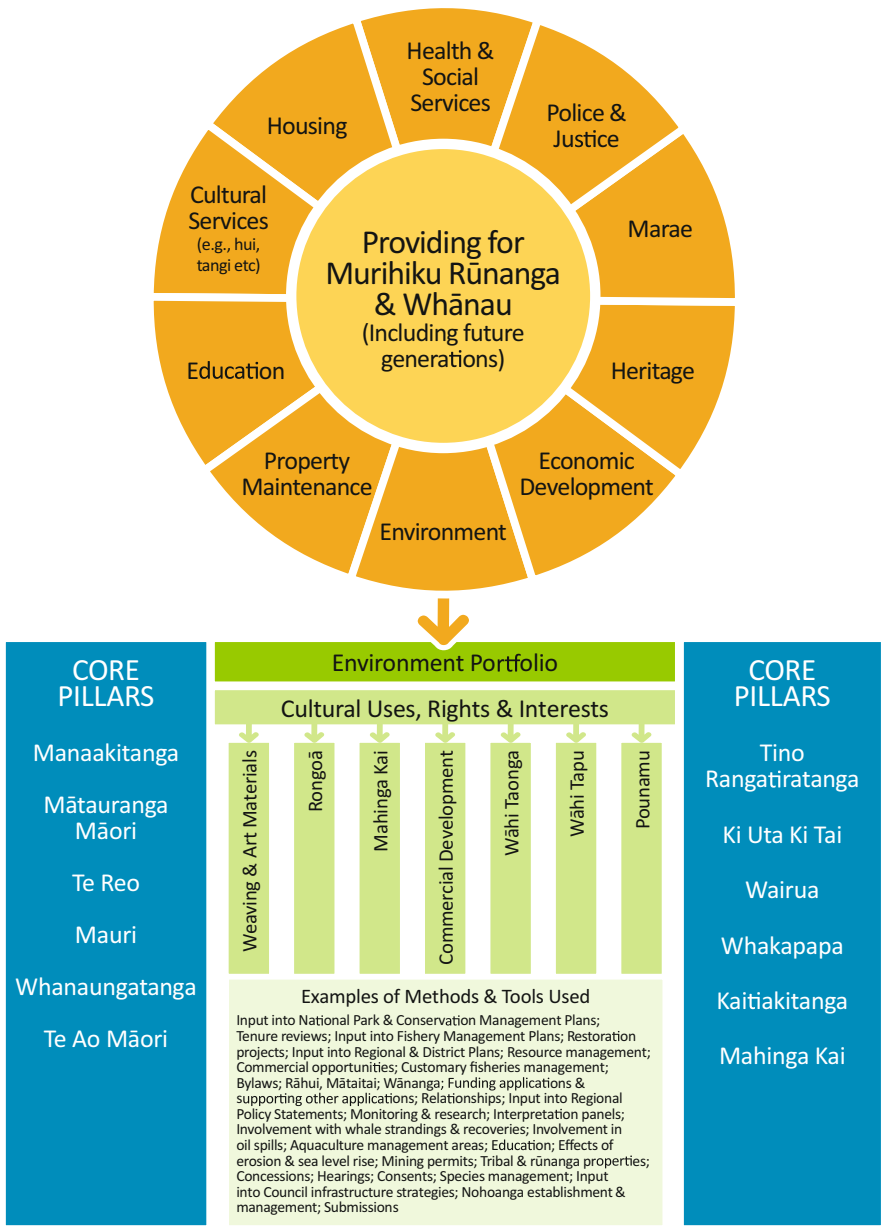
tāngata whenua) to dictate the arrangements that are made within their rohe, taking into account differences in capacity, how whānau and hapū choose to organise themselves, and how whānau prefer to interact with local government (Tipa et al. 2016). Crawford and Ostrom (1995) define “institutions” as a rule, norm, or strategy that incentivises certain behaviours. Institutions may be prescribed in legislation, policy or procedure, or they emerge informally as norms, operating practices, or habits. In the past, there was difficulty analysing these arrangements because they are frequently the invisible elements of the policy environment. Over the last 10–15 years Māori have become more familiar with their understanding of institutions, both formal and informal arrangements, and are affecting major changes in the Aotearoa-New Zealand freshwater landscape. For iwi, hapū and rūnanga there is also the challenge of having to manage multiple portfolios (Fig. 15.2), navigate multiple regulatory resource management frameworks (Fig. 15.3), and interact with multiple agencies; therefore, the capacity of parties to collaborate in freshwater decision-making must always be a consideration of environmental restoration, management and governance frameworks.

## 15.5 Empowering Māori Engagement and Approaches in Lake Restoration

Treaty of Waitangi settlements have proved a key driver for the active implementation of lake rehabilitation actions in recent years (e.g. Te Waihora, Te Arawa Lakes, Taupō-nui-a-Tia). Co-management structures are intended to provide a strong legislative obligation for the government to empower Māori in the management and restoration of Aotearoa-New Zealand’s lakes. Iwi and hapū environmental and fisheries management plans, where they exist, should be the first point of call for external parties wishing to engage in research and restoration of a lake catchment.

While as mentioned previously there is no “one” Māori world view, indigenous research frameworks, such as that proposed by Kovach (2009) (Fig. 15.4) can provide guidance to those who are unfamiliar with approaches that seek to empower communities to engage in environmental restoration approaches long term. Important components of Kovach’s framework that are applicable to the Aotearoa-New Zealand context include:

1. Researcher preparation (e.g. evidence submitted as part of Treaty Settlements, iwi/hapū environmental management plans, Deeds of Settlement, lake management/restoration strategies, catchment histories and familiarisation hīkoi (field trips) and kanohi-ki-te-kanohi (face-to-face) discussions with mana whenua);
2. Research preparation (e.g. indigenous partners collating and strategising lake management and restoration context to be addressed, co-development of actions plans, hypotheses and questions of mutual benefit);



**Fig. 15.2** (Left) overview of the multiple portfolios operated by Murihiku papatipu rūnanga; and (Right) the core pillars guiding the implementation of the environment portfolio and some examples of the services facilitated by Papatipu Rūnanga on behalf of, and in collaboration with, Murihuku whānau. The four Murihiku Papatipu Rūnanga are Te Rūnaka o Waihōpai Rūnaka, Te Rūnanga o Awarua, Te Rūnanga o Ōraka-Aparima and Te Rūnanga o Hokonui (Source: Kitson et al. 2014)



**Fig. 15.3** The hierarchy of agreements, acts, policies and plans that informs Te Ao Mārama Incorporated policy development and their expectations for resource management in Murihiku/Southland. Te Ao Mārama Incorporated has been mandated by the four Murihiku papatipu rūnanga (Te Rūnaka o Waihōpai, Te Rūnanga o Awarua, Te Rūnanga o Ōraka-Aparima, Te Rūnanga o Hokonui) (Source: Te Ao Mārama Inc)



**Fig. 15.4** (Centre) A conceptual indigenous research framework adapted from Kovach (2009). This approach has several characteristics, including: tribal epistemology, decolonising and ethical aims, researcher and research preparations, making meaning of the knowledge systems gathered, and giving back. Kovach (2009) describes the epistemology (in her case Nēhiyaw knowledge) as the nest that holds within it the potential properties for the research. (Outer circle) Some of the actions completed in the research programme Ngā Kete o Te Wānanga's progress (as of December 2015) to adapt and implement this indigenous research framework in the Murihiku and Waitaki takiwā

3. Decolonising and ethics (e.g. project principles developed by indigenous partnerships, co-development of methods/approaches, all parties resourced appropriately);
4. Gathering knowledge (e.g. respecting the contributions of multiple knowledge systems, including mātauranga Māori);
5. Making meaning (e.g. co-production of new knowledge relevant to the lake and indigenous community context); and

6. Giving back (e.g. co-delivery of presentations and publications, building joint track records and recognition in all research outputs/communications).

This is not a linear process—it requires periods of reflection and movement backwards and forwards through the process/conceptual framework. An example of how this framework is being applied in the Ministry for Business Innovation and Employment-funded Ngā Kete o te Wānanga: Mātauranga, Science and Freshwater Management research programme which is currently in progress with mana whenua in the Waitaki River, Opihi River and Murihiku/Southland takiwā (tribal area, district) is shown in Fig. 15.4.

### 15.5.1 *Mātauranga Māori*

We have an opportunity as a nation to set the standard high; to work with mātauranga Māori and western science in parallel, investing both with equal importance. (Pita Sharples, December 2009)

The diverse characteristics of Āotearoa-New Zealand's lakes (such as origin, geology, climate, water quality, and composition of flora and fauna) produced very different ecosystems that shaped and influenced the way whānau and hapū engaged with their cultural landscapes around the country. The social and economic well-being of Māori has long relied on the sustainable utilisation (including trade), and management of their local natural resources, where lake fisheries like tuna (freshwater eels), kōura (freshwater crayfish), kōaro and kākahi (freshwater mussels) were once key components of local and regional economies and helped to sustain communities with food and resources (e.g. Hiroa 1921; White 1998; Coombes 2007; McDowall 2011). Utilisation meant whānau engaged with their waterways in all weathers, in different seasons, and observed the environment in its many different states. Changing behaviours in response to changing conditions meant that whānau were well versed in the principles and practice of adaptive management. Through intergenerational interaction a wealth of knowledge and experiences that should be used to inform management and restoration has been generated.

There is an enormous potential for the use of mātauranga Māori to enhance our understanding of lake ecosystems, underpin culturally appropriate restoration approaches, and provide a more holistic and integrated perspective for monitoring, planning and policy. Māori have accumulated qualitative and semi-quantitative information about environmental changes in their lakes and customary resources such as freshwater fisheries, birds, plants and invertebrates, for generations. This information was collected using traditional and adaptive methods which are still relevant today. Although hapū and iwi hold various levels of mātauranga Māori it has rarely been used alongside more quantitative science-based approaches to better understand our lake ecosystems. In the few examples where this has occurred, the partnership between the two knowledge systems has been able to provide innovative, effective and practical tools for monitoring and to formulate powerful hypotheses and prioritisation of future research, restoration and management (for example, see Case Study 15.3).

### 15.5.2 *Well-Being and Culturally Relevant Spatial Scales*

This mindset, this world view, which is essentially the notion that all of our natural resources are inter-related, and intricately woven across our economic, cultural and spiritual aspirations, are part of the unique signature *tāngata whenua* have brought to this debate. (Pita Sharples, December 2009)

The Māori world view acknowledges a natural order to the universe, a balance or equilibrium, and that when part of this system shifts, the entire system is put out of balance. The diversity of life is embellished in this world view through the interrelationship of all living things as dependent on each other, and Māori seek to understand the total system and not just parts of it (Harmsworth and Awatere 2013). For generations Māori have emphasised the necessity of considering the environment in its entirety, a concept referred to as *Ki Uta Ki Tai* (Te Rūnanga o Ngāi Tahu 2003). *Ki Uta Ki Tai* refers to 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. This Māori resource management framework reflects that resources are connected, from the mountains to the sea, and must be managed as such. Within this framework, the overall health of a waterway can be affected by the deterioration at one point of its length, that is, what happens at one point can affect all parts of the catchment (Kitson et al. 2014). This concept is used by Ngāi Tahu to describe their holistic understanding of aquatic ecosystems and how the health and well-being of the people is intrinsically linked to that of the natural environment. The significance of that relationship, and therefore the implications of lake degradation, has been articulated as (Henwood and Henwood 2011):

[the] use of the lake is determined by the health of the lake, the health of the lake and the health and of the people are intertwined.

Furthermore, this concept reflects that we belong to the environment and are only borrowing the resources from our generations that are yet to come. It is considered our duty to leave the environment in as good as or even better condition than received from our *tūpuna* (Ngāi Tahu ki Murihiku 2008).

Te Roopu Taiao o Utakura was established in response to the declining state of their local environment. Their *rohe* includes the Utakura River and its tributaries, from the outflow of Lake Ōmāpere to Paremata near the entrance of the Hokianga Harbour. They are motivated by the *kaupapa* (theme, philosophy) to restore, protect and enhance their freshwater environment and fisheries—*Ma uta ki tai*. Implicit in their approach is the holistic, connectedness of people and places through the flow of water, the health of water systems and their resources, and the health and well-being of people as a consequence (Henwood and Henwood 2011; Henwood and McCreanor 2013) (see Case Study 15.4).

Māori well-being has long relied on the sustainable use, conservation and management of lake ecosystems. *Taonga* species like tuna, *kōura* and *kākahi* are integral to Māori socio-ecological systems and once sustained local and regional economies with food and resources (e.g. Hiroa 1921; McDowall 2011). These species support well-being through on-going creation and maintenance of *mātauranga* Māori,

intergenerational knowledge transfer, strengthening connections between whānau, marae, hapū and iwi, and with valued features of cultural landscapes (e.g. Panelli and Tipa 2007, 2008; Stewart et al. 2014). As these species are also vital for maintaining ecosystem integrity and function, due to their cultural and ecological importance these species fit characteristics described by Garibaldi and Turner (2004) as Cultural Keystone Species (CKS) (Noble et al. 2016). Cultural Keystone (Taonga) Species are fundamental in the customary practices and identities of Indigenous communities and as such they must be actively involved in their restoration and management to balance competing values, needs and opportunities. Indigenous peoples around the world are concerned about the decline of many CKS which has affected their subsistence economies, and their ability to sustain cultural fishing practices and knowledge. There are many examples of Indigenous peoples driving the improved management, restoration and conservation of lake fisheries, including kōura (see Case Study 15.3, Kusabs et al. 2015a), freshwater eels (e.g. McKinnon 2007; Williams et al. 2013; Waikato Raupatu River Trust 2014) and salmon (e.g. see Feature Box 15.1; Fraser et al. 2006; Galbreath et al. 2014). Noble et al. (2016) contend that with the recognition of Indigenous cultural keystone species, we take the first step towards improving freshwater access rights, and our management of freshwaters as resilient social-ecological systems for the benefit of all stakeholders.

### **Box 15.1 Fisheries Management in the Duck Valley Indian Reservation, USA**

Jinwon Seo

Department of Fish, Wildlife, and Parks, Shoshone-Paiute Tribes, Owyhee, NV, USA

There are approximately 310 Indian reservations and 566 recognised tribes in the United States. By area (1172.02 km<sup>2</sup>), the Duck Valley Indian Reservation of the Shoshone-Paiute Tribes (SPT) is one of the 50 largest Indian reservations in size. It was established on April 16, 1877, and is almost evenly divided between two states, Idaho (50.2%) and Nevada (49.8%). It was deemed sufficient to provide ample fish and wildlife resources for subsistence. The East Fork Owyhee River, located in northeastern Nevada, is a tributary of the Snake River and is the southernmost drainage to the Columbia River. The river runs through the reservation and produced native populations of anadromous fish including Chinook salmon and steelhead which historically migrated hundreds of miles from the Pacific Ocean, making these fishes a significant part of historical tribal food resources and culture. However, the Northwest Power and Conservation Council (NPCC) identified the reservation as a “blocked area” for anadromous fish in 1995 due to numerous dams and diversion structures which had been constructed across the Columbia, Snake

(continued)

**Box 15.1** (continued)

and Owyhee Rivers. Currently, the tribes believe that potential capacity exists today for their spawning and rearing success in the river. It is critically important to restore salmon and steelhead for the tribes' fishery resources and culture. The tribes assessed habitat conditions of the East Fork Owyhee River in 2013 through field surveys and confirmed the existence of significant carrying capacity. The tribes believe as a first step towards restoring salmon to the reservation, that it would be beneficial to develop a trap-and-haul program to transport adult salmon to the reservation from dams on the Lower Snake River. This would provide an initial test of habitat capability and also provide a tribal fishery that was lost over 80 years ago. Three reservoirs have been constructed and managed as a put-and-take trout fishery on the reservation as mitigation for federal dams: Mountain View Reservoir (~633 acres, 256 ha) located in Idaho, Sheep Creek Reservoir (~788 acres) and Lake Billy Shaw (~430 acres) located in Nevada. The "Duck Valley Reservoir Fish Stocking and Operation & Maintenance" program, funded by the Bonneville Power Administration has been managed by the Fish, Wildlife, & Parks Department and is an important program for the SPT as it partially mitigates for the loss of anadromous fishes on the reservation. The program provides tribal subsistence fishery, and generates precious economic revenue from fishing/camping permits to the general public (Fig. 15.5).



**Fig. 15.5** Location of the Duck Valley Indian Reservation (left) and photos (right) showing its use as a fishery

### 15.5.3 *Beyond Liaison and Consultation: Enduring Partnerships and Communities of Learning*

We need an environment which encourages iwi to participate; and I'm not just talking about with post-settlement tribes, or sticking rigidly to a narrow interpretation of the statute. We want to see a far more open relationship from regional councils and local authorities, to actively working with iwi in water management. The aspiration of co-management will only come about if iwi have built the capacity to fully participate in these processes. This may require further investment in education to spread understanding. Not everyone has the awareness and specialist knowledge that can help to shape our management of our natural resources. We need to build capability. (Pita Sharples, December 2009)

A commitment to the establishment and management of relationships is paramount to the facilitation of successful collaborations between Māori, researchers and government agencies (e.g. Allen et al. 2009; Lowe et al. 2009). Partners who commit to relationships that are established with the view to extend beyond the life of a particular contract are more likely to be asked back to help access ongoing opportunities to build on projects and interests within the community. In time these collaborative partnerships will foster the networks of people and communities of learning (Robson et al. 2009) that are required to realise the long term goals and objectives of large lake restoration programmes. This is an unavoidably time intensive process requiring critical input by knowledge- and cultural-bridgers. Mutual needs (shared questions) and mutual benefits are potent drivers for collaboration and knowledge co-production (for example, see Case Study 15.5). The identification of questions and goals of common interest is an important precondition for the establishment of a dialogue between different knowledge-holders (e.g. Wilcox et al. 2008; Lowe et al. 2009; Gyopari 2015).

This can be challenging to achieve in reality when the expectations (some of which are time bound) of the various parties involved are different (funders, partners, project team members, interested parties, etc.). For example, Satterfield et al. (2005) express that:

Western business is driven by deadlines and the need to progress and make decision by certain times. Whereas Māori thought is not driven by any sort of time deadlines which can be very frustrating and sometimes unrealistic, but their focus is entirely on the process—doing it right.

Approaches that are grounded in tikanga Māori, Māori values and perspectives, and are co-designed to be responsive to their needs and aspirations, will ensure that the outcomes will be useful and of benefit to the participating indigenous community. The resulting outcomes are also more likely to strengthen and add value to existing community initiatives, thus increasing efficiencies when capacity and capability across different expertise is in demand (see Case Study 15.6).

It also requires a reassessment of who the knowledge holders are and a commitment (by agencies and funders) to move beyond the conventional understandings of who is “qualified” to engage in research and restoration initiatives. While whānau, hapū, rūnanga and iwi undoubtedly benefit from having their members qualify by

being active participants in research programmes and restoration efforts, in this chapter we have emphasised the need for a more holistic approach that recognises and empowers whānau to engage as co-governors, co-leaders, researchers, as knowledge holders and as teachers. A truly collaborative programme will provide for multiple roles. Lake restoration programmes should also include a strong focus on the intergenerational capacity and training needs of Māori. The Lake Waahi Restoration project (see Case Study 15.5) is a good example of where this approach was adopted. All of the physical restoration works (fencing, clearing, planting, pest control, etc.) was undertaken by local marae members who were specifically trained for the tasks. The collective buy-in to the project was so much greater as the marae whānau already have an inherent obligation as kaitiaki to look after the lake. The project provided an opportunity for “kaitiakitanga in practice” and opportunities for whānau and rangatahi (youth) to gain qualifications while undertaking restoration activities were actively facilitated.

## **15.6 National Policy Statement for Freshwater Management: Potential Challenges for Lake Restoration Programmes**

New collaborative approaches are being used to engage Māori under the National Policy Statement for Freshwater Management (NPS-FM) (MfE 2014) and new Resource Management Act 2014 reforms. The NPS-FM seeks to safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water; and the health of people and communities, at least as affected by secondary contact with fresh water. Sustainable management of the use and development of land, and of discharges of contaminants to maintain or improve freshwater quality are some of the ways being sought to achieve the objectives of the NPS-FM. The NPS-FM requires that councils set objectives for freshwater bodies that reflect a range of aspirations and values, and that limits for flow, water quantity and water quality are in turn set to ensure that the objectives are achieved (limit setting). These processes are currently grappling with the challenge of how Māori principles, values, aspirations and objectives are reflected in freshwater management approaches in Aotearoa-New Zealand.

As regional councils undertake their limit setting processes in response to the NPS-FM, lake restoration initiatives will be captured within these processes. What needs to be agreed between Māori and agencies is what is to be factored into the NPS-FM process and how. For example, in 2015 Environment Canterbury completed the limit setting process for the Selwyn-Te Waihora catchment via a plan change (McCallum-Clark et al. 2014). This limit setting process was impacted by Whakaora Te Waihora, an extensive cultural and ecological restoration programme between Ngāi Tahu and Environment Canterbury for Te Waihora, the largest lake in Canterbury and an important link in the chain of coastal lagoons and estuaries along

the east coast of the South Island. Ngāi Tahu and Environment Canterbury have a shared commitment to the restoration and rejuvenation of the mauri and ecosystem health of Te Waihora so that it continues to provide current and future generations with the sustenance, identity and enjoyment that it has in the past. Case Study 15.7 suggests that the planning framework for one lake was developed based on the future state which in turn was dependent upon a number of independent (and potentially unfunded) variables occurring. Unless there is a robust monitoring programme and a commitment to regular reviews of the modelling that underpins limit setting processes, developing frameworks based on the potential future state represents a risk, especially where the funding needed to realise the future state has not been secured. As these processes are rolled out throughout Aotearoa-New Zealand whānau, hapū, rūnanga and iwi will need to be cognisant of how agencies accommodate lake restoration programmes within limit setting processes. While restoration has to be a consideration when setting limits, it needs to be clear to Māori whether regional councils are developing statutory planning frameworks based on:

1. the current state and the restoration that has been completed; or
2. the potential state after restoration for which funding is guaranteed is completed;  
or
3. the potential state after longer-term restoration actions are completed (whether or not funding is secured).

Challenges are also encountered by mana whenua when fit for purpose methodologies are not being used to inform measures that are suitable for assessing the state of their values. For example, some regional councils are using the trophic level index (TLI) (Burns et al. 2000) in their limit setting processes. In the limit setting processes for Te Waihora and for the Waitaki River catchment, mana whenua had to understand and assess the impacts of different contaminant loads on the TLI and in turn assess the effects on their mahinga kai values. The TLI has been used in the limit setting for both Waitaki and Te Waihora but in two different contexts. In the case of Te Waihora, a scenario was based upon delivery of a specific TLI. The impacts of this TLI-led scenario were then assessed against a number of outcomes. The second example, the case of the Waitaki, was to set a specific TLI as an outcome. The different scenarios were evaluated based on their ability to deliver this outcome. In circumstances like these it is a challenge for some whānau to understand the impact of marginal differences, for example, a change from 2.6–2.8 to 3.0, on their rights and interests, especially their mahinga kai. The components of the TLI (e.g. total nitrogen, total phosphorus, water clarity and chlorophyll-*a*) are not well linked or communicated in the terms of mahinga kai interests and aspirations. Developing alternative and complementary assessment tools that are meaningful to Māori and enable mātauranga Māori to inform freshwater management, building on approaches such as the tau kōura (Kusabs and Quinn 2009; Kusabs et al. 2015a) and Cultural Health Index (Tipa and Tierney 2003, 2006), are fundamental if whānau, hapū and iwi are to meaningfully engage in limit setting processes.

## 15.7 Conclusions and Future Prospects

Whether post- or pre-settlement, mana whenua have continually lobbied for protection of Aotearoa-New Zealand's lakes and surrounding environments, and are committed to seeking a reversal in the state of degradation. Collaboration with Māori is essential for the success of lake research and restoration projects in Aotearoa-New Zealand and Māori partners are entitled to participate in formulating the strategy, undertaking the research, and working towards achieving outcomes. Engagement with whānau, marae, hapū, rūnanga and iwi at multiple levels should conform to Māori ethical guidelines recognising the principles, tikanga, and the rights, roles and responsibilities of Māori. Collaboration will build consensus, foster communities of learning, aid decision-making and will contribute to social and environmental change by fostering long-term commitment and understanding of all the parties involved.

### **Case Study 15.1 Understanding and Acknowledging Whakapapa—The Interrelationships Between People and a Tribal Taonga**

The story of Te Waihora (also now known as Lake Ellesmere) begins with the arrival of Waitaha. Ngāi Tahu oral traditions tell of Rākaihautū, who beached his waka at Whakatū (Nelson) and divided the new arrivals in two, with his son Te Rakihouia taking one party to explore the east coastline and Rākaihautū taking another southward by an inland route over the Southern Alps/Kā Tiritiri o te Moana. Te Rakihouia discovered the coastal lake (now known as Te Waihora) on his coastal journey south claiming the abundant resources of the area for his father. Hence the lake being named Te Kete Ika a Rākaihautū—the fish basket of Rākaihautū. Generations later, when Ngāti Mamoe arrived from Te Ika a Maui (the North Island) settling among the Waitaha, a prominent man of this tribe, Tutekawa, established his home at Waikākahi (Birdlings Flat), and pronounced Te Waihora as his own hence the lake's second name, Te Kete Ika a Tutekawa—the fish basket of Tutekawa. When Ngāi Tahu came south they proclaimed Orariki, Taumutu, their home and thus the resources of the lake as their own.

These historic travels symbolise and continue to reinforce tribal identity, solidarity and continuity between generations, providing the context underpinning Te Waihora as a tribal taonga. For Ngāi Tahu, Te Waihora has always been a highly valued food source. Historically, the lake and surrounding areas were renowned for its abundance of fish, waterfowl, plants (including medicinal plants), and special muds used for dyeing (Palmer and Goodall 1989; Tau et al. 1990; James 1991; Waitangi Tribunal 1991; Anderson 1998).

### Case Study 15.2 Cultural Redress Mechanisms in the Te Arawa Lakes Settlement Act 2006

The Te Arawa Lakes Settlement Act 2006 is the settlement of historical claims relating to Te Arawa lakes, returning ownership of 13 lakebeds to Te Arawa Lakes Trust on behalf of Te Arawa hapū and iwi. The lakes include Rotoehu, Rotomā, Rotoiti/Te Roto kite a Ihenga Ariki ai a Kahumatamomoe, Rotorua/Te Rotorua nui a Kahumatamomoe, Ōkataina/Te Moana i kataina a te Rangitakaroro, Ōkāreka, Rerewhakaaitu, Tarawera, Rotomāhana, Tikitapu, Ngāhewa, Tutaeinanga, Ngāpourī/Opouri and Ōkaro/Ngakarō. The Deed establishes protocols to enhance good working relationships between Te Arawa and agencies such as Department of Conservation, the Ministry of Primary Industries, the Ministry for Culture and Heritage, and the Ministry for the Environment, on cultural matters of importance to Te Arawa.

The Settlement also establishes in law, the enduring joint management collaboration—the Rotorua Te Arawa Lakes Strategy Group—which is made up of representatives from Te Arawa Lakes Trust, Bay of Plenty Regional Council and Rotorua District Council. The purpose of this collaboration is to coordinate policy and actions to:

Contribute to promoting the sustainable management of the Te Arawa lakes and their catchments for the use and enjoyment of present and future generations, while recognising and providing for the traditional relationship of Te Arawa with their ancestral lakes.

As part of the Act, the Crown has made regulations that empower the Trustees of the Te Arawa Lakes Trust to manage the customary and recreational harvest of selected fisheries. The Te Arawa Lakes (Fisheries) Regulations (2006) cover non-commercial customary fishing within the Te Arawa fisheries area and do not provide for commercial fishing. The Act provides for the establishment of Komiti Whakahaere (a fisheries management committee established under the regulations) to manage the customary fisheries in accordance with Te Arawa tikanga and kawa. The Mahire Whakahaere or the Te Arawa Lakes Fisheries Plan is required under the regulations to provide for the sustainable management of customary fisheries. The customary fisheries include kōaro (*Galaxias brevipinnis*), tuna (both shortfin *Anguilla australis* and longfin eel *A. dieffenbachii*), common smelt (known locally as “īnanga”, *Retropinna retropinna*) and toitoi or common bully (*Gobiomorphus cotidianus*). The kōura (*Paranephrops planifrons*) and the freshwater mussel, known locally as kākahi (*Echyridella menziesi*) are also important customary species for Te Arawa.

### **Case Study 15.3 Use of the Tau Kōura in Te Arawa Lakes to Provide Quantitative Information for Use in Customary Fisheries Management**

Kōura are a valued kai species and considered a delicacy by Te Arawa. In the past they were a staple food item, and prized for their use as a bartering item (Kusabs and Quinn 2009). Although found in many other freshwater streams and waterways, the Te Arawa lakes and Taupō-nui-a-Tia were considered among the most productive kōura fisheries in New Zealand (Mair 1923; Hiroa 1921; Best 1929). An example of this productivity was at the opening of Tamatekapua Marae at Ohinemutu in 1873, where a reputed 500 rohe (where a rohe was roughly the equivalent of a modern sack) of dried kōura and īnanga were consumed (Hiroa 1921).

A variety of methods are still used to capture kōura in the Te Arawa lakes, including the tau kōura (bundles of packed bracken tied to a rope and placed along the lake bed), the paepae or hao (a dredge net), collecting kōura by hand, rama kōura (night-time spotlighting using small dip nets) and hi kōura. The tau kōura was the favourite traditional fishing method for harvesting kōura in Te Arawa lakes (Hiroa 1921). This method involves the placement of bracken fern bundles (known as whakaweku) on the lake bed for kōura to take refuge in and then retrieving the bundles into a canoe to harvest the kōura. Tumu made out of rewarewa and ponga ferns (*Cyathea dealbata*) marked the fishing grounds and helped to delineate the boundaries of the various hapū and whānau (Hiroa 1921).

Until recently, there was a lack of quantitative information on kōura abundance and ecology which made it difficult for Te Arawa Lakes Trust to manage kōura populations in the Te Arawa lakes. The recent adaption and use of the tau kōura for monitoring (Kusabs 2006; Kusabs and Quinn 2009; Kusabs and Butterworth 2013) and research purposes (Kusabs and Butterworth 2011; Kusabs et al. 2015b) has significantly increased our understanding of kōura populations in the Te Arawa lakes. For example, Kusabs et al. (2015b) found that kōura abundance and distribution in seven Te Arawa lakes was influenced by the combined effects of lake-bed sediments, lake morphology, and hypolimnetic conditions related to trophic state. Sediment particle size was identified as the strongest driver of kōura abundance and biomass, with kōura populations increasing with increasing sediment particle size. Kōura abundance was highest in lakes Rotomā, Rotorua and Rotoiti which had a high proportion of coarse lake bed substrates and low in lakes Ōkāreka, Rotokākahi, Tarawera and Ōkaro where lake bed substrates were composed mainly of mud.

A number of customary management changes arising from the information gathered using the tau kōura are suggested in Kusabs et al. (2015a) to protect and enhance the kōura fishery. Tau kōura have now also been successfully deployed in rivers and streams in the Waikato River catchment and there are also aspirations to utilise adaptations of the tau kōura method to help reintroduce and rehabilitate kōura populations in other lakes around Aotearoa-New Zealand.

### Case Study 15.4 Ma Uta Ki Tai Catchment-Wide Approaches to the Restoration of Lake Ōmāpere

Lake Ōmāpere (1197 ha, maximum depth about 2.6 m) is the largest lake in Northland. This lake is of huge significance to Ngāpuhi who regard it as a “food basket” that historically supplied tuna (eel), torewai (freshwater mussels), raupō (bulrush, *Typha orientalis*), kāpūngāwhā (clubrush, *Schoenoplectus tabernaemontani*) and harakeke (flax, *Phormium tenax*) (White 1998). Thousands of katua (migrating tuna) and tautoke (lake resident tuna) were caught each season (White 1998). The lake was an early source of timber and flax fibre, which was exported via the waterways, and also a site for kauri gum digging (White 1998). Ngāpuhi sought to formalise ownership of the lake prior to 1929, but it was not until 1955 that the Māori Land Court vested the lake in the Lake Ōmāpere Trustees on behalf of all Ngāpuhi (i.e. the lake bed, water and resources in the water are owned by Māori) (White 1998). Ngāpuhi have always regarded Lake Ōmāpere as a significant source of food which should be respected. The lake continues to be acknowledged as a highly significant taonga and mahinga kai site for the marae, hapū and iwi which surround it (Lake Ōmāpere Project Management Group 2006). With the main outflow of the lake being the Utakura River which flows out to the Hokianga harbour, the lake catchment also supports many hapū communities who reside downstream along the river and within the Hokianga harbour.

The declining water quality of Lake Ōmāpere has long been of concern for the community. Mana whenua have continually lobbied for protection of Lake Ōmāpere and environs, and are determined to reverse the state of degradation. Activities such as deforestation, establishment of pasture, drainage of wetland areas, lowering of lake water levels and intensification of pastoral farming have all contributed to a steady decline in lake water quality, and in turn, the water quality of the only outlet, the Utakura River. In 1984 dense growths of the invasive weed *Egeria densa* were first documented (Tanner et al. 1986). In 1985 the Northland Area Health Board prohibited water takes from the lake for domestic supply after Kaikohe residents complained of stomach upsets and the lake source was found to have a severe cyanobacterial bloom (Northland Regional Council 2001). Downstream, in upper reaches of the Hokianga Harbour, fish and shellfish became unsafe to eat (Grey 2012). It was apparent that the *Egeria* weed beds had collapsed, leaving Lake Ōmāpere in a turbid,

(continued)

**Case Study 15.4** (continued)

de-vegetated algal-dominated state for years (Champion and Burns 2001). Grass carp were introduced between in 2000 and 2002 which has contributed to the interruption of the boom–bust cycle of *Egeria* invasion alternating with an algal-dominated state (Henwood and McCreanor 2013).

In 2004, the Lake Ōmāpere Project Management Group (LOPMG) bought together mana whenua, stakeholders, and agencies with responsibilities in the area to identify a restoration and management strategy for the lake. This strategy, based on ma uta ki tai (catchment-wide) approaches to restoration, emphasises interconnectedness and inclusion, both spatially and socially (LOPMG 2006) and aims to improve the health of Lake Ōmāpere by strengthening kaitiakitanga. It outlines a series of practical actions and outcomes which are required to achieve the overarching vision of waiora, where waiora describes the life giving element of the lake which can only be fully realised when it is restored to a healthy condition where the people and the wider environment can benefit. Four central elements are identified as important to achieving waiora:

- *Ma uta ki tai*: Emphasising the total connectedness of the natural environment and acknowledging that Lake Ōmāpere will not be restored through isolated initiatives or a narrow focus.
- *Mātauranga*: Has been viewed broadly as knowledge or teachings which underpin kaitiakitanga. There is an urgent need to focus on knowledge regarding Lake Ōmāpere and its context environmentally, historically and spiritually to enhance the cultural indicators that are appropriate for long term monitoring of the health of the lake and its environment.
- *Rangatiratanga*: Conveys the sense of authority, control and responsibility inherent in the exercising of kaitiakitanga. There is a need to ensure appropriate structures and practices are in place to support the long term restoration of Lake Ōmāpere.
- *Kotahitanga*: Refers to a unity of purpose in relation to Lake Ōmāpere and the importance of the development and maintenance of relationships to support such a purpose.

**Case Study 15.5 Capacity Building for Mana whenua Embedded in Lake Restoration Objectives**

Lake Waahi is located near the township of Huntly, on the western bank of the Waikato River. The area around Huntly is referred to as Raahui Pookeka and is steeped in Waikato-Tainui history. There are a number of marae in and around Huntly including Waahi Paa (which is a principal paa of Ngaati Mahuta and is

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### Case Study 15.5 (continued)

the family residence of the Kaahui Ariki, the paramount family of the Kiingitanga, led by Kiingi Tuheitia), Kaitumutumu Marae, Te Kauri Marae, Te Ohaaki Marae, Hukanui Amuri Paa, Taupiri Marae and Matahuru Marae. The majority of these marae are located within a 2-km radius of Lake Waahi and the Waikato River. Lake Waahi is very significant to mana whenua. The Waahi Stream which connects the lake to the Waikato River has been fished for migrant eels (puhi) for generations. Lake outlets were strategically chosen to build rauwiri/paa tuna (weirs) and capture puhi, as they were much easier to block off. During special marae occasions it is an expectation by those who attended that puhi will be served at meal times. This expectation has built up over generations of tradition and experience during which time the people of Raahui Pookeka have fished the annual migration.

Lake Waahi has poor water clarity due to high concentrations of algae (resulting from high nutrient loads) and high sediment inflows which smother the lake bed and the submerged native plants. This is exacerbated by the presence of koi carp, which enter the lake via Waahi Stream and have led to the decline and collapse of submerged plant communities. The poor water quality has degraded ecological values and the mauri of the lake.

In conjunction with mana whenua and Waikato River stakeholders, in 2011 Genesis Energy commissioned a survey that showed a range of pest fish are present in the lake, including koi carp, goldfish, perch, tench and catfish. This is of concern to tāngata whenua as koi carp are now estimated to make up 80% of the total biomass in the lower Waikato River catchment where they compete with native fish for habitat and destroy submerged plant communities. Encouragingly, the survey also identified a range of native fish species in the lake, including shortfin and longfin eels, mullet, smelt and iinanga. Giant kookopu, banded kookopu and rare mudfish are known to be present within the lake catchment, particularly the tributary streams. These results demonstrate that the lake has good connectivity to the Waikato River via Waahi Stream, despite the presence of flood control gates near its confluence with the Waikato River. It also demonstrates that restorative actions which increase habitat potential and water quality in the lake will be successfully utilised by existing native fish species present. The 2011 survey built on decades of research on Lake Waahi, and the issues impacting the lake are now very well defined, as are the priority restoration actions.

In 2012, Waahi Whaanui Trust, Waikato Raupatu River Trust and Genesis Energy secured WRA funding to complete restoration works around Lake Waahi. The high-level objectives of the Lake Waahi project included the following: (a) A multifaceted and holistic work programme to improve the health and well-being of Lake Waahi through improved riparian and wetland habitat, and pest fish control; (b) To allow Waikato-Tainui, Waahi Whaanui

(continued)

**Case Study 15.5** (continued)

Trust, and the people of its marae and hapuu, to build capacity in native plant nursery establishment and operation, riparian/wetland enhancement and protection, and ecological and kaitiaki monitoring, through the integration of maatauranga and ecological values and (c) To monitor the habitat enhancement works so that improvements can be quantified, from both Western scientific and kaitiaki perspectives. The project aimed to act as a catalyst for a Waikato-wide approach for enhancing the overall environmental quality of shallow Waikato lakes, and building capacity for taangata whenua.

**Case Study 15.6 Mana whenua Driving Collaborative Relationships and Networks**

Mana whenua have been the drivers of the collaborative relationships and networks required in the Lake Ōmāpere and Utakura River catchment to extensively fence and plant the riparian lake edges, conduct new research to inform restoration actions, and have adapted culturally specific assessment and monitoring tools (Henwood and Henwood 2011) which will compliment continuing water quality monitoring in assessing the direction and magnitude of response to restoration initiatives. Planting the riparian strip has not only helped absorb nutrient runoff that has played a major part in the degradation and eutrophication of the lake, but also the restoration of native plants is creating a habitat for native birds and beautifying the area.

The partnership between Te Roopu Taiao o Utakura, Ngāpuhi Fisheries Limited and NIWA began in 2008 with a lake fishery assessment that was required by mana whenua to provide a reference point for future tuna monitoring and research. As a result of this study the Lake Ōmāpere Trust placed a rāhui on the commercial harvest of lake tuna populations. Te Roopū Taiao o Utakura then commissioned a nutrient budget for Lake Ōmāpere (Verburg et al. 2012) which showed during the algal-dominated phase a nutrient legacy in the sediments fueled internal regeneration that greatly exceeded loads from the catchment, with eventual export from the lake via the Utakura River and denitrification. In contrast, during the weed bed-dominated state nutrients accumulated in the sediments (Verburg et al. 2012).

Underpinned by the four principles of ma uta ki tai, mātauranga, rangatiratanga and kotahitanga, some of the key factors underpinning the relatively rapid success of mana whenua in progressing lake rehabilitation are: strong leadership, focus on developing intergenerational capacity and capability (of themselves and other Māori and non-Māori practitioners), formation of long term collaborative relationships across multiple organisations,

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### **Case Study 15.6 (continued)**

and development of a publication track record that assists this roopu to secure funding to develop and deliver their own research initiatives.

Henwood and Henwood (2011) report social spill-over benefits for people involved in restoration of Lake Ōmāpere:

Other positive project outcomes to date relate to relationships, collaborations, capacity and capability. Those involved in the lake project are now part of a large network of people with expertise and an interest in environmental restoration.

Henwood and Henwood (2011) also highlight the cultural benefit of involving Te Roopū Taiao o Utakura with scientific water quality monitoring:

Recording and dissemination of local environmental information is expected to increase understanding of the role of kaitiakitanga as a social practice, and its relationship to waiora and hauora in sustainable environmental restoration.

### **Case Study 15.7 Limiting Setting and Lake Restoration**

In the Officers Section 42 Report to the panel hearing the Selwyn-Waihora plan change, a considerable portion of the evidence focused on what was planned in the future under the next stage of Whakaora Te Waihora. What is still missing is any commitment to fund Stage 2. In other words, the solutions package that set limits are relying on the interventions of Stage 2 which, depending on funding, may or may not be implemented.

The officer's report to Plan Change 1 stated that:

Funding will come from public, private and community sources.

The proposed work programme for Stage 2 involves:

- Maintaining the current initiatives and supporting new initiatives to restore habitat and achieve biodiversity enhancement from the initial focus catchments into 40 key catchments including significant drains and waipuna (spring heads), primarily through 800 km of riparian planting, predator pest and weed control and instream remediation and enhancement.
- Continuing to improve current land practices through extended farm management planning, catchment strategies and broadening support for landowners and catchment communities to implement on-farm improvement measures across the whole lake catchment.
- Enhancing lake resilience to absorb legacy impacts by creating significant buffer areas through mid-catchment wetland re-establishment; lake margin

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**Case Study 15.7** (continued)

protection; and retirement and enhancement of inlets and embayments for fish refugia, macrophyte establishment and mahinga kai.

- Implementing lake interventions investigated in Phase 1 for lake level control, nutrient processing and in-lake habitat creation—e.g. phytoplankton and nutrient interaction and salinity tolerance—by moving into the next stages of the design and development of lake opening and closing infrastructure, enhanced channelling, floating wetlands, macrophyte beds and in-lake islands.
- Implementing sediment traps, sand wand, and creation of riffle and refugia in streams.

## Glossary of Te Reo Māori Used in this Chapter

**Haka** Ceremonial dance

**Hapū** Is a tribal grouping that consists of whānau who typically share descent from a common ancestor

**Harakeke** Flax, *Phormium tenax*

**Hauora** Healthy

**Hikoī** Walk, field trip

**Hui** Assembly, meeting, gathering

**Īnanga** Typically refers to *Galaxias maculatus* with the exception of the Te Arawa Lakes where common smelt (*Retropinna retropinna*) is known locally as īnanga

**Iwi** Is an extended tribal grouping that consists of hapū or whānau who typically share descent from a common ancestor and associate with a distinct territory

**Kaahui Ariki** The paramount family of the Kīngitanga

**Kai** Food

**Kāinga** Home, village

**Kaitiaki** Guardian

**Kaitiakitanga** The exercise of customary custodianship, in a manner that incorporates spiritual matters, by those who hold mana whenua status for a particular area or resource. Kaitiakitanga is inextricably linked with concepts such as tino rangatiratanga (without which the practical implementation of kaitiakitanga is constrained or impossible) and taonga (Satterfield et al. 2005)

**Kākahi** Freshwater mussels (typically *Echyridella menziesi*)

**Kanohi-ki-te-kanohi** Face to face

**Kāpūngāwhā** Clubrush, *Schoenoplectus tabernaemontani*

**Kaupapa** Theme, philosophy, topic

**Kawa** Ceremonial protocols, rituals

**Ki uta ki tai** From the mountains to the sea

**Kiingi** King

**Kiingitanga** The King movement—a movement which developed in the 1850s, established top stop the loss of land and promote Māori authority, to maintain law and order, and to promote traditional values and culture

**Kōaro** *Galaxias brevipinnis*

**Komiti Whakahaere** Is the fisheries management committee established under the Te Arawa Lakes (Fisheries) Regulations (2006) to manage the customary fisheries in accordance with Te Arawa tikanga and kawa

**Kōura** Freshwater crayfish (used in this chapter to refer to the North Island species, *Paranephrops planifrons*)

**Mahire Whakahaere** Is the Te Arawa Lakes Fisheries Plan required under the Te Arawa Lakes (Fisheries) Regulations (2006)

**Mahi** Work, to make, undertaking

**Mahinga Kai** 1. Is referred to in the National Policy Statement for Freshwater Management 2014 as indigenous freshwater species that have traditionally been used as food, tools, or other resources 2. To Ngāi Tahu mahinga kai is used to refer to their interests in traditional food and other natural resources and the places where those resources are obtained, i.e. food-gathering place

**Mana** Prestige, authority, status

**Mana whenua** Refers to the mana held by local people who have “demonstrated authority” over land or territory in a particular area, authority which is derived through whakapapa links to that area

**Manaakitanga** The process of showing respect, generosity and care for others

**Manuhiri** Guest, visitor

**Māori** Indigenous people of Aotearoa-New Zealand

**Marae** Is a place typically in front of a wharehau (meeting house) where the members of whānau, hapū, or iwi meet and engage in pōwhiri (the ceremony of greeting and encounter), and includes associated buildings, such as the wharehau (meeting house) and wharekai (dining room), and surrounding land

**Mātauranga Māori** Is a holistic perspective encompassing all aspects of knowledge and seeks to understand the relationships between all component parts and their interconnections to gain an understanding of the whole system. It is based on its own principles, frameworks, classification systems, explanations and terminology. Mātauranga Māori is a dynamic and evolving knowledge system and has both qualitative and quantitative aspects

**Mauri** Essential life force or principle, a quality inherent in all things both animate and inanimate

**Murihiku** A region of the South Island in Aotearoa-New Zealand. Traditionally it was used to describe the portion of the South Island below the Waitaki River, but now is mostly used to describe the province of Southland

**Noa** Free from tapu

**Nohoanga** 1. Dwelling place, abode, encampment 2. Are temporary campsites for Ngāi Tahu whānau to use

**Ora** Alive, well

**Pā** Traditional settlement

- Pā tuna** Eel weirs
- Pākehā** European New Zealanders
- Papatipu marae** Original Māori land, a meeting place for tāngata whenua, and a focal point for rūnanga
- Papatūānuku** Mother Earth
- Puhi** Migrant eel (Lake Waahi)
- Rāhui** A kind of prohibition. Rāhui were imposed variously to ensure the sustainability of a resource, after waters had been polluted (usually as a consequence of a death) or to reserve a resource for one's use (White 1998)
- Rangatahi** Youth
- Rangatira** Chief, leader
- Rangatiratanga** Self-determination, chieftainship, decision making rights
- Raupō** Bulrush, *Typha orientalis*
- Rohe** Tribal area, district, region
- Roopu** Group
- Rūnanga/Rūnaka** Tribal assembly, council
- Taiao** Environment
- Takiwā** Area, district, region
- Tangata tiaki** Individuals involved in the guardianship of a resource/area
- Tāngata whenua** People of the land
- Taniwha** In Māori mythology, taniwha are beings that live in rivers, caves, or in the sea. They may be considered highly respected kaitiaki (protective guardians) of people and places
- Taonga** Significant treasure, possessions, something prized
- Tapu** Restriction. Tapu was used as a way to control how people behaved towards each other and the environment
- Tau kōura** A Te Arawa-Tūwharetoa traditional method of harvesting kōura
- Te Ao Māori** Māori world view
- Te Reo Māori** The Māori language
- Te Ture Whaimana o te Awa o Waikato** The Vision and Strategy for the Waikato River
- Tiaki** To protect, guard and look after
- Tino Rangatiratanga** As absolute power and authority refers to the person or group who has the power to act with ultimate authority when necessary (Satterfield et al. 2005)
- Tikanga Māori** Correct procedure, custom, lore, method and practice
- Te Tiriti o Waitangi** The Treaty of Waitangi. An agreement made between the British Crown and about 540 Māori chiefs first signed on 6 February, 1840
- Tohu** Sign, mark, symptom
- Tohunga** Expert, specialist
- Torewai** Freshwater mussel
- Tumu** Surface-reaching pole (tau kōura) used to mark fishing grounds and delineate boundaries between hapū (Hiroa 1921)
- Tuna** Freshwater eels

**Tūpuna** Ancestors

**Wāhi tapu** Sacred area/place

**Waiora** Health

**Waipuna** Spring heads

**Waka** Canoe

**Wairua** Spirit

**Wānanga** Learning

**Whakapapa** Connection, lineage, genealogy between humans and ecosystems and all flora and fauna. Māori seek to understand the total environment or whole system and its connections through whakapapa, not just part of these systems, and their perspective is holistic and integrated (Harmsworth and Awatere 2013)

**Whakataukī** Proverb

**Whakaweku** Bracken fern bundles (as a component of the tau kōura)

**Whānau** A family group that consists of individuals who typically share a common whakapapa and identify with a common living or recent ancestor

**Whanaungatanga** Whanaungatanga refers to the reciprocal support relationship between members of the same whānau, hapū and iwi

**Whenua** Land

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