Restoring the Mauri of Coastal Dune Lake Ecosystems:

The case study of Lake Waiorongomai, Ōtaki

Aotearoa / New Zealand

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Abstract

This doctoral thesis documents and analyses a six-year, hapū-led, iwi-and community-supported, kaupapa-Māori-based (Māori-cultural-values-based) project that resulted in the transformative change of a dune lake ecosystem (which included people i.e., a whānau Māori ecosystem).

Lake Waiorongomai, just north of Ōtaki, is a culturally-significant ancestral landscape and wāhi tapu (sacred site) for local whānau (extended families), hapū (sub-tribes) and iwi (tribes). The mana (prestige), mauri (life force) and ecological wellbeing of this wāhi tapu was diminished as a result of forest clearance, hydrological modification of the lake catchment, and the effects of pastoral farming activities. Attempts over the last three decades to bring Māori land owners and hapū members together to re-instate the mana and mauri of the dune lake ecosystem met with limited success. This thesis documents and seeks to better understand: (i) the conditions that gave rise to a successful restoration project; and (ii) the factors that empowered this hapū-led project.

The study shows that conditions that contributed to a successful project involved: (i) collective land owner, local hapū and iwi support; (ii) a kaupapa Māori approach; (iii) project activities guided by the expression of rangatiratanga (sovereignty) and the contributions of a kaitiaki team who were appointed by hapū members; and (iv) the engagement of a kaupapa Māori researcher to support the hapū initiative and their revitalisation aspirations.

Transformative change in this case study was change that had positive effects on physical, cultural, social, psychological and spiritual wellbeing. In the Lake Waiorongomai restoration project, the outcomes that had positive effects for the whānau

Māori ecosystem include, but are not limited to: (i) fencing the lake with a 50m riparian margin; (ii) fencing the Waiorongomai Stream with a 10m riparian margin; (iii) community involvement in planting more than 3000 native plants, translocating over 1000 harakeke (swamp flax), and trapping over 100 pests (including stoats and ferrets); and (iv) reconnection of whānau and hapū members to the lake, through regular wānanga and ongoing restoration activities such as winter planting days. The habitat within the lake and surrounding wetlands provided opportunities to observe amongst other things threatened species such as the tiny button daisy, raoriki (swamp buttercup), fennel-leaved pond weed, matuku (bittern), kotuku ngutupapa (royal spoonbill), kotuku (white heron), parera (grey ducks), weweia (dab chicks) and pūweto (spotless crake). The improvement in the wellbeing of two species, inanga (whitebait) and watercress, over the course of the study is of particular note, since these species hold customary value for whānau and hapū.

A central focus of this research is the relationship that ecological wellbeing and whānau, hapū, iwi wellbeing are inextricably linked. In summary, this hapū-led, community supported project took initial, confident steps in reclaiming, reframing and re-instating the mana and mauri of this whānau Māori ecosystem.

This thesis argues that transformative changes were generated by empowering factors that were closely linked with: (i) the creation of a project space that allowed the free expression of kaupapa and tikanga (customs) in a socially and culturally mediated journey; (ii) whānau and hapū members' expressions of kaupapa and tikanga that enhanced the success of this project; (iii) contributions of iwi members, councils and the wider community; (iv) the sharing and developing of mātauranga (knowledge) including through the involvement of learning institutes (e.g. whare wānanga, kura kaupapa, kōhanga reo and university students); and (v) a synthesis of Māori and

Western restoration and research methods (including ecological monitoring). These empowering factors assisted in affirming to local hapū members that their expressions of kaupapa and tikanga were crucial in generating initial lake ecosystem wellbeing improvements including the enhancement of mauri.

Two key lessons can be drawn from the role of these various factors in transformative change. First, no individual contribution was enough to ensure the success of the restoration. However, when a safe kaupapa and tikanga space was created for the inclusion of all contributors, the total effect was more than the sum of the individual parts (i.e., a synergistic outcome resulted). Second, the results indicate that it is highly unlikely that a Western methodological approach on its own would have been as successful in achieving a project outcome of this kind. A comparison of the key characteristics of kaupapa Māori and action research showed that a kaupapa Māori research methodology was the most appropriate for this case study. As such, this thesis may enhance current action research theory and method by showing how it could be responsive to cultural values, knowledge, customs and language in a real-world, wicked problem context of this kind.

In documenting and exploring the various conditions and factors that made this restoration project possible, this thesis provides environmental planners and policy makers a real-world window into how transformative and progressive community-ecosystem outcomes can be achieved in a Māori cultural context through the use of a kaupapa Māori approach.

Dedication

I dedicate this doctoral thesis to the whānau, hapū and iwi of

Lake Waiorongomai.

Ngā mihi

I would like to acknowledge all the many individuals and organisations that supported me, my doctoral research and the Lake Waiorongomai restoration project. Ko te mea tuatahi, he mihi atu ki ngā atua, ōku tūpuna, ngā kaitiaki hōki. You provided me with protection and guidance. Secondly, a special mention to my immediate whānau who I looked to for inspiration: children (Āwhina and Kiinui); my mum (Eila); and cousin/colleague Moira Poutama for all their love and support throughout this doctoral endeavour.

I appreciated the essential guidance and wisdom of the kaitiaki team (Te Waari Carkeek, Rupene Waaka, Caleb Royal, Rolly Raureti and Libby Hakaraia), supervisors (Professor Murray Patterson, Associate Professor Huhana Smith and Associate Professor Russell Death) and mentors (Tim Park, Rob Cross, Michael Urlich and Richard Anderson). A special thanks to whānau members Ariana Te Aomarere, Nellie Carkeek, Nick Albert and Anthony Cole who also provided vital guidance at times throughout this research journey.

A special mention to Ngā Hapū o Ōtaki, Lake Waiorongomai 10 Trust and Waiorongomai 1A Trust trustees for their endorsement and ongoing support. An acknowledgement of financial assistance that I received from the Tainui Doctoral Scholarships and Raukawa Education Grants, Work and Income Ōtaki office, as well as employment by Taiao Raukawa Environmental Research Unit. Thanks to dear friends Derrylea Hardy and Maraea Hunia for their assistance during this doctoral journey.

Abbreviations

DoC	Department of Conservation
GWRC	Greater Wellington Regional Council
KCDC	Kāpiti Coast District Council
LWRP	Lake Waiorongomai Restoration Project
MBIE	Ministry of Business, Innovation and Employment
MTM	Manaaki Taha Moana
NHoO	Ngā Hapū o Ōtaki
NLC OMB	Native Land Court Otaki Minute Book
Taiao Raukawa	Te Reo a Taiao Raukawa Environmental Research Unit
Te Rito	Te Kura Kaupapa Māori o Te Rito
Whakatupuranga Rua Mano	Te Kura-ā-Iwi o Whakatupuranga Rua Mano

Glossary

Atua	God/s, deities
Aotearoa	New Zealand
Harakeke	Flax plant (*Phormium tenax*)
Hapū	Sub-tribe, clan
Hīkoi	Walk
Hīnaki	Eel trap
Hui	Meeting, gather
Io	Supreme god/deity
Io Matua Kore	Io-the-parentless-one, one of the names for the supreme deity, Io
Iwi	Tribe, nation
Kaiako	Teacher
Kaimoana	Food of the sea
Kaitiaki	Guardian, caretaker
Kaitiakitanga	Guardianship, stewardship
Kanohi ki te kanohi	Face to face
Kapowai	Dragon fly
Karakia	Prayer/s
Kaumātua	Elder/s
Kaupapa	Values, strategy, purpose
Kaupapa tuku iho	Values passed down from our ancestors
Kawa	Protocol
Kawenata	Covenant
Kete	Bag, basket
Koha	Gift
Kōrero	Speak, narrative
Kotahitanga	Unity, togetherness, collective action
Koura	Freshwater crayfish

Kuia	Female elder
Kura	School
Kura kaupapa	Māori medium schools
Mahinga kai	Cultivation, food gather place
Mahi	Work, job, labour
Mana	Prestige, integrity, charisma
Mana whenua	Trusteeship of land
Manaakitanga	Hospitality, generosity
Marae	Meeting place, building of tribe/sub-tribe, village
Mātauranga	Knowledge, information, education
Māori	Ordinary, native people of New Zealand
Mauri	Life force
Mihi	Acknowledge, thank
Mihimihi	Introductory speech
Moana	Sea
Ngā Hapū o Ōtaki	The sub-tribes of Ōtaki
Ngahere	Forest
Pā	Village, occupation site
Papatūānuku	Earth mother
Papakāinga	Original home, home base
Pākehā	Non-Māori, European
Pūtaiao	Science
Pūkenga	Scholars
Pūkengatanga	Teaching, learning, educating
Rahui	No take, quarantine
Rangatira	Chief, leader/s, of high rank
Rangatiratanga	Sovereignty
Ranginui	Sky father
Rohe	Territory

Rohe moana	Coastal area
Tainui	Ancestral canoe of Waikato
Tamariki	Children
Tangata whenua	People of the land, indigenous people
Tapu	Sacred
Taonga	Treasure
Te Aro-nui	The realm perceived by human senses
Te Ao Māori	Māori worldview
Te Ao Marama	The natural world
Te Ao Tua-ātea	The spiritual realm of Io Matua Kore
Te kete aronui	The basket of life's knowledge
Te kete tuatea	The basket of ancestral knowledge
Te kete tuauri	The basket of sacred knowledge
Te reo Māori	The Māori language
Te whānau ā Ranginui rāua ko Papatūānuku	The extended family of sky father and earth mother
Tikanga	Custom, practice, protocol
Tino rangatiratanga	Absolute sovereignty
Tohunga	Priest, spiritual expert
Tohu	Sign
Tono	To request, bid
Tua-uri	The realm of mauri
Tuna	Eel
Tūpuna	Ancestor/s
Ūkaipōtanga	To return home/source
Wāhi tapu	Sacred site
Wairua	Spirit, soul
Wairuatanga	Spirituality
Waka	Canoe

Wananga Learning, workshop, seminar

Whakanoa Free from sacredness, to make ordinary

Whakapapa Genealogy

Whakatauki Proverb

Whakatupu mātauranga Knowledge development

Whānau Family, extended family

Whānaunga Relation

Whanaungatanga Kin ship, family relationships

Whare wānanga Place of higher learning, university

Whenua Ground, country, placenta

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Chapter 1 Introduction

Tahuanuku, tahuarangi, e te iwi e, homai te wairua ora, he ora.

Gifts of land, gifts from heaven, the people call for spiritual wellbeing, it lives.

This doctoral thesis documents the findings of a six-year research activity based on reflective inquiry into a hapū[1]-led dune lake and wetland[2] restoration activity that involved: (i) the coordination of knowledge development across kaupapa[3] Māori and western scientific worldviews; and (ii) the collective emergence of a hapū-mediated restoration approach that is (in this thesis) compared and contrasted with action research theory and practice. Both of these distinguishing characteristics are of central importance to cross-cultural planning practice in New Zealand and other countries. Given the central role of the expression of kaupapa tuku iho[4] and rangatiratanga[5] in this research activity, this doctoral thesis has been written in an academic style[6] that recognises the importance of Māori cultural values to Ngā Hapū o Ōtaki[7], who are the kaitiaki[8] of Lake Waiorongomai in conjunction with the Lake Waiorongomai 10 Trustees.[9] In the western scientific tradition of knowledge development, an investigative or research process typically starts with the identification of a research

[1] Sub-tribe, clan.
[2] Lake Waiorongomai.
[3] Values.
[4] Values passed down from our ancestors.
[5] Sovereignty.
[6] The academic writing style used in this doctoral thesis draws on the guidance of Ngā Hapū o Ōtaki and is consistent with emerging kaupapa Māori research methods as articulated by modern Māori scholars.
[7] Ngā hapū o Ōtaki (The sub-tribes of Ōtaki) was established to represent the five hapū of Ōtaki, Ngāti Korokī, Ngāti Maiotaki, Ngāti Huia ki Katihiku, Ngāti Pare and Ngāti Kapu.
[8] Guardian, caretaker.
[9] Trustees listed on Te Kooti Whenua Māori: Māori Land Online Website, www.maorilandonline.govt.nz

question.[10] In this project, the kaitiaki of Lake Waiorongomai preferred a statement of intent based on multiple goals rather than a singular research question because their reasons for initiating this activity were related to other priorities including: (i) growing collective concern to protect their wāhi tapu[11]; (ii) a strong desire to confront, reduce and mitigate the causes of ecological decline at Lake Waiorongomai; and (iii) an aspiration to express kaupapa tuku iho. For these reasons, it seemed more appropriate to begin the socially mediated process that constitutes the topic of this thesis by collectively creating an initial statement of intent that wove the various goals of importance to local hapū into one overarching, aspirational statement.

> *A kaupapa Māori research approach to the planning and restoration of Lake Waiorongomai for the cultural benefit and survival of whānau, hapū and iwi*[12]

The restoration priorities for Lake Waiorongomai that are described above were instigated by passionate whānau[13] and hapū members prior to this research project. A key contributor to this emerging vision for change was the late kuia and kaitiaki Horiana Joyce JP[14] who inspired the whānau and owners of the Waiorongomai blocks to support a restoration project. The late Jimmy Nichols who followed Horiana's lead then went to the Land Court to ensure that Lake Waiorongomai was gazetted as a Māori Reserve.[15] Financial assistance from local District and Regional Councils assisted early preparations including: (i) hui to facilitate dialogue among local land owners and

[10] Although there are various ways to start doctorate research studies, such as developing a method or process. For example Joanna Rosier's doctoral thesis submitted to the University of Queensland: Rosier, J., 1992, ESA-PLAN: An ideal planning framework for ecologically sensitive areas.
[11] Sacred site.
[12] T. Carkeek and R. Waaka, personal communication, 06 November 2015. Whānau (family), hapū (sub tribe, clan), iwi (tribe, nation).
[13] Family and includes owners/shareholders.
[14] Justice of the Peace.
[15] New Zealand Gazette, 3 April 2003, Setting apart Māori freehold land as a Māori Reservation, p. 913.

kaitiaki; and (ii) the contributions of external expertise, all of which resulted in the creation of initial restoration plans.[16,17] However, for various reasons the implementation of these earlier plans was unsuccessful. This doctoral research endeavour was initiated as an offer to assist this restoration initiative, in particular by linking it with emerging research collaborations[18] being developed at the time by the iwi organisation named 'Te Reo a Taiao Raukawa Environmental Research Unit' (Taiao Raukawa).

This doctoral research endeavour was able to assist local hapū with the creation and implementation of a new lake restoration plan that included provisions for: (i) appropriate governance structures; (ii) funding applications; (iii) the co-ordination of dialogue; and (iv) agreement on priorities for action among a diverse range of Māori land owners, farmers, community members and local authorities who shared a common desire to see Lake Waiorongomai restored. Lake Waiorongomai is a sacred dune lake of great significance spiritually, culturally and as a food source for the local iwi and hapū of Ngāti Raukawa ki te Tonga.[19] This sacred taonga[20] is located north of Ōtaki on the Kāpiti-Horowhenua Coast, in the North Island, New Zealand. As a remnant coastal dune lake and wetland, Lake Waiorongomai is recognised by local government as a regionally significant ecological site because of its habitats for wetland species. These habitats persist, even though Lake Waiorongomai has suffered from decades of ecological decline caused by destructive farming practices associated with stock management, including vegetation clearance and drainage. Despite visible evidence of

[16] Department of Conservation, 1993, Korero whiriwhiri mo te oranga o Waiorongomai: Conservation management of the Waiorongomai wetlands discussion paper. (unpublished draft report)
[17] Te Rūnanga o Raukawa Inc., 2011, Iwi Project: Restoration plan of Lake Waiorongomai, Otaki, Final phase report for Greater Wellington Regional Council. (unpublished report)
[18] The Manaaki Taha Moana programme.
[19] Ngā Kaitiaki o Raukawa, date unknown, Ngāti Toarangatira, Āti awa ki Waikanae, Ngāti Raukawa, Iwi Fisheries Claim Report, pp. 83-85. (unpublished report)
[20] Treasure.

wellbeing decline, it is still known as the "best dune lake with outflow to the sea in the Kāpiti District."[21] Coastal dune lakes are uncommon in New Zealand with the Northland and Horowhenua coastlines being the two main areas in the country where remnants of this coastal landscape feature can still be found.[22,23] A consequence of this rarity is that limited literature exists on research associated with these unique ecosystems or on efforts that have been made to restore them. This thesis broadens the scope of current literature in this area by contributing a kaupapa Māori research approach to the planning and implementation of dune lake restoration activities led by Māori and for Māori. The selection of an over-arching research methodology and methods that underpin this doctoral research contribution came into existence as a result of collaborative dialogue and the expression of rangatiratanga on the part of the whānau and hapū members of Waiorongomai.

The academic literature acknowledges that the coordination of research activities in a (doctoral) research endeavour of this kind is very difficult.[24] For this reason, the areas in which this doctoral research endeavour has been successful have been used as an opportunity for reflective inquiry in this thesis. This research[25] was immersed in mātauranga[26] Māori and especially tikanga[27], led by whānau and hapū with wider iwi

[21] Kāpiti Coast District Council, 1995, Kāpiti Coast District Council Plan, Heritage register, E. Ecological sites, K001, p. I-15.
[22] GWRC, date unknown, Key native ecosystem plan for Lake Waiorongomai and stream, p. 4. Note: currently under embargo until the release of this doctoral thesis.
[23] Others exist though for example a few remnant shallow dune lakes in the west coast of the Waikato and Waitomo region, refer to: www.waikatoregion.govt.nz/environment/natural-resources/water/lakes/shallow-lakes-of-the-waikato-region/
[24] Berkes, F., *et al.*, 2000, Rediscovery of traditional ecological knowledge as adaptive management; Cruz, M., *et al.*, 2014, Adaptive restoration of river terrace vegetation through iterative experiments, pp. 475-476, 485-486; Hardy, D., *et al.*, 2011, Assessing the holistic health of coastal environments: Research design and findings from cross-cultural research, Manaaki Taha Moana phase 1, pp. 5-9; Šunde, C., 2012, Building effective cross-cultural relationships in environmental management: A review and critique of the international literature.
[25] Note: 'creative activity' is used by some authors as explained in the New Zealand Government's '*Vision Mātauranga*' policy document as an alternative expression for the Western Scientific word 'research'. Ministry of Research, Science and Technology/Te Manatū Pūtaiao, 2007, Vision Mātauranga: unlocking the innovation potential of Māori knowledge, resources and people, p. 5.
[26] Knowledge, information, education.

and community support to plan, protect and restore Lake Waiorongomai and its surrounding wetlands. Drawing on my own previous life experiences in a farming community, whakapapa[28], employment in commercial science and university education, this research project incorporates aspects of kaupapa Māori, western science[29] and commercial adaptive management as key research methods. This complementary use of both Māori and Pākehā[30] research methods facilitated the achievement of whānau and hapū determined ecological and cultural outcomes. Specifically, research methods included: oral history interviews; a review of published literature; recording the expression of kaupapa and tikanga; hīkoi[31]; wānanga[32]; participatory action research; adaptive management; community-based ecological monitoring and learning; and qualitative and quantitative analysis. The application of these Māori and western science methods along with a collaborative approach to environmental planning has contributed to the early signs of: (i) an improved state of well-being in the Lake Waiorongomai ecosystem; and (ii) enhanced relationships between whānau, hapū, whenua and the wider community.

This thesis contributes to the current state of mātauranga Māori, kaupapa Māori and action research literature in a way that provides a richer cross-cultural understanding of environmental-planning practice. This is achieved by providing an example of how the complimentary use of Māori and western scientific research methods, contribute towards the success of an action-on-the-ground Māori-led restoration project of this kind. A further contribution of this doctoral thesis involves an attempt to characterise

[27] Custom, practice, protocol.
[28] Ngāti Raukawa, Ngāti Tukorehe, Ngāti Kapu, Ngāti Wehiwehi, Ngāti Toa Rangatira, Tainui-Waikato, Irish, Welsh, Scottish, English.
[29] One small aspect of an accumulated knowledge continuum from Europe (e.g. ancient Greece, Romans etc.) that laid the foundations for the western scientific revolution.
[30] Non-Māori, European.
[31] Walk.
[32] Learning, workshop, seminar.

this hapū-led, lake restoration journey in a way that offers new, Māori cultural insights to existing action research theory and practice. Combined with mentoring[33], this research experience has broadened my environmental passion to embark on holistic ecological restoration in support of the kaitiaki aspirations of my iwi, hapū and whānau.

Given the cross-disciplinary, cross-cultural, participatory and collaborative orientation of this research project, the question of how to effectively and appropriately communicate this journey in written form ideally requires some explanation. This explanation is partly provided in Chapter 4, which contains a sub-section that attempts to characterise the general preferences of the different audiences who are likely to engage with this doctoral thesis. This characterisation shows that the cross-disciplinary and cross-cultural content of this thesis is likely to appeal to at least five distinctive sets of reader preferences (i.e. hapū, pūkenga[34] Māori within Whare Wānanga[35], pūkenga Māori within Western Academies, Western Academics and professional planners). Given this diversity of worldview perspectives, the matter of reader audiences is discussed in greater detail in Chapter 4. This Chapter 1 concludes with an explanation of how the information presented in this thesis is written and organised in a way that affirms and accommodates the preferences of different readers. Developing a strategy to guide the written scholarship of this thesis in a way that affirms and accommodates the preferences of Māori, Pākehā and professional readers represents an additional scholarly contribution of this doctoral thesis.

[33] From Ngā Hapū o Ōtaki kaitiaki members – Te Waari Carkeek, Rupene Waaka and Caleb Royal; Manaaki Taha Moana Horowhenua Research Leader – Dr Huhana Smith; Greater Wellington Regional Council Biodiversity Officers – Tim Park and Michael Urlich; Kāpiti Coast District Council Biodiversity Officer – Rob Stone; and Department of Conservation Ngā Whenua Rāhui staff – Richard Anderson and Rangimarkus Heke.
[34] Scholars.
[35] Māori tertiary institution of higher learning.

For the sake of providing initial explanation about the organisation of the information in this first chapter, the following elaboration is provided as a guide for the reader. The written narrative, descriptions and explanation presented in this first Chapter (as well as Chapters 2 & 3) follow the tikanga Māori of acknowledging the past first (i.e. our origins and whakapapa). A preference for treating time in this manner was a popular method used (traditionally) by Māori in oral narratives used to transfer knowledge. For example, reciting whakapapa which transcends from earlier ancestors to the present day, acknowledging that without those respected individuals, we would not exist. Based on a writing style of this kind, the remaining sub-sections in this first chapter are organised as follows. Sub-sections 1.1 and 1.2 explain how Taiao Raukawa and the Manaaki Taha Moana research programme supported this hapū-led case study with action on the ground. Sub-section 1.3 introduces the Lake Waiorongomai case study, along with the role of Ngā Hapū o Ōtaki as one of the main governing bodies. Sub-section 1.4 outlines the aims and objectives of the restoration project in a way that explains how these are related to this doctoral research endeavour, as all these strands were woven together from the start. Finally, sub-section 1.5 explains how the remaining chapters in this thesis are organised.

1.1 The relationship between Te Reo a Taiao Raukawa Environmental Research Unit and this doctoral research project

Te Reo a Taiao Raukawa Environmental Research Unit (Taiao Raukawa) was setup and registered in 2008 to gather and share environmental information while providing leadership and support for ecological strategies of benefit to the iwi and hapū of Ngāti Raukawa ki te Tonga.[36] Ngāti Raukawa ki te Tonga is composed of 25 hapū

[36] Please refer to www.taiaoraukawa.co.nz.

with almost the same number of marae[37] that are affiliated to the iwi within our rohe[38].[39] The rohe itself includes an area from Kukutauaki Stream just north of Waikanae to Waitapu Stream at the upper reaches of the Rangitikei River, and runs west from the Tararua Ranges to the ocean (Figure 1.1.1).[40] Some Ngāti Raukawa ki te Tonga affiliated hapū are also (at times) recognised as iwi in their own right.[41]

[37] Meeting place/building of tribe/sub-tribe/village.
[38] Territory.
[39] Te Runanga O Raukawa Inc. 21st September 2014, 26th Annual report, pp. 9-11, 67.
[40] Luke, D., 2014, Te Aho: The woven strands, p. 18.
[41] One example is Ngāti Tukorehe with associated hapū Ngāti Rangitawhia, Te Mateawa, Ngāti Manu and Ngāti Kapumanawawhiti ki Kuku. (Source: Smith, H., 2012, Hei Whenua Ora Te Hākari. Reinstating the mauri of valued ecosystems – history, lessons and experiences from the hei whenua ora ki Te Hākari/Te Hākari dune wetland restoration project, p. v).

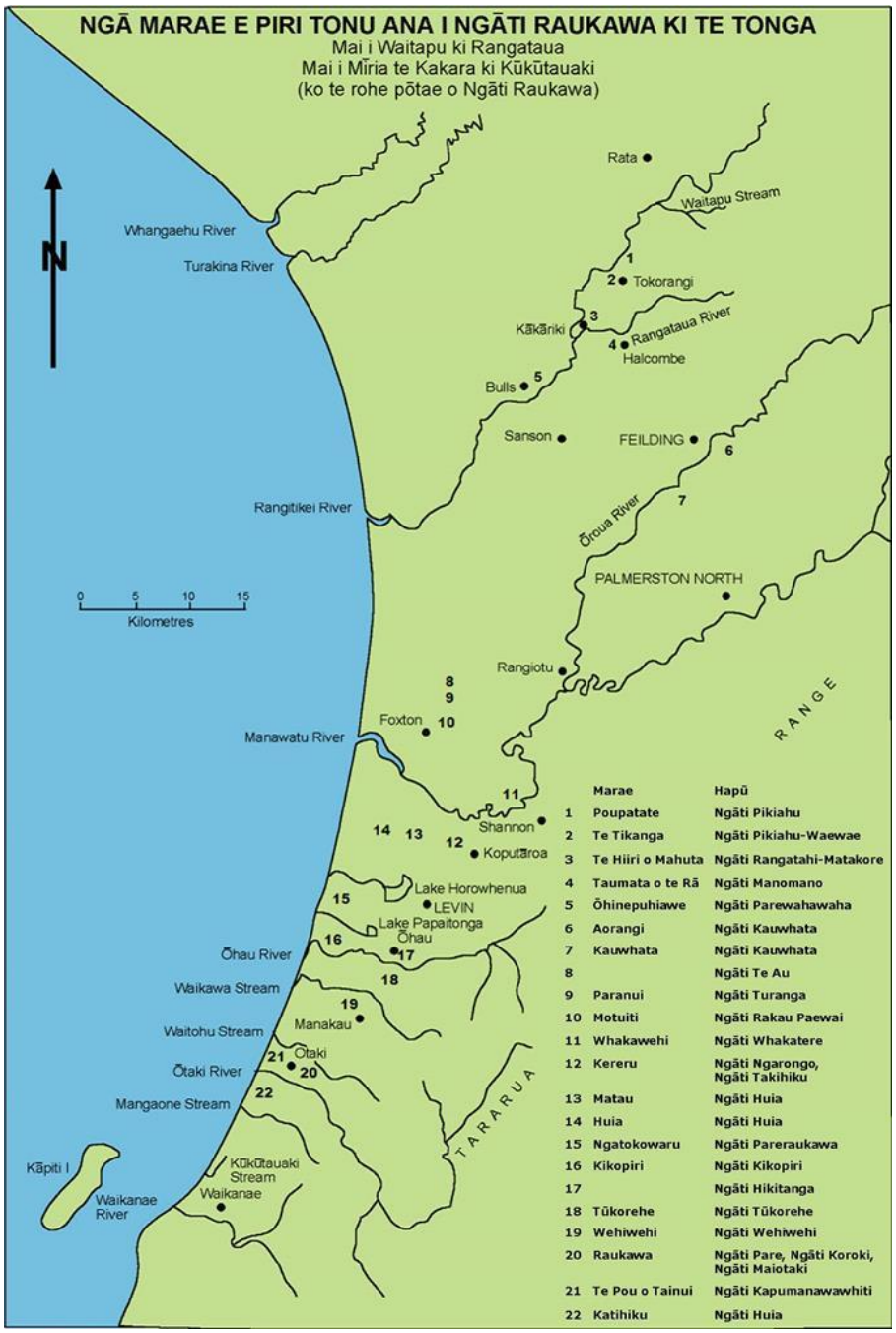

Figure 1.1.1 Ngāti Raukawa ki te Tonga rohe, hapū and marae. *(Source: Te Runanga O Raukawa Inc.,, 2014, p. 67.)*

Prior to this doctoral research project, I was employed as a Kairangahau/Iwi Researcher for Taiao Raukawa to participate in project activities relating to iwi and hapū environmental concerns. The Manaaki Taha Moana[42] (MTM) research programme was

[42] Manaaki Taha Moana: Enhancing Coastal Ecosystems for Iwi and Hapū (MAUX0502).

the largest research project that Taiao Raukawa had engaged in at the time. External funding and hapū support were imperative to achieve positive case study outcomes for the hapū. The three female personnel in Taiao Raukawa and the MTM Horowhenua team are whakapapa related to Ngāti Raukawa ki te Tonga and to each other. They are Dr Huhana Smith, Moira Poutama and myself, Aroha Spinks. As MTM researchers, we each had project management roles in supporting the six local hapū-led case studies described in more detail in the following section.

As a condition of my employment contract through Taiao Raukawa, I was offered the opportunity to conduct a PhD research project in an area relating to the MTM research programme. Together with funding assistance provided by Manaaki Taha Moana, Waikato-Tainui Doctoral Scholarship funding and Raukawa Education Grants, Taiao Raukawa made it possible for me to engage in and concentrate on doctoral studies, whilst participating in the Lake Waiorongomai restoration project. In this thesis I argue that having paid iwi members available to support hapū restoration initiatives is a key contributing factor to the success of iwi projects that deal with the complexity involved in improving ecosystems and hapū wellbeing.

1.2 The relationship between Manaaki Taha Moana and this doctoral research project

The Manaaki Taha Moana (MTM) research programme was a Ministry of Business, Innovation and Employment[43] (MBIE) funded research project (MAUX0907) running over six years from October 2009 to September 2015. The aim of the MTM programme was to restore and enhance coastal ecosystems and those ecosystem services of importance to iwi and hapū, through a better knowledge of these ecosystems and the

[43] Formerly known as, and government funded by the Ministry for Science and Innovation.

degradation processes that affect them.[44] This integrative, dynamic, cross-cultural research programme actively engaged local communities to: (i) address causes of ecological decline identified as being of importance to hapū and iwi; and (ii) begin practical steps to ensure positive changes for the future. The programme has a detailed website that acted as an information portal, with online publications, and other useful outputs such as: photos, video recordings of interviews and aerial video footage captured during kapowai (drone) fly-overs of case-study sites. These resources have been made freely available for public viewing in order to disseminate the lessons learned from individual research projects.[45] The MTM collaborative cross-cultural research team aspired to conduct research that empowered iwi and hapū to: (i) lead coastal restoration projects; and (ii) deploy sustainable resource management practices within their rohe. The research project described in this thesis draws on a number of research methods and tools that were used in the MTM research programme drawn from mātauranga Māori, western science and the use of emerging technology.

The five research providers involved in the MTM collaborative project were: Massey University, Cawthron Institute, Taiao Raukawa, Manaaki Te Awanui and Waka Digital. The contributions made by the MTM organisations and their individual research teams were recognised as having over achieved their contractual requirements with MBIE in 2014 and 2015; and thus received a gold star rating.[46] The cross-cultural research approach developed in the MTM programme made it possible for mātauranga Māori and western scientific knowledge systems to co-exist and be enhanced in a collaborative way.[47] However, this cross-cultural approach to project governance and method was

[44] Hardy, D., *et al.,* 2011, p. 1.
[45] For further information please refer to www.mtm.ac.nz.
[46] Ibid.
[47] Smith, H., *et al.,* 2011, State of ecological/cultural landscape decline of the Horowhenua coastline between Hokio and Waitohu Streams, p. 23.

not fully replicated in the Lake Waiorongomai case study. In particular, whānau and hapū expressed the desire to adopt a kaupapa Māori approach as the basis of their involvement in the restoration of Lake Waiorongomai. A detailed explanation of the methodology used in this doctoral thesis is outlined in Chapter 4.

The MTM programme had two regional case studies, Tauranga Harbour and Horowhenua Coastline (Figure 1.2.1). The Tauranga regional iwi case study: engaged in mediated modelling workshops; created a cultural health index; and conducted a comprehensive ecological survey of Tauranga Harbour. The Horowhenua regional case study was based on six hapū-led action-research case studies, one of which was the Lake Waiorongomai restoration project.

Figure 1.2.1 Manaaki Taha Moana regional case studies (Tauranga Harbour and Horowhenua Coast). *(Source: Ruth, M. (Ed)., 2015, p. 51.)*

The MTM Horowhenua project was designed by Dr Huhana Smith and was based on her doctoral research[48] involvement in the Te Hākari Dune Wetlands Restoration project (Figure 1.2.2) and the 'Ecosystem Services Benefits in Terrestrial Ecosystems for Iwi and Hapū'[49] programme. The research approach used in the Horowhenua case studies of MTM was based on a 'dynamic methodological approach' that: (i) incorporated aspects of socio-bio-cultural systems; and (ii) utilised the expertise of external organisations and individuals.[50] The Horowhenua regional case study extended along a 17km stretch of coastline from the Hōkio Stream in the North to the Waitohu Stream in the South. The aim of the Horowhenua research project was to support hapū in the expression of kaitiakitanga[51] generally and the restoration of coastal ecosystem wellbeing specifically. Consistent with the expression of rangatiratanga, hapū were invited to identify local ecological decline issues and potential restoration case studies within their rohe during initial hui and hīkoi held in phase one of the project (2010-2011). Taiao Raukawa supported the MTM Horowhenua team, who worked alongside kaitiaki nominated by their hapū to identify and narrow down a potential list, to a final list of six case studies. The six case studies were: (1) Waiwiri Stream from Lake to Sea; (2) Ōhau River Loop; (3) Kuku Ōhau Estuary Enhancement; (4) Ransfield's Wetland Kawenata; (5) Lake Waiorongomai Restoration Project; and (6) Shellfish Survey (Figure 1.2.2). This doctoral thesis focuses only on the Lake Waiorongomai case study. Further information on the other five Horowhenua hapū case studies is contained within publications available on the MTM website.[52] The Lake Waiorongomai restoration project identified

[48] Smith, S., 2007, Hei Whenua Ora: Hapū and iwi approaches for reinstating valued ecosystems within cultural landscape.
[49] Foundation of Research Science and Technology contract number MAUX0502.
[50] Smith, H, *et al.*, 2014, He Tirohanga Whānui: An overview of ecosystems undergoing rehabilitation with Manaaki Taha Moana Research Project and the Horowhenua case study, pp. 16-17.
[51] Guardianship, stewardship.
[52] Please refer to www.mtm.ac.nz. For example: Smith H., *et al.*, 2011, State of ecological/cultural landscape decline of the Horowhenua coastline between Hokio and Waitohu Streams; Smith, H, *et al.*,

by the number ‘5’ in Figure 1.2.2 was not included in MTM publications. This omission was deliberately guided by the whānau and hapū who are kaitiaki of Lake Wairorongomai. With regards to the production of written publications recounting the Lake Waiorongomai restoration project, whānau and hapū endorsed the production and publishing of *this* doctoral thesis and one journal article. This whānau request is respected. Thus, intellectual property of the hapū-led creative activities and use of project resources associated with this restoration project resides with the whānau and hapū of Waiorongomai. This doctoral thesis draft was reviewed by kaitiaki[53] and deemed as a culturally appropriate contribution to Māori scholarship.

2014, He Tirohanga Whānui: An overview of ecosystems undergoing rehabilitation with Manaaki Taha Moana Research Project and the Horowhenua case study.

[53] Te Waari Carkeek, Rupene Waaka, Caleb Royal, Tanira (Rolly) Raureti, Libby Hakaraia and Ariana Te Aomarere.

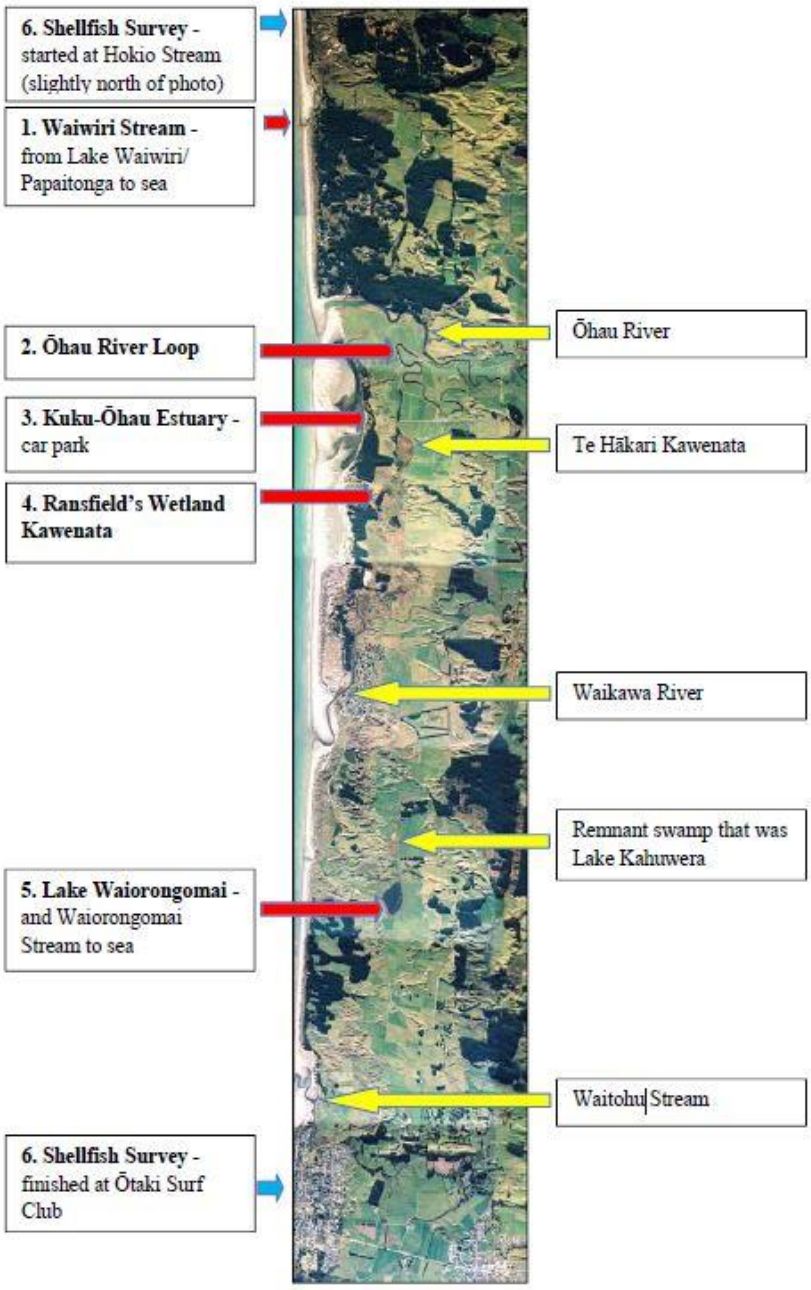

Figure 1.2.2 Manaaki Taha Moana Horowhenua six local case studies (numbered 1 to 6). *(Adapted using a stitch of aerial photos from source: Laurie Cairns, June 2009, Ahi Kaa Roa - Mapping Cultural Landscape project. Photo supplied by Te Iwi o Ngāti Tukorehe Trust)*

In addition to the gold star rating conferred on MTM by MBIE, the six case studies associated with the Horowhenua project of the MTM programme received official recognition by a local Crown agency. The Taiao Raukawa team involved in MTM, along with kaumātua[54], whānau, hapū and kaitiaki from Ngāti Raukawa ki te Tonga and other iwi affiliates, received acknowledgement for their efforts across the six MTM case studies. The Department of Conservation (Manawatū) acknowledged the value of this collective contribution to coastal ecosystem wellbeing by awarding the project and team the inaugural 'Kaitiakitanga Conservation Award' at Raukawa Marae in Ōtaki on Wednesday 11th September 2013.[55] These case studies also received additional national and international awards as a result of a creative collaboration between the Landscape Architecture Department of Victoria University and five of the MTM case studies associated with the Horowhenua project. This endorsement is elaborated in the next sub-section.

1.2.1 The relationship between Victoria University and this doctoral research endeavour

The MTM Horowhenua team developed a relationship with the Victoria University Landscape Architecture Department, and worked closely with Professor Penny Allan to develop a bi-cultural design studio for working with tangata whenua[56].[57] This design studio was not only bi-cultural, but it was action-based (described in further detail in Chapter 6, Sub-section 6.1.4). Fourth year masters students in landscape architecture actively participated in wānanga where they were immersed in tikanga marae and mātauranga for varying periods of time. This provided opportunities for

[54] Elder.
[55] http://www.doc.govt.nz/news/media-releases/2013/celebrating-conservation-champions-in-our-community/
[56] People of the land, indigenous people.
[57] Allan, P., & Smith, H., 2013, Research at the interface: bi-cultural studio in New Zealand – a case study.

them to listen to the local concerns and dreams of hapū and kaitiaki members. Then, using hīkoi methodology (see Sub-section 6.3.6), they visited the case study sites and were invited (and inspired) to create designs which were presented back to the hapū and community. These wānanga were very successful as students benefited from the marae and wānanga experiences. Hapū also received some practical and innovative designs, which were recognised in the awards received for this collaborative bicultural initiative. On the 7th of November 2014, some of these students and their hapū inspired designs were recognised with a second equal award at the International Landscape Architecture Exhibition of University Projects in Barcelona.[58] The bi-cultural design project then won the Te Karanga o te Tui award of excellence at the NZ Institute of Landscape Architects awards in Rotorua 2015.[59] All of these achievements included input from the whānau, hapū and kaitiaki members involved in the Lake Waiorongomai restoration project and recognised their expression of kaitiakitanga.

1.3 Iwi and hapū links to Lake Waiorongomai

Coastal dune lakes are rare and important ecosystems in the New Zealand landscape found most commonly on the West Coast of the North Island, formed between dune belts in conjunction with wetlands.[60] Inland waterways (including rivers, lakes and wetlands) are considered of significant cultural importance to local iwi and hapū, not only spiritually but also as a food source and as a focus of cultural identity

[58] http://www.victoria.ac.nz/architecture/about/news/2014-news/victorias-landscape-architecture-programme-world-class

[59] http://www.victoria.ac.nz/news/2015/03/winning-landscape-architecture-project -embraces-bicultural-values

[60] Dean-Speirs, T., & Neilson, K., 2014, Waikato region shallow lakes management plan: Volume 2: Shallow lakes resource statement: Current status and future management recommendations, p. 160; Greater Wellington Regional Council, date unknown, Key native ecosystem plan for Lake Waiorongomai and Stream final draft report, p. 3 (unpublished report); Stephens, T., *et al.*, 2018, Managing land-use effects on Northland dune lakes: lessons from the past, p. 1; Waikato regional council website: www.waikatoregion.govt.nz/Environment/Environmental-information/Environmental-indicators/Lakes/lake10-report/lake10-techinfo/

and well-being.[61] These coastal dune lakes are thought to have been created in the Holocene Epoch. Sand migrated landward as sea levels rose. Swells and prevelant west-northwesterly winds formed a transgressive dune field in the Wanganui-Manawatū-Horowhenua region, approximately 900km^2.[62] Beaches readjusted to the new level, and onshore winds created new dunes which frequently blocked small watercourses which were flowing westwards across the Pleistocene marine terraces - forming small lakes along the coast.[63] They may also be groundwater fed as in the case of Lake Waiorongomai. Coastal dune lakes are perhaps one of the rarest and most threatened aquatic habitats in the world.[64] They are increasingly threatened by pressures including: (i) economic incentives; (ii) demand for rural land to support the expansion and intensification of agriculture, horticulture and forestry; (iii) demand for urban land to support urban, peri-urban and ribbon housing development along with accompanying service infrastructure; and (iv) introduction of invasive species.[65] A net result of these pressures has been ecosystem decline, local species extinctions, reduced landscape connectivity, and loss of cultural landscape integrity. Although there is often less known about coastal dune lakes they are usually considered to be high in biodiversity and worthy of protection due to the difficulty in re-establishing them once they have collapsed.[66] The Greater Wellington Regional Council (GWRC) State of the

[61] Clarkson, B., *et al.*, 2013, Wetland ecosystem service, p. 192; Potter, H., *et al.*, 2017, Porirua ki Manawatū Inquiry: Inland waterways historical report, p. 33. (unpublished report)
[62] Clement, A., *et al*., 2018, Late Quaternary geomorphology of the Manawatu coastal plain, North Island, New Zealand, pp. 36-45.
[63] Ibid.
[64] Coastal dune lakes in South Walton County in the Gulf of Mexico website: http://sowal.com/coastal-dune-lakes-of-south-walton-county; Northland Regional Council website: https://www.nrc.govt.nz/Environment/Water/Lakes/; Stewart, A., 2017, The geoarchaeology of Lake Michigan Coastal Dunes book review, p. 599 (original publication written by Lovis, W., Arbogast, A., & Monoghan, G. in 2012).
[65] Dean-Speirs, & Neilson, 2014, pp. 11, 160; Greater Wellington Regional Council, date unknown, pp. 3-6 (unpublished report); Northland Regional Council website: https://www.nrc.govt.nz/Environment/Water/Lakes/; McLellan, C., & Kokich, D., 1985, The Kai Iwi – Pouto Dune Lakes: A water resources report, p. 10; Stephens, T., *et al.*, 2018, p. 3.
[66] Dean-Speirs, & Neilson, 2014, pp. 160- 162, 177-179; Stephens, T., *et al.*, 2018, p. 1.

Environment Report 1999 noted that, although it is difficult to measure[67], an estimated 90%[68] of the regions wetlands have disappeared.[69]

1.3.1 Lake Waiorongomai

The geographical location of Lake Waiorongomai is GPS latitude 40°42'44.23"S and GPS longitude 175°8'34.10"E.[70] The Lake Waiorongomai ecosystem, with surrounding wetlands and associated sand dune features, is located three kilometres north of Ōtaki Beach and two kilometres south of Waikawa Stream on the Kāpiti-Horowhenua coastline (Figure 1.3.1). In pre-Pākehā-settlement times, the Kāpiti Coast and the Horowhenua region coastline (within the Porirua to Manawatū region) had an extensive system of wetlands stretching from Paraparaumu to Foxton (Figure 1.3.2). The region between the Tararua foothills and the beach was thick in diverse forest associations, with coastal swamps and lagoons abundant with eels.[71] Local iwi and kaumātua narratives describe travelling through this inland coastal margin on waka.[72]

[67] Due to them having been drained, filled or otherwise lost.
[68] Approximately 103,000 ha (13%) of the regions total area.
[69] The Regional Wellington Council, 1999, Measuring up: The state of the environment report for the Wellington region 1999, pp. 87-89.
[70] Luke, 2014, p. 47.
[71] Carkeek, W., 1966, The Kapiti Coast: Maori history and place names, p.1.
[72] T. Carkeek, personal communication, 12 November 2011.

Figure 1.3.1 Aerial photo of coastline - Waikawa River outlet to Lake Waiorongomai. *(Source: Laurie Cairns, June 2009, Ahi Kaa Roa- Mapping Cultural Landscape project. Photo supplied by Te Iwi o Ngāti Tukorehe)*

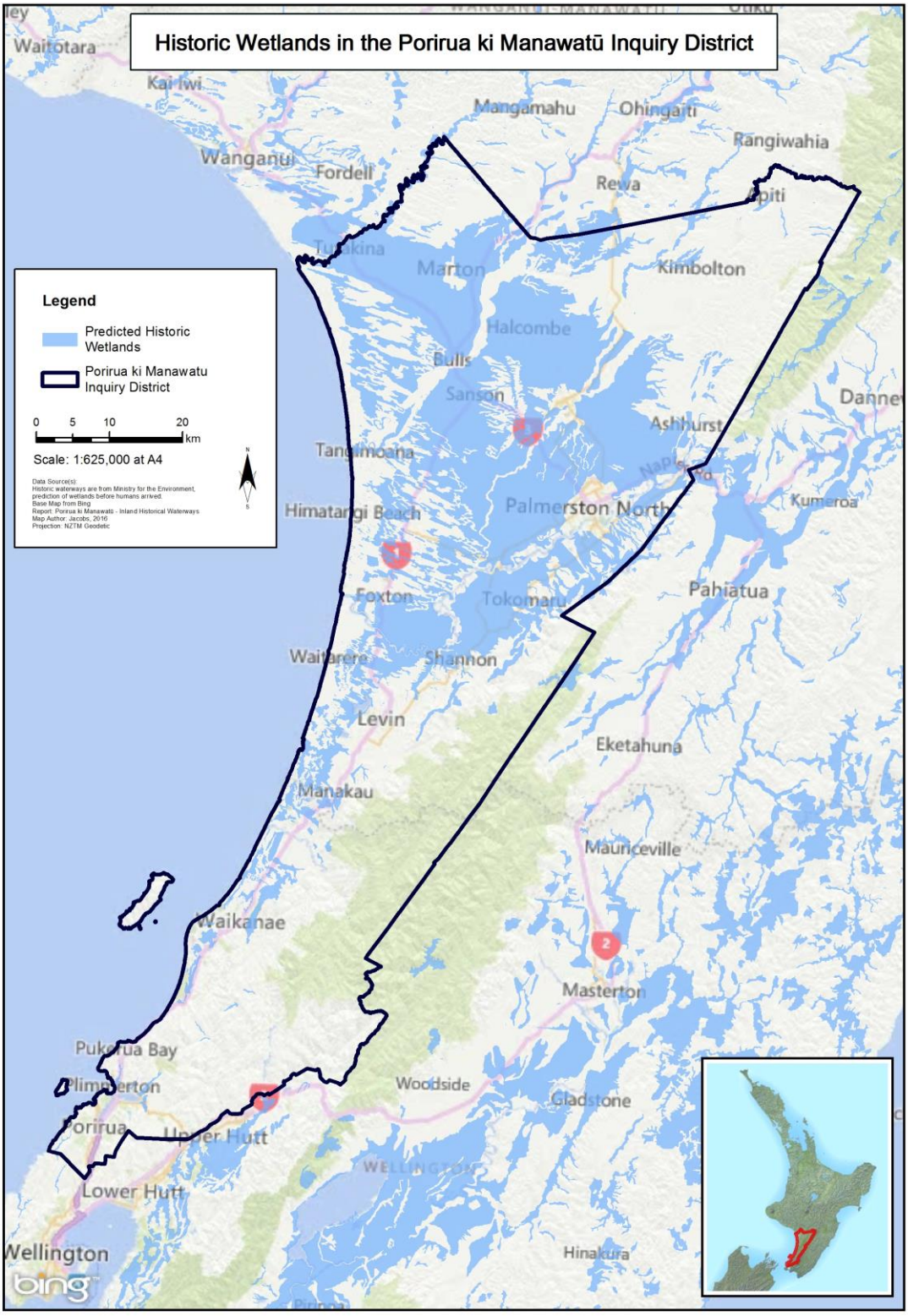

Figure 1.3.2 Historic wetlands in the Porirua ki Manawatū Inquiry District. *(Source: Potter, H., et al., 2017, p. 142)*

The Waiorongomai Block 10 (Figure 1.3.3) is privately owned Māori land that surrounds and includes Lake Waiorongomai and the Waiorongomai Stream.[73] Collectively Waiorongomai Block 10 has approximately 700 owners, including some whānau trusts as legal entities. The block is also managed by the Waiorongomai 10 (Lake) Trust that has appointed Trustees. The restoration area includes five adjacent land blocks: Waiorongomai 1A; Waiorongomai 3A; Waiorongomai 3B1; Waiorongomai 3B2 and Waiorongomai 3B3 (Figure 1.3.3). All six blocks have in excess of a thousand owners. Details of all individual owners and those represented by whānau trusts and current trustees can be viewed on the Te Kooti Whenua Māori website.[74]

Figure 1.3.3 Waiorongomai blocks involved in the Lake Waiorongomai restoration project. *(Source: Waaka, R., 6 March 2014, Presentation Slide 27)*

[73] Refer to Figure 1.3.3 for block boundaries.
[74] Refer to Māori online website (www.maorilandonline.govt.nz).

1.3.2 Iwi and hapū of Waiorongomai

While the ecological and cultural history of Lake Waiorongomai is covered in greater detail in Chapter 3, it is important at this point to briefly acknowledge and affirm the central role played by associated hapū and whānau in both this restoration project and doctoral research endeavour. It is known that one of the significant uses of Lake Waiorongomai, was the process of whakanoa[75] used by Te Rauparaha and his warriors to cleanse after battles.[76] Thus the tūpuna[77] of Ngāti Toarangatira, Te Āti Awa ki Whakarongotai and Ngāti Raukawa ki te Tonga formed a wairua relationship with this significant cultural site. The Ngāti Raukawa ki te Tonga hapū papakāinga sites that surrounded Lake Waiorongomai (as identified by Miki Rikihana in the Iwi Fisheries Claim Report[78]) are: Ngāti Maiotaki; Ngāti Waihurihia; Ngāti Moewaka; Ngāti Pare; and Ngāti Koroki. The Ōtaki Māori Land Court[79] records divided the original Waiorongomai Block of 1,963 acres amongst three hapū: Ngāti Maiotaki; Ngāti Waihurihia; and Ngāti Moewaka. The five hapū of the Ōtaki district formed Ngā Hapū o Ōtaki that is now recognised as the iwi authority for the Ōtaki region. The hapū represented by this organisation are: Ngāti Koroki; Ngāti Maiotaki; Ngāti Huia ki Katihiku; Ngāti Pare; and Ngāti Kapu. The author took on a supportive role in the Lake Waiorongomai restoration project after a successful tono[80] (in accordance with Māori protocol) to the Lake Waiorongomai 10 Trust and hapū members who attended a hui in Taaringaroa, Raukawa Marae in Ōtaki on the 24th of November 2012.[81] At the same

[75] Free from sacredness, to make ordinary.
[76] The cultural and historical context of the Waiorongomai Blocks and the significance of Lake Waiorongomai as a wāhi tapu is described in greater detail in Chapter 3.
[77] Ancestor/s.
[78] Ngā Kaitiaki o Raukawa, date unknown, pp. 83-85. (unpublished report)
[79] Formerly known as the Native Land Court.
[80] To request, bid.
[81] It is important to point out that access to this site of cultural significance is restricted. The whānau, hapū, iwi, owners and leasee farmers request people respect this precious site and refrain from visiting unless they have received permission and follow correct cultural protocols.

time, the chairperson of the Trust (the late James Nicholls) and hapū members also approved the initiative to start the restoration project, and to apply for funding to fence Waiorongomai Block 10.

The Lake Waiorongomai restoration project, as a hapū-led project would not have been possible without the efforts and support of the owners, whānau, hapū, iwi, trustees, leasee farmers and other local entities. Significant funding and mentoring from GWRC, Kāpiti Coast District Council (KCDC) and the Ngā Whenua Rāhui (a division of the Department of Conservation) aided the restoration efforts. Community organisations contributed considerably through providing expertise, resources and student involvement. Specifically it is important to acknowledge the support of Hapai Whenua Consultants, Te Kura-ā-Iwi o Whakatupuranga Rua Mano (Whakatupuranga Rua Mano) and Te Kura Kaupapa Māori o Te Rito (Te Rito), NZ Forest and Bird Society Horowhenua, and Winstones Aggregates. A mihi[82] to all those who have shared knowledge and experiences that have been collated and displayed within this thesis.[83]

1.4 Aims of this doctoral research endeavour and the Lake Waiorongomai restoration project

This doctoral thesis documents a kaupapa Māori research process that contributed investigative and reflective inquiry to the Lake Waiorongomai restoration project. For this reason, in this introduction chapter, it is necessary to clarify the difference between the aims of: (i) this (doctoral) research endeavour; and (ii) the much larger Lake Waiorongomai restoration project. Elaboration of this kind supports an academic writing style where there is a need to clearly communicate the contributions of individual research parts towards a greater whole. However, by using only an academic

[82] Acknowledge, thank.
[83] With whānau, hapū and associates permission.

approach there is a danger of losing sight of the influence that a holistic Māori worldview has in weaving together the various parts of the two inter-connected activities. While this doctoral research project has a stated aim, the pursuit of this aim over the last six years has been inextricably connected with and related to the aims of the larger Lake Waiorongomai restoration project.

The purpose of this hapū-led action-research doctoral investigation was to help the whānau and hapū to achieve their aspirations to *enhance and restore the natural ecosystems*[84] *present around Lake Waiorongomai, by protecting and revitalising this taonga including: its waterways; native fauna; flora; and habitats*. By taking these enhancing and restorative measures, whānau and hapū envisaged revitalising the mauri[85] within Lake Waiorongomai, its tributaries, surrounding wetlands and whenua.

The primary aim in writing this thesis was to provide a comprehensive narrative of the restoration and research. There are two reasons for this writing goal. First, to better understand how whānau and hapū were able to give effect to the aspirations contained within this primary aim statement. Second, to use these reflections to expand the field of action research to include Māori cultural perspectives.

Whakapapa - the whānau relationships between all things - is central to a Māori way of perceiving the world,[86] which is, in turn, closely related to the expression of ūkaipōtanga[87] or the nurturing of whānau members. The Lake Waiorongomai restoration project contributed to ecological restoration and by doing this: (i) repaired and strengthened whakapapa relationships; and (ii) created a focal point for the

[84] From a Māori worldview whānau and hapū are an integral part of an ecosystem. This point is explained in greater detail in Chapter 2.
[85] Life force.
[86] Marsden, M., & Henare, T., 1992, Kaitiakitanga: A definitive introduction to the holistic world view of the Maori, p. 21.
[87] To return home/source.

expression of ūkaipōtanga for whānau, hapū and iwi participants. This project outcome was considered by whānau and hapū to be an important aim of the Lake Waiorongomai restoration project.

Finally, the aim of including community-based ecological monitoring in this doctoral research endeavour was to provide whānau and hapū with a tool that they could use to evaluate future restoration change against initial baseline data. The ability to compare data trends with respect to time also supported an adaptive and responsive, management and planning approach.

1.5 Thesis description and organisation

This thesis contains a kete[88] of knowledge relating to the development of plans, research and creative artistic activities associated with the restoration of the Lake Waiorongomai ecosystem. It is a basis for reflection and cross-cultural dialogue on existing action research theory and practice. This thesis is also a direct consequence of my involvement in the MTM programme, Lake Waiorongomai restoration project and is envisaged to be of benefit to associated whānau, hapū and their mokopuna[89].

In addition, this doctoral thesis attempts to accurately document the historical narrative relating to the Lake Waiorongomai restoration project, and attempts to acknowledge the many contributions made by whānau, hapū, iwi members and wider community. The reflection and cross-cultural dialogue portion of the thesis involves my interpretation of our collective restoration and research. In support of these writing aims, the organisation of remainder of this thesis is outlined below.

[88] Bag, basket.
[89] Grandchildren, descendants, future generations.

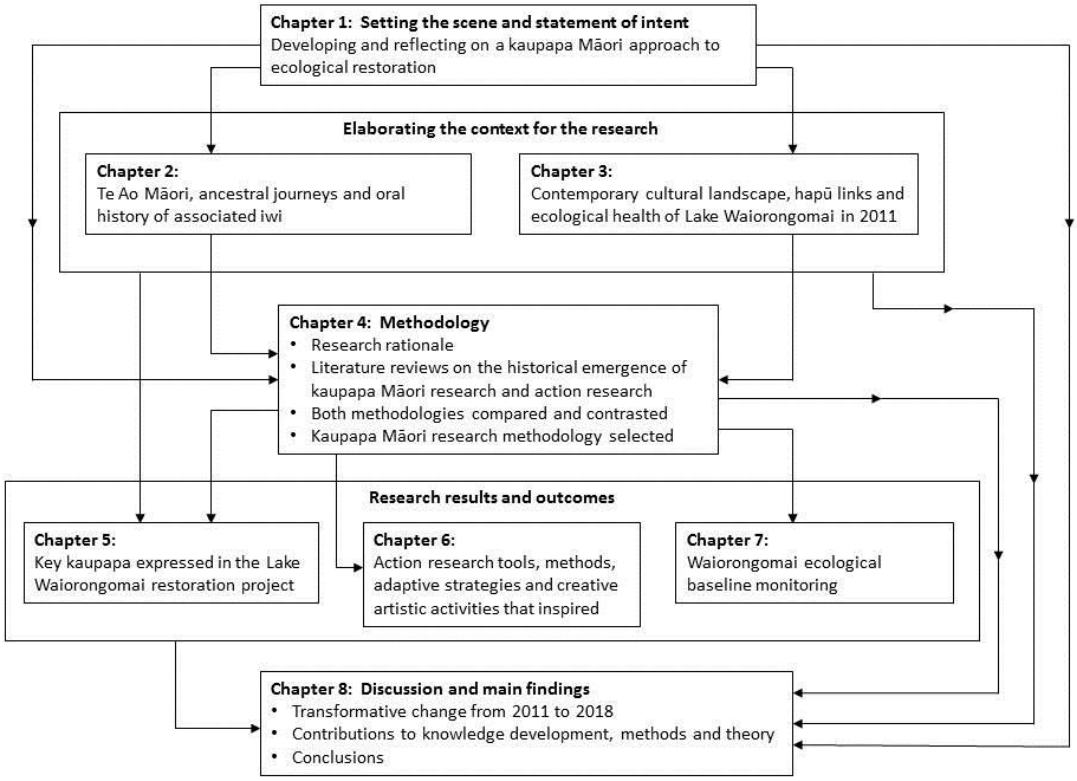

Figure 1.5.1 Chapter links in this doctoral thesis.

Chapter 2 (Figure 1.5.1) provides an introduction to: (i) a Māori worldview by outlining key characteristics of the whakapapa of 'Te whānau ā Ranginui rāua ko Papatūānuku'[90]; (ii) the pūtaiao[91] experiences of our tūpuna and how these influenced their wellbeing and that of the natural world; and (iii) a brief historic account of iwi and hapū journeys from Hawaiiki to the Kāpiti Coast and Horowhenua region. Chapter 3 (Figure 1.5.1) continues the historical narrative outlined in Chapter 2 from the early 1800s up until the beginning of the Lake Waiorongomai restoration project and focuses attention on: (i) the cultural significance of Lake Waiorongomai; along with (ii) a description of

[90] The extended family of the sky father (Ranginui) and earth mother (Papatūānuku).
[91] Science.

contemporary social and ecological issues and; (iii) the aspiration of local whānau and hapū.

Chapter 4 (Figure 1.5.1) describes the methodology and methods used in this doctoral research endeavour. Chapter 5 (Figure 1.5.1) provides a co-constructed narrative on the expression of kaupapa and tikanga in restoration project from my perspective and the reflections of others during oral interviews. Chapter 6 (Figure 1.5.1) provides a reflection on the use of action-research tools, adaptive strategies and creative artistic activities that supported the fulfilment of hapū aspirations in this restoration project. Chapter 7 (Figure 1.5.1) documents the methods used and results of the ecological baseline monitoring.

Finally Chapter 8 (Figure 1.5.1) summarises the key research findings from this case study. It highlights contributions to theoretical literature within a resource and environmental planning discipline. Limitations and areas that could be improved or broadened are also suggested.

Figure 1.5.2 Lake Waiorongomai 2014 photo with view to the sea. *(Source: Taken by Mihali Katsougiannis, 23 April 2014, Victoria University landscape architecture student)*

Chapter 2 Whakapapa, whenua and cultural links to Kāpiti-Horowhenua

He aha te koha nō koutou i whakaoramauri, i hua mai nei

he whenua, he wai, he rākau, he kararehe.

What are the gifts we carry to sustain life, flourish,

the land, the water, the plants, the animals.

The aim of Chapter 2 is to provide detailed information about the recent human settlement history, and cultural significance of the Kāpiti Coast and Horowhenua region. This background information is important to this doctoral thesis. For Māori, resource and environmental planning in New Zealand should incorporate local iwi[92] cultural identity, kaupapa[93] and tikanga[94], as well as ancestral and cultural landscapes.[95] As noted in Chapter 1, the expression of kaupapa and tikanga as part of ecosystem restoration should not be considered in isolation from the equally important goal of enhancing the wellbeing of those whānau[96] and hapū[97] who whakapapa[98] to this ecosystem. In a Māori worldview, atua[99] Māori, ecosystems and humans are

[92] Tribe, nation.
[93] Values, issue, strategy.
[94] Custom, practice, protocol.
[95] Dick, J., *et al.*, 2012, Listening to the kaitiaki – consequences of the loss of abundance and biodiversity of coastal ecosystems in Aotearoa New Zealand, p. 128.
[96] Family, extended family.
[97] Sub-tribe, clan.
[98] Genealogy.
[99] Gods, deities.

inextricably interrelated by whakapapa.[100] To shed light on these interrelationships, Chapter 2 also attempts to provide fundamental insights into Māori worldview[101] assumptions and perceptions of reality on which a Māori value-based approach to ecosystem restoration is based. A brief overview of the key ideas that are outlined in the remainder of this chapter is provided here.

First, the whakapapa relationship between Māori and the natural world is a cultural identity that is a real-world expression of the various assumptions about reality associated with a Māori worldview. While the word 'worldview' has been increasingly adopted by modern Māori scholars in both universities and Whare Wānanga[102], an interesting question concerns just how this academic concept - which derives from German philosophy - is related to mātauranga[103] Māori. Reverand Māori Marsden attempted to answer this question by suggesting that Māori view the world simultaneously from three different reference points (i.e. Tua-uri (the realm of mauri), Te Aro-nui (the realm perceived by human senses), and Te Ao Tua-ātea (the spiritual realm of Io Matua Kore[104] that is beyond the time-space continuum).[105] This explanation is relevant to this discussion because it shows that our tūpuna[106] had their own perspective on the world.

In the remainder of this Chapter and thesis possible confusion is avoided by use of the Māori term 'Te Ao Māori' when making direct reference to what might be considered a generalised Māori way of viewing the world. A worldview generalisation of this kind is only relevant and helpful for the sake of academic discourse such as that outlined in this

[100] Potter, *et al*., 2017, p. 43; Interview with Te Kenehi Teira, 12 October 2016, at Archives New Zealand,, Wellington, Interviewer Moira Poutama (cited in Potter, *et al*., 2017, pp. 36-37, 611-616).
[101] Te Ao Māori.
[102] Place of higher learning, university.
[103] Knowledge, information, education.
[104] Io-the-parentless-one, one of the names for the supreme deity, Io
[105] Marsden, M., 2003, The woven universe, pp. 60-62.
[106] Ancestor/s.

thesis. The idea of a Māori worldview generalisation is an over simplification of a very complex perceptual and conceptual reality. Because worldview assumptions underpin all systems of language and knowledge development, it is appropriate for Chapter 2 to begin with an introduction to Te Ao Māori. An overview of assumptions, concepts and customary narrative associated with Te Ao Māori provides a general context in which to focus specific attention on one crucial foundation pillar of Te Ao Māori - the expression of kaitiakitanga[107,108] - which is central to this hapū-led endeavour.

Second, an essential characteristic of Te Ao Māori is whakapapa which may be described as the whānau relationships between all things.[109] Whakapapa provides a whānau-based way of seeing the world that is distinctively characteristic of what some Pākehā[110] academics have referred to as 'indigenous' cultures. Chapter 2 opens with an introduction to Te Ao Māori, then follows the whakapapa of the Māori creation narrative involving Ranginui[111] and Papatūānuku[112] as it unfolds into atua and tangata whenua[113]. Recitation of appropriate parts of this creation narrative also provides an opportunity to focus attention on the atua experiences of our tūpuna as they: (i) settled in the Kāpiti Coast and Horowhenua region; and (ii) adapted to the arrival of Pākehā in the 18th Century, and their expanding settlement, particularly following the signing of the Te Tiriti o Waitangi[114] in 1840.

Unfortunately, as a result of colonisation much of the detailed oral history of our tūpuna has been lost and with it the associated kaupapa and tikanga.[115] The loss of oral history,

[107] Guardianship, stewardship.
[108] Marsden, 2003, pp. 54-72.
[109] Mikaere, A., 2014, Te Tiriti o Waitangi me te Taiao, p. 1 & 6; Potter, *et al.,* 2017, p. 43.
[110] Non-Māori, European.
[111] Sky father.
[112] Earth mother.
[113] People of the land, indigenous people.
[114] Treaty of Waitangi.
[115] Potter, *et al.,* 2017, pp. 71-78.

kaupapa and tikanga is inextricably associated with the loss of land and its associated atua domains. Kaupapa and tikanga linked our tūpuna with daily observations of the rhythm of the domains of various atua.[116,117] As noted by Māori Marsden, these observations of atua as well as whānau experiences laid the foundation for the corpus of Māori knowledge that forms the basis of mātauranga Māori.[118] As repeatedly noted in this doctoral thesis, in Te Ao Māori, ecological and whānau, hapū and iwi wellbeing are inextricably interrelated. Previous research has emphasised that the wellbeing of inland waterways and people with Māori communities are intricately linked.[119] Observations drawn from daily experiences influenced how our tūpuna related to and lived in, what we today call the natural world.[120] This point is important because this ecosystem restoration project is fundamentally about tūpuna, iwi, hapū, whānau and wairua[121] experiences in the natural world.

To understand the rationale behind the methods that contributed to this joint Māori–western science ecosystem restoration project, acquaintance with the discourse, genealogical and cosmological narrative and oral history described above is essential.

Third, the outline of whakapapa covered in Chapter 2 eventually focuses attention on the journeys of our tūpuna from Hawaiiki to this island they named Te Ika a Māui[122]. From the first arrival of the Tainui waka[123] to the southern migrations of Te Rauparaha, these narratives draw attention to key events that influenced our tūpuna to settle in the Kāpiti Coast and Horowhenua region. The need for restoration activities to address the

[116] Natural world, ecosystems.
[117] Mikaere, A., 2014, p. 1.
[118] A Māori theory of causality in the natural world.
[119] Fox, C., *et al.*, 2017, "The river is us; the river is in our veins": re-defining river restoration in three indigenous communities, p. 530; Henwood, W., & Henwood, R., 2011, Mana whenua kaitiakitanga in action: Restoring the mauri of Lake Omapere, p. 220; Smith, S., 2007, p. 6 & 26.
[120] Mikaere, A., 2014, p. 1.
[121] Spirit, soul.
[122] Also known in English now as the North Island of New Zealand.
[123] Canoe.

current ecological state of Lake Waiorongomai and the associated decline in wellbeing of iwi, hapū, whānau and Te Ao Māori[124] can only be adequately understood with the aid of an outline of the history of Pākehā settlement and the introduction of new worldviews during the last 170 years. In the years following the signing of Te Tiriti o Waitangi, the Kāpiti Coast and Horowhenua region was rapidly settled by Pākehā.

These themes are unfolded in Chapter 2 essentially in the order in which they are described above: (i) an introduction to Te Ao Māori (section 2.1); (ii) ancestral journeys relevant to this doctoral research associated with settlement in the Kāpiti Coast and Horowhenua region (section 2.2); and (iii) Pākehā arrival and influence on the cultural landscapes of the Kāpiti Coast and Horowhenua region (section 2.3). This history provides an important Māori cultural context that is needed to understand the cultural landscape of Ōtaki and Lake Waiorongomai described in Chapter 3.

2.1 An introduction to Te Ao Māori

For the sake of secondary audiences[125] of this doctoral thesis, it is important to provide a brief explanation of key aspects of Te Ao Māori that directly relate to the planning and ecological restoration aspirations of local whānau and hapū. In particular, it is important to again note that the English academic term 'worldview' must be interpreted as implying the co-existence of 'many worldviews' whenever it is used to describe all things Māori (i.e. Te Ao Māori). While Te Ao Māori generalisations are made in this thesis, variations on narratives exist within iwi and hapū.[126] To support the goal of introducing Te Ao Māori, this Chapter specifically cites written and oral

[124] Winiata, W., 1979, Whakatupuranga Rua Mano-Generation 2000: An experiment in tribal development, pp. 1-9.
[125] The secondary audience of this doctoral thesis includes non-Māori academics and professionals.
[126] Marsden, 2003, pp. 2-3; Kingi, T., 2002, Māori worldview and the environment: What are we talking about? p. 5.

literature from a range of sources that supports the mātauranga of the whānau and hapū of Waiorongomai.[127]

While extensive written literature exists about Te Ao Māori, very little of this information specifically represents the mātauranga of the whānau and hapū of Waiorongomai. In particular, reference here is made to early settler writers[128] whose contribution to the current state of written literature is acknowledged but not cited in this research. This selective use of literary sources is consistent with emerging kaupapa-Māori thinking[129] which suggests that it is appropriate for indigenous researchers to write about their own people, culture, views and values. Thus, the following introduction to Te Ao Māori reflects the whānau, hapū and iwi contexts, to which the author is (inextricably) tied, through whakapapa and through involvement in restoration activities.

2.1.1 Māori perspective about the beginning of our universe

The following narrative on the esoteric creation of the universe and all things within it is based upon the Io mātauranga of Tainui as described by Pei Te Hurinui Jones.[130] At first there was nothing, in Te Kore – the formless void – where eight spans of time evolved to produce Io, the supreme deity, and the start of our universe. However, some elaboration on the evolution of Io seems appropriate to help understand this distinctly Māori creation narrative. Two elements, one male named Hani and one

[127] As demed appropriate by kaumātua Te Waari Carkeek and Rupene Waaka.
[128] For example: Grey, G., 1854, reprinted 1855, 1956, 1961, 1965, and 1995, Polynesian mythology and Māori Legends; Best, E., 1924, reprinted 1976, 1995, 2005; Manning, F. (Ed.), 1930, Old New Zealand – A tale of the good old times; Cowan, J., 1934 reprinted 1995, Tales of the Maori bush; Polack, J., 1976, Manners and customs of the New Zealanders; with notes corroborative of their habits, usages etc. and remarks to intending emigrants, with numerous cuts drawn on wood.
[129] Durie, M., 1995b, Tino Rangatiratanga: Self-determination; Durie, M., 1998, Te Mana, Te Kawanatanga: The politics of Māori self-determination; Marsden, 2003, p. 22; Mead, H., 2003, Tikanga Māori: Living by Māori Values, pp. xi, 25-26; Pihama, L, *et al.*, 2002, Creating methodological space: A literature review of kaupapa Māori research; Smith, G., 1997, The development of kaupapa Māori: theory and praxis; Smith, L., 1999, Decolonising methodologies; Research and indigenous people.
[130] Hurinui, P., 2010, King Pōtatau, pp. 238-266.

female named Puna searched longingly for each other in a desire to meet. As they merged to form Io, a deistic conception of the creation of the world began. On the bosom of Papatūānuku (earth mother) they propagated firstly all things that live in the sea, then the rivers and then land. These things were:

> so implanted on the earth as food to sustain the *mauriora* or the life principle, by which the male and female of all species are nurtured, obtain life-giving blood, and so flourish and take form. By the *mauriora* the female gives birth, suckles her young and gives them sustenance. Indeed, all living things were thus nurtured on earth and had their being, and the means of sustenance for man - both men and women - who came into the world later, was thus provided.[131]

Pei Te Hurinui Jones continues the narrative that Ranginui (the sky father) and Papatūānuku were not together at this time and were both a-sexual in a period of time known as Ka Mārama te Ao (the world is aglow). Hani and Puna disturbed the heavenly slumbers of Ranginui and Papatūānuku and as a consequence they both Ranginui and Papatūānuku (separately) gave birth to a number of children.[132] Then Ranginui came down to embrace Papatūānuku. Many children were also born from this close union, too many for Pei Te Hurinui Jones to depict in his narrative.

[131]Ibid, p. 239.
[132] Hurinui, P., 2010, King Pōtatau, pp. 241-244.

Table 2.1.1 Significant atua documented by Pei Te Hurinui Jones

Rongo	To whom was given the power over cultivated food plants of the earth. In his godhood he became the deity of Sound, and the god of Peace.
Tānemahuta	To whom was given dominion over birds and the trees of the forests.
Haumiatikitiki	To whom was given power over all uncultivated food plants of the earth.
Tāwhirimatea	To whom was given power over winds, storms and rain.
Tangaroa	To whom was given the power over the fish in the ocean and fresh waters, and also all reptiles on land.
Ruaimoko	To whom was given power over earthquakes, volcanoes and all thermal activities on land.
Tūmatauenga	To whom was given power over warfare and over mankind.
Kahukura	Who is also called Uenuku, the rainbow, which is visible to human eyes. In his godhood he discloses hidden things to Man. He is also protector of mankind.

(*Source: Hurinui, P., 2010, pp. 243-244*)

Māori Marsden[133] describes the genealogy of Māori to these atua in Te Ahukaramū Charles Royal's[134] edited book *The Woven Universe.*[135] As Ranginui and Papatūānuku remained embraced, their children were stuck in darkness. This situation resulted in discord and all of the children (except Tāwhirimātea) conspired in rebellion to wrench their parents apart so that light could come into the world. Tānemahuta was successful in his plans as he placed his hands on Papatūānuku and thrust his feet up against Ranginui. This is how, according to Māori narrative, Papatūānuku became our ancestral earth mother and Ranginui our sky father. Following this important achievement, Tānemahuta reserved the forest and birds as his domain and then proceeded to create human life. Tānemahuta sculptured the first human (a woman), from the clay of Papatūānuku and thus her name was "Hineahuone (the maid that emerged out of the dust)."[136] With the aid of a hongi[137], Tānemahuta then infused his breath and mauri[138] into Hineahuone and she came to life.[139]

[133] Tai Tokerau – the northern tide – peoples of the north.
[134] Iwi member Ngāti Raukawa ki te Tonga, Ngāti Kikopiri, Ngāti Tamaterā and Ngā Puhi.
[135] Marsden, 2003, pp. 17-18.
[136] Ibid, p. 18.
[137] Press noses in greeting.
[138] Life force.
[139] Mitchell, S., & Mitchell, J., 2007, Te Whakaminenga o Kāpiti, p.32.

Based on this genealogy, as Māori we have a vested interest in the care of family members within what western scientists refer to generally as 'the natural world'. This idea of a natural (i.e. not of human influence) world is difficult to find in a Te Ao Māori perception of reality.[140] Māori see themselves as part of nature.[141] This point is elaborated by Te Ahukaramū Charles Royal and is worthy of further consideration. His Te Ao Māori conception of Te Ao Mārama is central to understanding whakapapa or genealogical interrelationships.

> Te Ao Mārama (the unification of the human person with the world) represents the traditional Māori worldview. The world came into being following the separation of Ranginui (sky father) and Papatūānuku (earth mother) and that world is entitled Te Ao Mārama… The outcome of the Te Ao Marama tradition is the unification of the world (particularly the land) with the human person. Traditionally, the chief process by which a Māori grouping formulated its relationship concerning the environment was through whakapapa (genealogical links)… Fundamentally, the relationship between a Māori grouping and their environment commences with a direct genealogical link to land… This view is central to the Māori perception of the world: humans are intimately connected to the world and not separate from it.[142]

[140] A. Cole, personal communication, 11 February 2016. Anthony Cole hapū member Ngāti Raukawa ki te Tonga, Ngāti Koroki.
[141] T. Carkeek, personal communication, 7 November 2016.
[142] T. Royal, 1998. Cited in Kingi, 2002, p. 6.

Te Ahukaramū Charles Royal expands further on Te Ao Mārama outlining how all things within the natural world are related, and that people understand how to act within these relationships.[143] This distinction between the Māori conception of Te Ao Mārama and the western scientific assumption of a natural world is important for another reason. Royal continues "although science is another way of understanding the natural world, the traditional principle of interconnectedness is still important and meaningful to Māori".[144] This distinction is an important means of understanding the worldview orientation brokered in this research and the concept of kaitiakitanga and guardianship, described in greater detail in Chapter 3. While the Lake Waiorongomai restoration project incorporates western scientific ecological monitoring dimensions, these should not be considered as compromising or diminishing the centrality of mātauranga, kaupapa and tikanga. Examples of how Te Ao Māori and Pākehā knowledge traditions co-existed in this project are discussed in Chapter 4.

Nigel Te Hiko[145] and Phyllis Tahere[146] discuss the importance of whakapapa and kaupapa as foundations to Te Ao Māori.[147] These authors agree with Pakake Winiata[148] who states that pūrākau[149], karakia[150], mōteatea[151] and whakataukī[152] describe Te Ao Māori, which also form a set of kaupapa, and from these kaupapa tikanga are developed (Figure 2.1.1).[153] "Tikanga are the actions, methods, processes and policies etc that are

[143] Te Ara – the Encyclopedia of New Zealand, 2010, Te taiao Māori and the natural world, p. 8.
[144] Ibid.
[145] Waikato-Tainui.
[146] Ngāti Raukawa ki te Kaokaoroa a Pātetere.
[147] Te Hiko, N., & Tahere, P., 2015, Ōrakau – Raukawa traditional association and mana o te whenua, p. 118.
[148] Iwi member Ngāti Raukawa ki te Tonga, Ngāti Pareraukawa.
[149] Narratives.
[150] Incantations and prayers.
[151] Songs.
[152] Proverbs.
[153] Te Hiko & Tahere, 2015, p. 118.

aligned and consistent with the foundation kaupapa."[154] Māori arts and language in general are forms of articulating Te Ao Māori.[155]A set of key kaupapa and tikanga observed in the Lake Waiorongomai restoration project derived from the whānau and hapū worldview are expressed in Chapter 5.

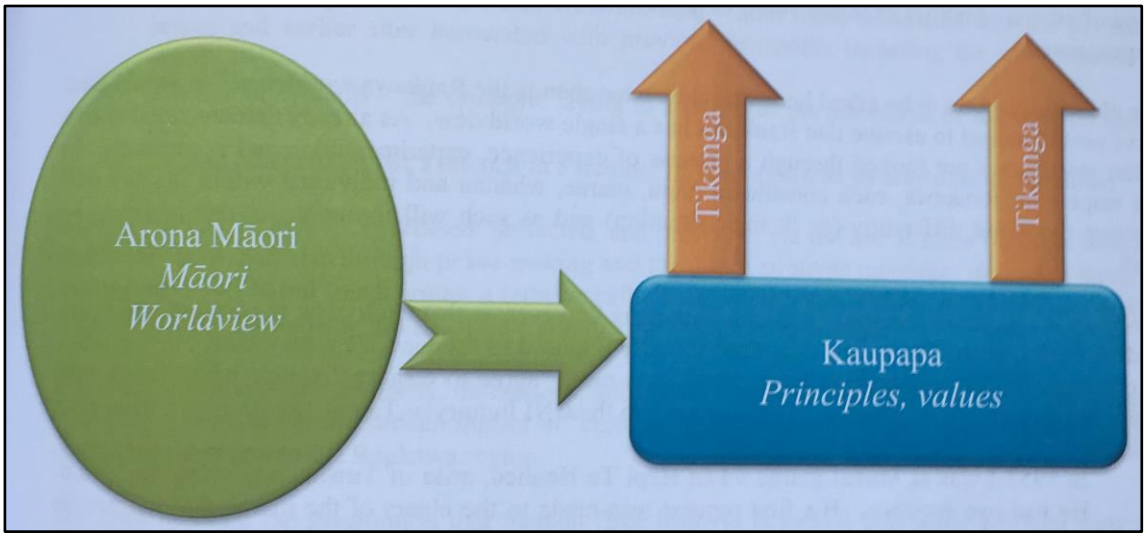

Figure 2.1.1 The expression of Te Ao Māori, kaupapa and tikanga *(Source: Te Hiko, N., & Tahere, P., 2015, p. 188)*

The English term 'natural world' encapsulates a model of complexity that does not easily reconcile with Māori conceptions of reality, which is better expressed in te reo Māori. The term 'Te Ao Mārama' encapsulates a model of complexity that unifies humans with the world.[156] What might be referred to as a classical western science worldview assumes that reality may be most appropriately thought of as composed of fundamental building blocks (e.g. matter) that give rise to discrete levels of material and non-material (e.g. social) organisation. Māori Marsden and the findings of the New Physicists in the 1920s fundamentally challenged this classical western scientific

[154] Winiata, P., 2003, Guiding principles/Kaupapa of Te Wānanga-o-Raukawa: A discussion paper, cited in Te Hiko & Tahere, 2015, p. 118.
[155] T. Carkeek, personal communication, 7 November 2016.
[156] A. Cole, personal communication, 11 February 2016.

conceptualisation of reality.[157] This provides evidence that the development of western scientific theory is moving towards the mātauranga of our tūpuna. The model of Māori Marsden describes the existence and interrelationship between three fundamental realms: (i) Tua-uri (the realm of mauri), (ii) Te Aro-nui (the realm perceived by human senses), and (iii) Te Ao Tua-ātea (the spiritual realm of Io Matua Kore that is beyond the time-space continuum).[158]

In the realm of Tua-uri, mauri is the life force that binds all things together. Māori Marsden describes 'mauri' as "the elemental essence imparted by wairua to give uniqueness and being to each individual object."[159] It is the element imminent in all things that knits and bonds them together. Out of this double function of mauri is created unity within diversity, which is the basic building block of the universe around which *hihiri* – elemental energy – coalesces and with which the universe merges to generate and bring the cosmic[160] process into the actuality of existent being.[161] Māori Marsden suggests that the very nature of mauri provides hope that accumulated effects of environmental damage may be reversed. This point is evident in the following statement:

> Mauri as life-force is the energy within creation which impels the cosmic process onwards towards fulfilment. The processes within the physical universe are therefore 'pro-life' and the law of self-regeneration latent within creation will, if not interfered

[157] Marsden, 2003, pp. 28-31.
[158] Ibid, pp. 60-62.
[159] Ibid, p. 60.
[160] The word 'cosmic' has been added to assist interpretation of this passage and is consistent with the thinking of Māori Marsden in other parts of the book chapter from which this reference is taken. Marsden, 2003.
[161] Ibid, p. 47.

> with, tend towards healing and harmonising the eco-systems and biological functions within Mother Earth.[162]

Our tūpuna did not separate the spiritual realm (Te Ao Tua-ātea) from the realm of human sense perception (Te Aro-nui or what western scientists might refer to as the 'physical world'). In Te Ao Māori these two realms are inextricably related. Further, the realm of wairua (Te Ao Tua-ātea) is ultimate reality which cannot be understood or approached without an understanding of the differences between tapū[163] and noa.[164] Māori Marsden notes that Tua-uri, Te Aro-nui and Te Ao Tua-ātea may be thought of as the distinctive triple worldview of Māori. In other words, our tūpuna appear to have understood that their holistic conception of reality was a product of their perception of reality.[165]

2.2 Ancestral journeys and oral history relevant to this doctoral research endeavour

This sub-section moves beyond the whakapapa of the Māori creation narrative involving Ranginui and Papatūānuku and focuses attention on the migratory experiences of our tūpuna. From the arrival of the Tainui Waka in Kāwhia to the southern migration of Te Rauparaha, these narratives draw attention to key events that influenced our tūpuna to settle in the Kāpiti Coast and Horowhenua region. The oral histories recited here shed important light on: (i) the naming and cultural significance of Lake Waiorongomai to local whānau, hapū and iwi; and (ii) the emergence of a distinctive Māori cultural landscape in the Kāpiti Coast and Horowhenua region.

[162] Ibid, p. 49.
[163] Sacred.
[164] Noa in this context means to be without sacred restrictions.
[165] A. Cole, personal communication, 11 February 2016.

Māori oral traditions provide accounts of waka journeys from Hawaiki that link Māori origins to the Polynesian islands. Sir Peter Buck critically analysed a range of factors to draw similarities between Māori language, cultural narratives, traditions, physical attributes and genealogies to those of islands such as Hawai'i, Tahiti, Rarotonga, Samoa, Easter Island and other islands in Polynesia.[166] Buck noted that our tūpuna voyaged regularly throughout the Pacific ocean and probably travelled as far afield as Melanesia, Micronesia, Asia and South America. Wakahourua (double-hulled sailing vessels) were used on these long voyages and carried our tūpuna to the shores of Aotearoa along with the resources they needed to endure the journey and settle new lands.[167,168]

According to respected elder Rore Eruera, one of the last remaining Tainui descendants to be schooled in early Whare Wānanga, Māui was the first to discover New Zealand.[169] Rore Eruera recounts the story of Māui fishing this land out of the sea to Leslie Kelly, who in response noted that many consider this 'myth' to be a 'folk-tale'. Rore Eruera went on to explain that Māori systematically use metaphorical embellishment, whereas Europeans were prone to seek literal interpretation of such oral traditions. According to Rore Eruera, the Māui narrative (described above) should not be taken as an attempt to imply that "Maui really fished up New Zealand. It means he discovered it".[170] Other iwi (such as Ngāti Awa in the Bay of Plenty) use the Māui narrative to as the first person to discover these islands.[171]

Māui Pōtiki or Māui-tikitiki-a-Taranga (commonly referred to as Māui) was a demi-god with magical abilities, cheekiness and great strength whose legendary exploits are

[166] Buck, P., 1954, Vikings of the sunrise.
[167] Ibid, pp. 40-41.
[168] King, M., 2003, The penguin history of New Zealand, pp. 32-33.
[169] Kelly, L., 1949, Tainui – The story of Hoturoa and his descendants, p. 8.
[170] Ibid.
[171] A. Te Aomarere, personal communication, 7 November 2016.

widespread throughout the Pacific.[172] Matene Te Whiwhi's 1852 manuscript begins with whakapapa spanning nineteen generations from Runuku to Hine and Taranga, the parents of Māui and his siblings: "ka moe a Hine ia Taranga Ko Maui mua Ko Maui roto Ko Maui taha Ko Maui pae Ko Maui Tikitiki o Taranga.[sic]"[173] Māui was a well-known ancestor of Polynesians: Māori; Hawaiians; Easter Islanders; and all the islands in between, and some beyond.[174] Some of the legends involve Māui shape shifting, securing fire, snaring the sun, attempting to defeat death for mankind and fishing up numerous islands. One narrative described Māui stowing away on his brothers' waka for an incredible fishing journey where he is said to have caught and exposed the lands of New Zealand. Using a magical hook, fashioned from his grandmother's jaw bone adorned with dog hair and a beautiful mother-of-pearl, Māui smeared the hook with his own blood as bait.[175] As legend depicts it, the shape of the North Island of New Zealand is similar to a fish, and is named Te Ika a Māui (The fish of Māui).[176] Te Upoko o te Ika (The head of the fish) lies at Wellington.[177] Te Waka a Māui (The canoe of Māui) is known as the South Island of New Zealand.[178] As Maui Pomare and James Cowan put it, this 'nature-myth' along with other narratives were early examples of "Māori geographer's tendency to preserve his scientific conclusions in the guise of allegory or fable is contained in the story."[179] The earliest written account that stated

[172] Grey, 1995, pp. 10-35.
[173] Te Whiwhi manuscripts, 1852, pp. 4-6. Cited in Loader, A., 2013, Tau mai e Kāpiti te whare wānanga o ia, o te nui, o te wehi, o te toa: Reclaiming early Raukawa-Toarangatira writing from Ōtaki, pp. 115-116. The author Dr Arini Loader is a whānau member Ngāti Raukawa, Ngāti Maiotaki, Te Whānau-a-Apanui, Ngāti Whakaue.
[174] T. Carkeek, personal communication, 7 November 2016.
[175] Grey, 1995, pp. 23-37; Rikihana-Hyland, Q., 2010, Illustrated Māori myths and legends, pp. 28-35.
[176] Rikihana-Hyland, 2010, p. 35. The author Queenie Rikihana-Hyland whānau member Ngāti Raukawa, Ngāti Koroki, Te Āti Awa ki Whakarongotai.
[177] Ibid.
[178] Pomare, M., & Cowan, J., 1987, Legends of the Māori, p. 14.
[179] Ibid, p. 42.

that Māui was the first explorer to discover New Zealand was recorded by Reverend Samuel Marsden in 1819.[180]

Leslie Kelly and Michael King in their separate publications both describe the existence of scholarly debate on a popular understanding that Kupe, who is known as a great voyager amongst Pacific peoples, travelled to these shores and was in fact the first to discover these islands.[181,182] Pei Te Hurinui Jones supports the theory that Kupe was the first[183] as does Sir Peter Buck, who also states that Kupe was a famous navigator who travelled great distances and was known by many across the islands of the Pacific.[184] By contrast, Michael King argues that the Kupe discovery explanation was not a Māori oral tradition but was introduced by early Pākehā writers such as David Simmons and Stephenson Smith, who were also responsible for introducing 'Aotearoa' as the Māori name for all the islands that make up New Zealand.[185] Te Aue Davis, a renowned kuia, weaver and repository of mātauranga Māori, compiled a publication for the New Zealand Geographic Board to ensure the Māori place names of New Zealand were properly recorded.[186] The section dedicated to Kupe noted that there were many variations and regional differences, however she reported that the 'Māori tribal authorities' reject the idea that Kupe was a myth, and state clearly that he was a "historical, exploring ancestor" of North Island iwi.[187]

[180] Letters and journals of Samuel Marsden, p. 196. Cited in Reed, A., 1963, Treasury of Māori folklore, p. 139.
[181] Te Ika a Maui, Te Waipounamu, Te Whare Kauri now commonly known as Aotearoa and New Zealand.
[182] Kelly, 1949, pp. 6-8; King, M., 2003, p. 42.
[183] Jones, P., & Biggs, B., 1995, Nga Iwi o Tainui – The traditional history of the Tainui people – Nga Kōrero tuku iho a nga tūpuna, p. 12.
[184] Buck, 1954, p. 277.
[185] King, M., 2003, pp. 38-47.
[186] Davis, T., 1990, He korero pūrākau mo ngātaunahanahatanga a ngā tūpuna: Place names of the ancestors: A Māori oral history atlas, p. 14.
[187] Ibid.

With time, and through the use of educational resources such as the School Journals, Māori eventually also came to believe the Kupe discovery theory and that the use of the name 'Aotearoa' were products of their own oral history.[188] According to King, thinking of this kind is difficult to defend on linguistic grounds.[189] For example, prior to this name, the North Island was known by Māori as Te Ika a Māui - a reference mentioned earlier to the metaphorical Māui fishing narrative. The South Island, too, had a few names in addition to Te Waka a Māui mentioned above:

> Te Waka-a-Aorangi, the canoe of Aoraki (the ancestor frozen in stone and ice as the highest peak in the Southern Alps) and as Te Wahi Pounamu (the place of greenstone) and Te Wai Pounamu. Stewart Island to the south was Rakiura.[190]

Narratives handed down by the whānau and hapū of Waiorongomai attribute the discovery of these islands, now known collectively as Aotearoa to both Maui and Kupe, "Maui was the demi-god and Kupe the physical person who navigated around the North Island naming significant sites. Our iwi whakapapa to Kupe. It is important to know your whakapapa. Kupe had dominance in his time."[191]

The ancestors of Ngāti Toa Rangatira and Ngāti Raukawa travelled to these islands over the Pacific ocean on the Tainui waka led by Hoturoa. The following is a brief account, extracted from two Tainui historical resources written by Leslie Kelly[192,193] and Pei Te Hurinui Jones, of the Tainui waka journey from Hawaiki.[194]

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[188] King, M., 2003, p. 41.
[189] Ibid, pp. 38-47.
[190] Ibid, p. 41.
[191] T. Carkeek, personal communication, 7 November 2016.
[192] Kelly, 1949.
[193] These Leslie Kelly accounts were translated into English by Bruce Biggs.
[194] Jones & Biggs, 1995.

Hoturoa and his people left Hawaiiki after battles over depleting resources. Beginning their preparation with karakia and rituals, the crew prepared mentally, physically and spiritually for the long voyage. The waka was carved from a tree that had been planted upon the foetus of a still-born baby named Tainui. Rakataura (also known as Rakaiuru) was nominated to build the waka. Due to his not reciting the correct karakia and paying respect to the atua Tānemahuta, the tree was found standing again the day after felling. Rakataura then recited the correct karakia and the expert carvers were able to continue their mahi[195] under tapu[196] conditions. The crew named in Leslie Kelly's account[197] included the lead tohunga[198], Ngaatoroirangi, in charge of navigation and spiritual protection. The fleet also carried essential resources such as kumara[199] and kiore[200,201] on the journey.[202] The Tainui waka was the last of the fleet to leave Hawaiki and, along with the Te Arawa waka, stopped at Rarotonga before journeying on to Aotearoa. It was in Rarotonga that Tainui lost Ngaatoroirangi to treachery or perhaps from their iwi perspective, the cunning plan of the captain of Te Arawa, Tamatekapua. After considerable disruption to Tainui plans, another navigator and tohunga Riukiuta was appointed. His karakia called upon taniwha[203] to guide their waka the rest of the way.

On approaching Aotearoa, a flock of birds met the waka. The shores of Whanga-parāoa were bright red as it was summer and the pōhutukawa were in full bloom. After a brief stop, the Tainui waka travelled on to Whitianga, then cruised around the Coromandel Peninsula to the Hauraki gulf to land at Tamaki (now also known as Auckland).

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[195] Work, job, labour.
[196] Sacred.
[197] Kelly, 1949, p.40.
[198] Priest, spiritual expert.
[199] Sweet potato.
[200] Rat.
[201] " 'Te Pou o Hawaiiki' was Te Rauparaha's name for the rat." A. Te Aomarere, personal communication, 7 November 2016.
[202] "Kumara were obtained from South America. The kiore were a staple food of Hawaiki." T. Carkeek, personal communication, 7 November, 2016.
[203] Water monster.

Crossing over to the Manukau Harbour, they then ventured along the west coast until they reached the shores of Kāwhia Harbour (Figure 2.2.1).[204] The Tainui people remained at Kāwhia for a long period and the waka was brought ashore to a resting place that is marked there to this day. Descendants of Hoturoa[205] eventually departed Kāwhia and the surrounding Waikato region and migrated south. They also took up residency in the Kāpiti Coast and later Horowhenua region and beyond where they asserted mana whenua. This historic journey is a narrative that weaves together elements of the physical world with the unseen spiritual domain. As such, it can be likened to the Lake Waiorongomai restoration journey described in this thesis. Like most travels, the southern migrations of Tainui descendants and Lake Waiorongomai restoration project both involved the occasional bump along the way!

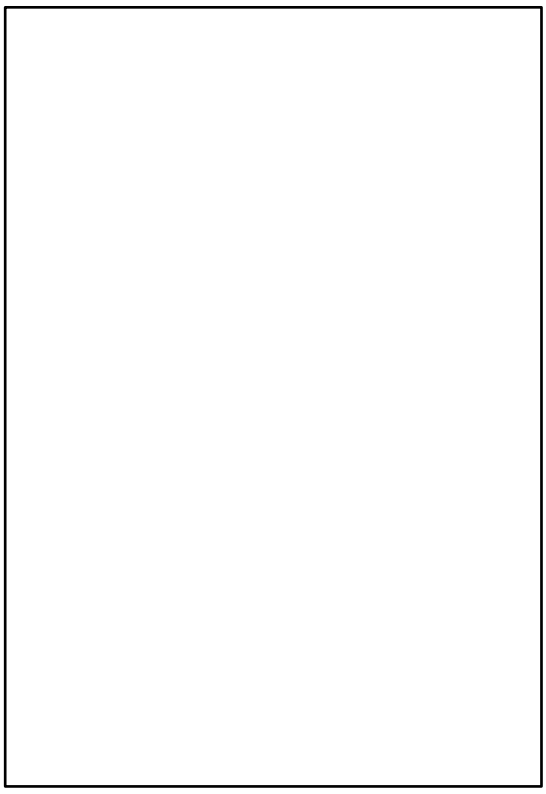

Figure 2.2.1 Tainui waka voyages on arrival in New Zealand. *(Source: Jones, P. & Biggs, B., 1995, p. 10.)*

[204] Jones & Biggs, 1995, pp. 8, 16-50.
[205] Ngāti Toa Rangatira and Ngāti Raukawa.

Key events associated with the southern migrations of Ngāti Toa Rangatira and Ngāti Raukawa may be described as follows. Te Rauparaha was a famous chief who led Ngāti Toa Rangatira south to the Cook Strait area in 1819-20.[206] His initial war-party visit with Nga-puhi iwi allies (of the North of New Zealand) led to his discovery of the tremendous potential of this southern region. Beginning in 1821, Te Rauparaha led Ngāti Toa Rangatira south to the Taranaki region in the migration named Te Heke Tahutahu Ahi (The Migration of Fire Lighting).[207] This initial southern migration was named following an incident near the Mōkau River, where women were dressed as warriors and rushed about lighting many fires to create the illusion that the party was much larger than it was.[208] The deception worked and the pursuing enemy did not attack. The migrating tribe continued on its journey to the Kāpiti Coast and Horowhenua region, arriving around March 1823.[209] The women of this iwi were provided the opportunity to train in the use of weaponry and some chieftainess' were known to lead war parties into battle.[210] Te Rauparaha and Ngāti Toa Rangatira settled at Ōhau, Ōtaki, Waikanae and Kāpiti Island.[211]

One notable event was the killing of Te Rauparaha's children by Muaūpoko iwi, which resulted in Te Rauparaha gathering allies and seeking revenge. Many battles in this local area included the combined efforts of Ngāti Toarangatira, Te Āti Awa and Ngāti Raukawa warriors.[212] Te Rauparaha was of Ngāti Toa Rangatira descent through his father's (Werawera) lineage, and of Ngāti Raukawa descent through his mother's

[206] Museum of New Zealand: Te Papa Tongarewa Exhibition, June 2014-2016, Whiti Te Rā! The story of Ngāti Toa Rangatira.
[207] Ibid.
[208] Collins, H., 2010, Ka mate ka ora!: The spirit of Te Rauparaha, p. 52.
[209] Simcox, F., 1952, Ōtaki: The town and district, p.20.
[210] A. Te Aomarere, personal communication, 7 November 2016.
[211] Simcox, 1952, p.20.
[212] Later known as the ART Confederation (Te Āti Awa ki Whakarongotai, Ngāti Raukawa ki te Tonga, Toa Rangatira).

(Parekōhatu) lineage.[213,214] Later Te Rauparaha would call for his Ngāti Raukawa kin to aid in securing the Kāpiti Coast and Horowhenua region following threats from the displaced iwi: "Ngai Tara, Ngāti Apa, Rangitāne, Muaūpoko and Ngāti Kahungunu"[215]. Ngāti Raukawa in the Waikato region (surrounding Maungatautari) declined the first invitation to travel south with Te Rauparaha.[216] One of the woman that accompanied Te Rauparaha was his older sister Waitohi who was a distinguished leader and diplomat in her own right.[217] It was only when Waitohi used her influence that a portion of the tribe agreed to migrate south to join Te Rauparaha forces in the Manawatū and Horowhenua.[218] Te Manahi of Ngāti Huia (the people of Te Rauparaha's mother) is quoted, "We came at the desire of Waitohi. Had Rauparaha called, the people would not have assented. It was at the word of Waitohi".[219]

> Waitohi was believed to have the gift of prophecy and Te Rauparaha's eldest brother Nohorua was the tribal tohunga. Te Rauparaha as a teina [junior relative] had many senior cousins to listen and join in his endeavours. Te Rangihaeata [son of Waitohi and nephew to Te Rauparaha] was also a tohunga who warned Te Rauparaha of impending danger.[220]

[213] Collins, 2010, p. 12.
[214] Jones, P., 2010, King Pōtatau: An account of the life of Pōtatau Te Wherowhero the first Māori king, p. 42.
[215] Mitchell & Mitchell, 2007, p. 1.
[216] T. Carkeek, personal communication, 7 November 2016.
[217] Museum of New Zealand: Te Papa Tongarewa Exhibition, June 2014-2016, Whiti Te Rā! The story of Ngāti Toa Rangatira.
[218] Collins, 2010, p. 73.
[219] Māori Land Court Minutes, 1984, Manahi at the Ngakaroro hearing. Cited in Carkeek, 1966, p. 23; also cited in Burns, P., 1980, Te Rauparaha: A new perspective, p.141.
[220] T. Carkeek, personal communication, 7 November 2016.

The portion of Ngāti Raukawa that took up residency in the Kāpiti Coast and Horowhenua region[221] is now known as the iwi of Ngāti Raukawa ki te Tonga, a faction with whakapapa links to those of Ngāti Raukawa that still remain in the ancestral Waikato region. A number of heke (migrations) brought Ngāti Raukawa to this district (e.g. Te Heke Karere, Te Heke Whirinui, Te Heke Kariri-tahi, Te Heke Mairaro)[222] and they were given areas of land by Te Rauparaha[223] where they continue to assert mana whenua today.

Te Āti Awa also joined Ngāti Toa Rangatira forces and occupied this land alongside Ngāti Raukawa. As these three conquering tribes[224] began to settle the Kāpiti Coast and Horowhenua regions, unrest and quarrels over land and resources began amongst the iwi and hapū.[225] Again Waitohi used her influence to suggest that Te Āti Awa move to occupy the Waikanae area and Ngāti Raukawa move north to occupy the area between the Kukutauaki Stream (north of Waikanae) to the Manawatū River.[226] These three iwi have a long standing relationship, which endures today and is locally referred to as the ART (Āti Awa, Raukawa, Toa-Rangatira) Confederation.[227]

After the conquest of Rangitāne and Muaūpoko, Ngāti Raukawa ki te Tonga were allocated their former lands from Rangitikei River to Kukutauaki Stream under the agreement of Te Rauparaha.[228] An exemption was made for Muaūpoko to occupy a small strip of land due to the protection and sanctuary provided by the Ngāti Raukawa

[221] As well as the Manawatū region.
[222] Collins, 2010, pp. 72, 79, 85, 86.
[223] Noted by Ngāti Raukawa in a 1880 petition to Parliament, recorded in Archives New Zealand, MA 13/16. Cited in Hearn, T., 2010, The Waitangi Tribunal Porirua ki Manawatū Inquiry District: A technical research scoping report, pp. 38-39.
[224] Ngāti Toarangatira, Ngāti Raukawa and Te Āti Awa ki Whakarongotai.
[225] Simcox, 1952, p. 21.
[226] Carkeek, 1966, p. 24.
[227] 'A' standing for 'Āti Awa' in Te Āti Awa ki Whakarongotai, 'R' standing for 'Raukawa' in Ngāti Raukawa and 'T' standing for 'Toa' in Ngāti Toa Rangatira.
[228] Adkin, G., 1948, Horowhenua: its Māori place-names and their topographic and historical background, p. 252.

chief, Te Whatanui.[229] Each Ngāti Raukawa hapū were allotted defined areas (Figure 2.2.2), with Te Rauparaha retaining "some sort of overlordship over the whole".[230]

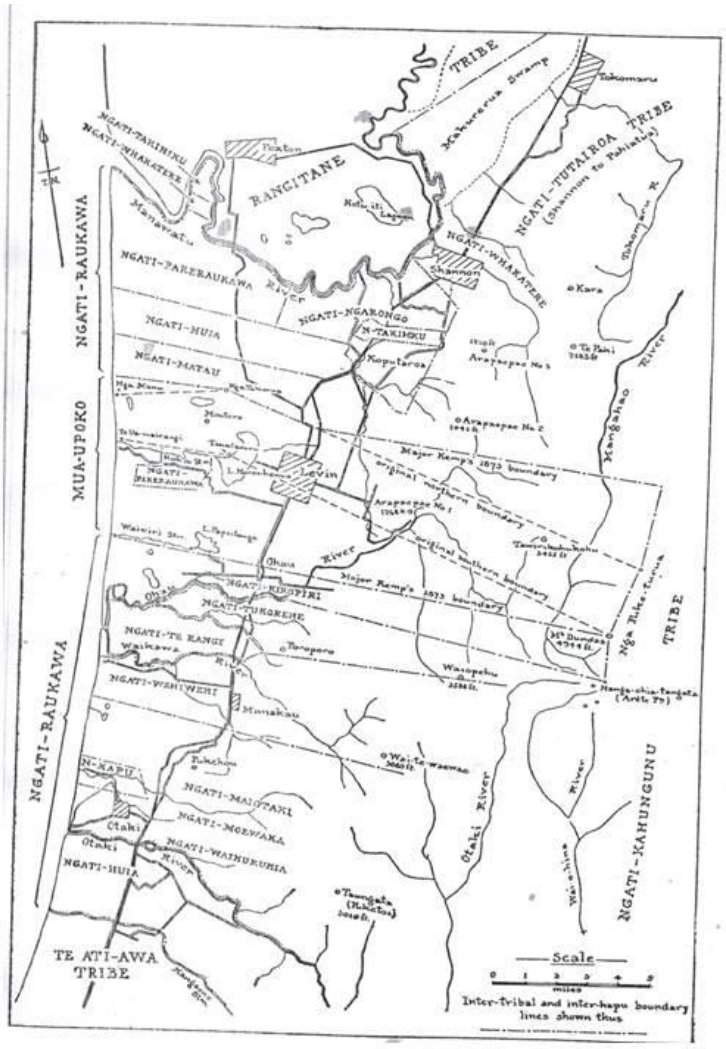

Figure 2.2.2 Ngāti Raukawa hapū rohe. *(Source: Adkin, G., 1948, p. 128.)*

The settlement of the Horowhenua associated with the southern migration of our iwi under the capable leadership of Te Rauparaha, draws to a close the journeys of our tūpuna to their new home and isolation from Pākehā influence. This important phase in our history is covered in the next sub-section.

[229] Ibid, pp. 252-254.
[230] Ibid, p. 126.

2.3 Pākehā arrive to settle in Kāpiti-Horowhenua

> Only those who saw the country in its virgin state can realise the prodigality of nature of the beauty that has for ever passed away, leaving in the settled districts not a trace behind. Mountains and plains alike were clothed with magnificent forest, abounding with bellbirds, pigeons and tuis, and vocal at sunrise with their music, while the beautiful lagoons swarmed with native ducks. The changes which have followed settlement on this island must have been seen to be credited. Since 1855 the woods have gone, and with them the teeming and beautiful bird and insect life to which they gave shelter.[231]

The need for ecological/cultural restoration activities to address the current ecological state of Lake Waiorongomai and associated decline in wellbeing of whānau, hapū, iwi, and Te Ao Māori[232] can only be adequately understood with the aid of an outline of the history of Pākehā settlement and the introduction of new worldviews during the last 170 years. The term 'māori' was used by our tūpuna to describe ancient things or things that are ordinary, whereas the term 'pākehā' was used for pale skinned people according to Anne Salmond.[233] This sub-section aims to give an overview of key aspects of this history. It draws from the work of scholars, oral historians and recent researchers.

Initial contact between Māori and explorers such as Abel Tasman (1642), James Cook (1769) and Jean de Surville (1769) often resulted in hostilities with men killed on either

[231] Ibid.
[232] Winiata, 1979, pp. 1-9.
[233] Salmond, A., 1997, Between two worlds: Early exchanges between Māori and Europeans, p. 21.

or both sides.[234] However, during the early stages of Pākehā settlement James Belich suggests that violence of this kind decreased due to an increase in trading activities. Māori desired what the Pākehā had and vice versa. Trading activities changed the dynamics of Māori-Pākehā contact and, as a consequence, between 1800 and 1840 Māori society also dramatically changed. For example, Māori began to use Pākehā tools and techniques for commerce and agriculture while doing their best to ensure that technology and economic adaptations were "organised and distributed for Māori ends in a Māori way".[235] Trading activities initiated other changes as well. Today, many Māori who live in the Kāpiti Coast and Horowhenua regions including the Waiorongomai whānau and hapū, have European whakapapa that can be traced back to early Pākehā traders and settlers.

According to James Belich (1988), Pākehā settlers arrived to find Māori living well adjusted from their tropical islands to these temperate lands:

> The Maori[236] were a tribal people, with a subsistence economy based on the cultivation of root-crops, supplemented by fishing, gathering, and bird-hunting. They lived a harsh life, without metal tools or a written language. But this did not mean that their society was simple and primitive, or rigid and unchanging. Organized around a well-developed belief system, a rich oral and artistic culture, and the principle of kinship, traced through descent, Maori society was varied, complicated, and robust. It was also 'flexible, resilient, and adaptable' – not ill-equipped, in

[234] Ibid, 1997, pp. 22-27; Belich, J., 1988, The New Zealand Wars, p. 19.
[235] Belich, 1988, p. 8.
[236] In the original text the term used was "Maori's". The "s" has been removed although this is a direct quote, as per the strict instruction of kaumātua Rupene Waaka. There is no 's' in the Māori language and therefore to continue using it on Māori words in this doctoral thesis normalises it. Waaka, R., personal communication, 20 November 2017.

> some respects, to face the biggest environmental change of them all: the advent of Europeans.[237]

During the mid 1820s a growing number of trading, sealing and whaling ships visited New Zealand, and many travelled through the Cook Strait area. Māori in the Kāpiti Coast were receptive to bartering with early Pākehā visitors.[238] Te Rauparaha was strategically positioned to obtain maximum trading benefits from this shipping activity, having obtained mana whenua on both sides of the Cook Strait. Te Rauparaha acquired guns and ammunition by trading processed harakeke[239] from the Kāpiti Coast and Horowhenua region.[240] Ngāti Toa Rangatira began to barter with sailors, offering women, slaves, food, harakeke and toi moko (preserved, tattooed Māori heads)[241] for example, in exchange for liquor and tobacco.[242] By the mid 1830s, eight whaling stations were established on Kāpiti Island, which led to Ngāti Toa Rangatira, Ngāti Raukawa and Te Āti Awa raising pigs for trade with the whalers.[243] Trading from Te Rauparaha and his allies on both sides of Raukawa Moana soon included "food, flax, dried heads, and other goods for guns, gunpowder, tomahawks, fish-hooks, shirts, beads, blankets, rum, tobacco and pipes".[244] At that time, Te Rauparaha was renowned for his battle skills as well as his business proficiencies.[245]

> While they paid him respect, Te Rauparaha had welcomed the Pākehā. He recognized their value, not only as a source of guns,

[237] Belich, 1988, p. 17.
[238] Carkeek, 1966, p. 45.
[239] New Zealand flax scraped using a mussel shell produced muka used for rope, cloth and canvas.
[240] Collins, 2010, pp. 73-74.
[241] A. Te Aomarere, personal communication, 7 November 2016.
[242] Burns, P., 1980, p. 184; Collins, 2010, p. 75.
[243] Collins, 2010, pp. 112-113.
[244] Burns, P., 1980, p. 184.
[245] Carkeek, 1966, p. 45.

> but also of other innovations such as iron tools, horses, and sailing ships.[246]

Unfortunately for Māori, there was another price to pay as early traders also shared disease, and soon epidemics sent the local Māori population into rapid decline.[247] By 1839 influenza had hit the Kāpiti Coast.[248] Apart from trade, another important phase in Pākehā settlement involved the arrival of the Christian missionaries. James Belich argues that Māori synthesised the belief systems of the missionaries into their own knowledge systems rather than allowing the new Biblical worldview to displace all things Māori.[249] Similarly, our tūpuna also absorbed Pākehā technologies and economic activities into their way of life. Māori were clearly intent on the use of adaptation strategies that made it possible for them to maintain their cultural identity.[250]

The quote at the start of this sub-section was written by Thomas Bevan[251] who was born in Wales, travelled to Wellington, New Zealand in October 1840 on a ship named the Lady Nugent.[252] He later wrote his 'Reminiscences of an Old Colonist' in the Ōtaki Historical Society Journal many of which concerned the Kāpiti Coast and Horowhenua region.[253] Thomas Bevan eventually moved from Wellington to settle in Waikawa (just north of Lake Waiorongomai), where he lived out the remainder of his life amongst Māori. The earliest written account of Waikawa by Thomas Bevan is based on his travels by foot with fellow siblings and a Māori guide ("Ropina"[254] of "Ngāti Wehi

[246] Collins, 2010, p. 137.
[247] Ibid, p. 117.
[248] Burns, P., 1980, p. 186.
[249] Belich, 1988, p. 20.
[250] A. Cole, personal communication, 11 February 2016.
[251] Also an ancestor of the author.
[252] Bevan, T., 1982, Reminiscences of an old colonist, p. 82.
[253] Bevan, T., 1982, 1983 and 1984, Reminiscences of an old colonist, Otaki Historical Society Journals, Volume 5, pp. 82-89, Volume 6, pp. 92-96 and Volume 7, pp. 86-91.
[254] Bevan, 1982, p. 83.

Wehi"[255]) in order to meet his father at the mouth of the Waikawa River. This narrative provides a detailed account of a wonderful journey in which he describes the "kindness of all the natives" he meet along the way.[256] He depicted the rich life and beauty of the countryside on his arrival at the Waikawa and was saddened by the decline he had witnessed.

In the same year in which the Bevan family arrived in Wellington the Treaty of Waitangi (Te Tiriti o Waitangi) was written and intended as an agreement between British Crown representatives and a significant portion of prominent Māori Chiefs. In the years following the signing of the Treaty of Waitangi, areas within the Kāpiti, Horowhenua and Manawatū coastline were rapidly settled by Pākehā. Through a series of land laws and policies the Crown dispossessed and disenfranchised Māori, as it privileged the interests of Pākehā settlers.[257] Extensive literature exists that critically analyses the Treaty of Waitangi, its Māori and English versions, and the negotiations surrounding its signing.[258] For example, land was acquired by Pākehā at an increasing rate and the destruction of native flora and fauna accelerated.

Noted Treaty of Waitangi researcher, Dr Claudia Orange, points out that while the British gained sovereignty over New Zealand using the Treaty, Māori lost land and rangatiratanga[259].[260] The New Zealand authorities, having convinced Māori chiefs of the benefits associated with becoming signatories to this memorandum of understanding, failed to honour all aspects of the Treaty agreement. As a consequence

[255] A. Te Aomarere, personal communication, 7 November 2016.
[256] Bevan, 1982, p. 86.
[257] Anderson, R., *et al.*, 2018, Crown action and Māori response, land and politics 1840-1900, p. 809.
[258] For example: Evans, R., 2004, The truth about the Treaty; Morgan, G., & Guthrie, S., 2014, Are we there yet? The future of the Treaty of Waitangi; Orange, C., 1984, The Treaty of Waitangi: a study of its making, interpretation and role in New Zealand history; Orange, C., 1987, The Treaty of Waitangi; Stevenson, M., 2004, The Treaty – Every New Zealander's guide to the Treaty of Waitangi; Wheen, N., & Wayward, J., 2012, Treaty of Waitangi settlements.
[259] Chieftainship, self-determination, sovereignty.
[260] Orange, 1987.

Māori were adversely affected, an outcome that contributed to decline in whānau Māori wellbeing, then and to the present day. As documented by Thomas Bevan, decline in wellbeing was not restricted to local whānau, hapū and iwi.[261] Te whānau a Ranginui rāua ko Papatūānuku[262] also suffered the many injustices of Pākehā desire for land along with legal, religious and economic superiority.[263]

Hirini Matunga[264] commented in his writings that the Treaty of Waitangi was the first official written environmental statement that guaranteed to Māori the undisturbed possession of their lands, resources and possessions of value.[265,266] Prior to the Treaty of Waitangi, Māori chiefs had authority (rangatiratanga) and governed according to their tikanga and iwi protocols.[267] Each iwi regarded itself as a 'sovereign political unit' and had their defined boundaries (although these were often disputed). Iwi and hapū maintained social, cultural and political cohesion mostly because all members descended from a common founding ancestor.[268] Iwi and hapū could also traditionally align with others for strategic reasons or declare independence. However, traditional iwi governance models were undermined in New Zealand law, despite the partnership offered to Māori by the Crown via the Treaty.

Eventually, however, the New Zealand government bowed to mounting evidence of injustice, by establishing the Waitangi Tribunal. The Tribunal is one of the mechanisms used to address the grievances Māori have with the Crown over the injustices caused by

[261] Bevan, 1982, p. 86.
[262] The ecosystem families of Mother Earth.
[263] A. Cole, personal communication, 11 February 2016.
[264] A Māori planner that has worked at local, regional and national government levels wrote a number of publications recommending changes to planning in New Zealalnd based on a Māori perspective. For example: Matunga, H., 1989, Local Government – A Māori perspective; Matunga, H. 1994, Wāhi tapu: Māori sacred sites; Matunga, H., 2002, Foreword; Matunga, H., 2000, Decolonising planning: The Treaty of Waitangi, the environment and a dual planning tradition.
[265] Matunga, 1989, p. 1.
[266] Notably, this nationally significant record has an influence on environmental policy and planning within New Zealand today.
[267] Matunga, 1989, p. 1.
[268] Ibid.

not honouring the principles of the Treaty of Waitangi. Ngāti Raukawa ki te Tonga are negotiating their Treaty Claims[269] at the time of this doctoral research.[270] Māori struggles with British sovereignty, legislation, assimilation, and loss of cultural identities and land are explored in detail by a number of authors.[271]

Unwillingness on the part of Pākehā authorities to honour the terms of Te Tiriti o Waitangi eventually influenced Te Rauparaha. Ngāti Toa Rangatira had been voicing their opposition to Pākehā encroaching on their lands in the Porirua district as early as 1841.[272] On the 23 July 1846 Te Rauparaha was unfairly imprisoned by Crown representative Governor Grey.[273] To this very day, Ngāti Toa Rangatira still consider the that the imprisonment of their rangatira and chief was a kidnapping, based on flimsy evidence and a deliberate strategy to disrupt the power and near monopoly of the Raukawa Moana[274] trade.[275] Te Rauparaha's detention without trial was illegal and he was released at the age of 80 after martial law was lifted in March 1847.[276] "Ngāti Toa Rangatira recent Waitangi Tribunal Settlement Decision with the Crown[277] outlines an apology to Ngāti Toa Rangatira for what wrongs they did."[278]

Following release from prison, Te Rauparaha lived out the last two years of his life in Ōtaki and during this time he dedicated himself to the construction of Rangiātea

[269] Ngāti Raukawa ki te Tonga claims are within the Porirua ki Manawatū Inquiry District Wai 2200. Hearn, 2010.
[270] Waitangi Tribunal Hearings, Porirua ki Manawatū Inquiry District, Ngā Kōrero Tuku Iho Hui, Wai 2200 Claims, held at Tukorehe Marae in Kuku, 23-27 June 2014; Raukawa Marae in Otaki, 17-19 November 2014.
[271] For example: Walker, R., 1990 reprinted 2004, Ka whaiwhai tonu matou - Struggle without end; Hill, R., 2004, State authority, indigenous autonomy Crown-Māori relations in New Zealand/Aotearoa 1900-1950; Mutu, M., 2011, The state of Māori rights; Melbourne, H., 1995, Māori sovereignty: The Māori perspective.
[272] Carkeek, 1966, p. 66.
[273] Ibid.
[274] In English this oceanic body of water is known as the Cook Strait.
[275] Collins, 2010, p. 204; Simcox, 1952, p. 37.
[276] Collins, 2010, p. 230.
[277] Ngāti Toa Rangatira Claims Settlement Act 2014, Public Act 2014 No 17, Date of assent 22 April 2014, reprint as at 20 May 2014, Part 1, section 10, Text of apology. Available www.legislation.govt.nz
[278] T. Carkeek, personal communication, 7 November 2016.

Church.[279] The construction of this Anglican Māori Mission church made possible because of the approval of Te Rauparaha was initiated by Rev. Octavius Hadfield. It was completed four years later by Archdeacon Samuel Williams, due to Hadfield's ill health.[280] Te Rauparaha is credited as having: (i) first thought of building Rangiātea; (ii) influenced the organisation of a work force; and (iii) provided resources for the completion of this project.[281] However, he never saw it completed as he died in 1849. Rangiātea Church was a mixture of Māori and Pākehā architectural design, the exterior was European in appearance while the interior was notably Māori, adorned with intricate kowhaiwhai patterns and tukutuku panels, however carvings were kept to a minimum.[282,283]

> One of Te Rauparaha's great strengths was his ability to accept and adapt to changing circumstances. Adapting to the political and economic vulnerability of his people on his return… He chose to live in Ōtaki among his Ngāti Raukawa relatives, who had not suffered the punishing land loss experienced by Ngāti Toa. Te Rauparaha appreciated aspects of Pākehā society such as technology, the written word and new methods of agriculture. He was interested in learning about Christian beliefs without fully adopting them. He may have seen Christianity as a means to build unity and end damaging inter-tribal conflict.[284]

Avoidance of further conflict may have occupied the thoughts of Te Rauparaha during his final years spent in Ōtaki. As many leaders know, the only problem that is greater

[279] Ibid, p. 232.
[280] Adkin, 1948, p. 331.
[281] King, R., 1997, Rangiātea: Ko ahau te huarahi te pono me te ora, pp. 17, 34.
[282] Simcox, 1952, p. 71.
[283] King, R., 1997, p. 33.
[284] Collins, 2010, pp. 230-231.

than conquest, is the prevention of conquest. The settlement of Porirua, Kāpiti Coast, as well as the Horowhenua and Manawatū regions by Ngāti Toa Rangatira, Te Āti Awa and Ngāti Raukawa had been achieved as a result of much conflict. Te Ahukaramū Charles Royal suggests that the strategic mind of Te Rauparaha, in his closing years, may have seen the Gospel of Peace as a useful means to afford a greater future for his people.[285]

Rangiātea Church became an important historic site to Ngāti Raukawa, but many early sites were painstakingly recorded by George Leslie Adkin. Adkin became interested in Māori antiquities whilst farming near Levin.[286] To satisfy his interest he began to gather information from local iwi members as well as surveys of topography and archaeology,[287] which resulted in his book named '*Horowhenua*'.[288] One objective in writing this book was to record information about local history and its relationship with landscape features.[289] This writing goal was accomplished, wherein he provided quite detailed landscape maps and associated oral history narratives. As such, this book remains an important source of spatial and oral history provided by iwi informants on landscape features within the Horowhenua. The landscape of the Kāpiti and Horowhenua Coast has been shaped by this incredibly rich oral history. According to Adkin, there are over 500 wāhi tapu[290] sites on the Kāpiti Coast[291] alone. Lake Waiorongomai is one listed regional example of a site of significance to Ngā Hapū o

[285] Ibid.
[286] Adkin, 1948, p. Pre-face note.
[287] Many original sketches, photographs and other creative activities are available for viewing at the National Library and Alexander Turnbull Library. Some are accessible online (www.natlib.govt.nz).
[288] Adkin, 1948, p. 2.
[289] Ibid, p. 1.
[290] The term wāhi tapu refers to sacred sites of significance to Māori and are often associated with birth, death, rituals, ceremonies, old battles, pā or kainga. "Maori recognize that within Papatūānuku there are wāhi tapu. These are sacred either because of events that have taken place there, or because they may be resources sites…" Matunga, 1994, Wāhi tapu: Māori sacred sites, p. 220.
[291] Kāpiti Coast District Council, 2007, The history of Te Whakaminenga o Kāpiti, p. 41.

Ōtaki.[292] It is to the emergence of these distinctive landscape features that we now turn our attention in Chapter 3.

[292] Greater Wellington Regional Council (GWRC), 2015, Proposed natural resources plan for the Wellington region: Te tikanga taiao o Te Upoko o Te Ika a Maui, p. 292.

Chapter 3 Contemporary cultural landscape and ecological health of Lake Waiorongomai

Tungia te ururoa, kia tapu whakaritotiro

te tupu a te harakeke.

Burn off the overgrowth, so that new shoots of the flax bush may grow.

This chapter draws on historical and oral accounts to show how cultural separation of local whānau[293] and hapū[294] from Lake Waiorongomai has led to subsequent ecological degradation at this site. Kaumātua[295] considered the whakatauki[296] above to be appropriate for the restoration project at Lake Waiorongomai. It draws attention to the, new shoots that emerge following the destructive influence of fire and to how these shoots will re-grow to protect and enhance this significant site. It is an analogy for revitalised cultural identity, cultural practices, biodiversity and wellbeing of local whānau, hapū and iwi[297] who are referred to and described in this chapter. In this whakatauki, "burning" alludes to the loss of surrounding land blocks through sale, leasing arrangements and colonising practices that added legal complexity to the internal and external relationships of all involved and associated with the lake, its wetlands and surrounds. In order to build collective agreement around a goal to restore Lake Waiorongomai Block 10, it was first necessary to overcome this legal complexity

[293] Family, extended family.
[294] Sub-tribe, clan.
[295] Elder/s.
[296] Proverb.
[297] Tribe, nation.

problem. This chapter attempts to capture the essence of the journey toward agreement and in doing so provides a more detailed context in which to focus on lake restoration process and outcomes in later chapters.

3.1 The cultural and ancestral landscape of Lake Waiorongomai

The western academic audience of this doctoral thesis will easily identify with the concept of a 'cultural landscape' that can be defined as a natural landscape that is fashioned by a particular cultural group or groups. There is a sense in which this model of landscape change[298] is slightly inadequate for use in communicating meaning in the domain of Te Ao Māori[299]. The term 'cultural landscape' attempts to describe the physical result on the natural landscape of human actions and interactions over time.[300] It also implies the existence of two discrete shaping categories (i.e. people and the natural world). As has been noted earlier in this thesis, the use of categorical logic in this way is inconsistent with fundamental assumptions of Te Ao Māori. Our tūpuna[301] did not perceive the various domains of the natural world (e.g. ngahere, awa and moana)[302] as being in some way separate from people. Rather, the various domains of the natural world were considered to be one whānau (family): the children of Papatūānuku[303] and Ranginui[304]. As such, the usefulness of the concept 'cultural landscape' in describing all things Māori is limited, even though this concept has been adopted and used internationally by landscape geographers, planners, landscape architects, ecologists, archaeologists and international organisations (e.g. UNESCO).

[298] Credited to the German Geographer Otto Schluter who introduced the concept in 1920. In James, P., & Martin, G., 1981, All possible worlds: A history of geographical ideas, p. 177.
[299] Māori worldview.
[300] Stephenson, J., et al. (Eds.), 2010, Beyond the Scene: Landscape and identity in Aotearoa New Zealand, p. 15.
[301] Ancestor/s.
[302] Forest, river and ocean.
[303] Earth mother.
[304] Sky father.

Thus, 'cultural landscape' is a western scientific notion that attempts to include the incredible diversity of worldview assumptions and perceptions of reality held by indigenous peoples. In some circumstances it adequately depicts settlement locations, battle sites, places of significant events along with heroes or particular ancestors.

Given the above, the title to this sub-section attempts to more effectively accommodate both a Te Ao Māori and western scientific interpretation by introducing the concept of 'ancestral landscape'. This new term extends the 'cultural landscape' definition, by drawing attention to the fact that the interaction between Māori and the whenua (i.e. landscape) can only be understood as one whānau that descend from common ancestors. In this thesis, both terms are used to describe Lake Waiorongomai since the early 1800s which reflects both Te Ao Māori and western scientific perspectives and influences. Both terms have their place. In particular, the emergence of a Pākehā cultural landscape based around the allocation of legal property rights and pastoral farming activities rapidly emerges, following the settlement of Pākehā within the Horowhenua post 1840.

In the remainder of this chapter, attention is focused on Lake Waiorongomai as one small part of what is, in reality a complex, regional, ancestral landscape. This detailed outline of the whānau relationships of Lake Waiorongomai draws on oral history, written history and visual representations of the experiences of our tūpuna.

3.1.1 Oral history and written descriptions of Waiorongomai Block 10 (Lake)

The oldest oral narrative that describes the naming of Lake Waiorongomai and other dominant Kāpiti Coast and Horowhenua region geographical features is passed down from a rangatira[305] and tohunga[306] of the Kurahaupō waka, Muaūpoko and Rangitāne whakapapa connections (Hau-nui-ā-nanaia) who visited this coastal area

[305] Chief.
[306] Priest, spiritual expert.

prior to the arrival of Ngāti Toa Rangatira and Ngāti Raukawa. The following oral narrative was provided by Ngāti Raukawa[307] and Ngāti Toa Rangatira kaumātua Te Waari Carkeek at the first Lake Waiorongomai Restoration Project (LWRP) wānanga (23 February 2014). This narrative is partially recorded in a lullaby that is written into a publication on the oral history to Māori place names.[308] Te Waari Carkeek added to the narrative, as handed down to him by oral narrative, notably with reference to Lake Waiorongomai.

> The story is about a tohunga called Hau-nui-ā-nanaia who travels down the west coast from Whanganui and named all the major waterways from Whanganui to Whangaehu, from Whangaehu to Turakina, from Turakina to Rangitikei and so on…[309]

Hau-nui-ā-nanaia was in pursuit of his runaway wife (Wairaka) and events along his journey provided names for the landscape. "… he strode across the land, hence Tīkei; Rangitikei", "river crossed by striding" and "he held his staff as he spoke, hence Ōtaki", "the holding out of a staff."[310] On catching up with Wairaka and as retribution for her betrayal, Hau-nui-ā-nanaia "cast a spell" turning Wairaka into a rock out in the Cook Strait near Pukerua Bay.[311] As Hau-nui-a-nanaia gazed east from a high vantage point he saw light, reflected on water and named the lake Wairarapa (Water of a Flashing Glance).[312] As the clouds lifted he named the place upon which he stood Te

[307] Ngāti Raukawa ki te Tonga and Ngāti Raukawa ki Waikato.
[308] Davis, 1990.
[309] T. Carkeek, personal communication, 12 November 2010.
[310] Davis, 1990, pp. 66-67.
[311] Ibid, p. 66.
[312] Ibid, p. 67.

Pae a Whaitiri (Lifting of the Clouds on High).[313] Although the lullaby ends here, Te Waari Carkeek continues the story.

> Hau-nui-ā-naia being exhausted from his hasty journey took advantage of a passing comet and after the appropriate karakia[314] and incantations caught the comet heading back up along the Kāpiti coast. From the comet as he gazed down on the land and coastal waters he witnessed a lot of flotsam and jetsam at one location which is known as 'parapara' to Maori and the coastline was in the shape of an 'umu' a cooking pot and thus he named the area Paraparaumu. Just after Ōtaki the tohunga's cloak caught on fire from the comet so he jumped off throwing the cloak to the ground. The place where the cloak landed created Lake Kahuwera, named from the 'cloak – kahu' being 'hot – wera'.[315]
>
> The comet crash landed at this place [Lake Waiorongomai]. Rongomai is the name of the comet. Rongomai was an atua[316] of Hau-nui-ā-nanaia who came to his invocations to assist.[317,318]

Lake Waiorongomai is closely associated with Te Rauparaha and his Ngāti Toa Rangatira, Ngāti Raukawa and Te Āti Awa warriors who used this sacred place and its waters for ritual cleansing[319] after battles.[320] George Adkin provided notes on the place

[313] Ibid.
[314] Prayer/s.
[315] T. Carkeek, personal communication, 22 February 2014.
[316] God, deity.
[317] T. Carkeek, personal communication, 7 November 2016.
[318] "Mukukai is another taniwha pai of Ngāti Raukawa and he was of Ngāti Raukawa and he was invoked to come and assist." T. Carkeek, personal communication, 7 November 2016.
[319] Whakanoa (free from sacredness, to make ordinary).

names of Lakes Waiorongomai and Kahuwera describing them as lagoons (Figure 3.1.1).[321]

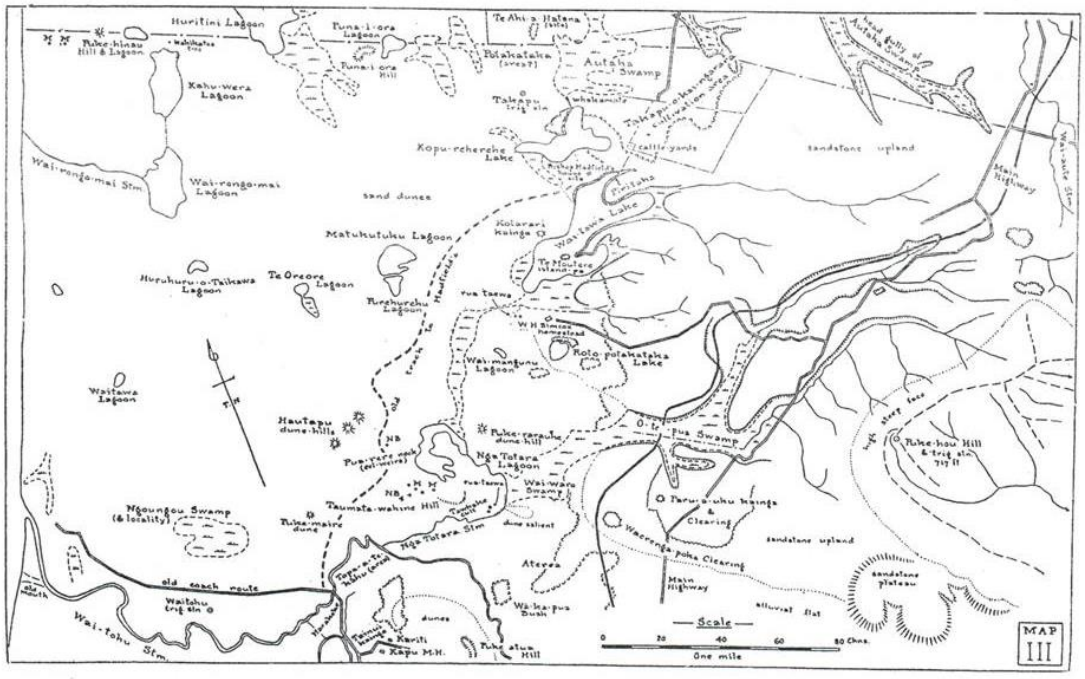

Figure 3.1.1 Waitohu Stream to Lake Kahuwera Map. *(Source: Adkin, G., 1948, Appendix Map III)*

Adkin refers to the lake as Wairongomai (note spelling). He writes that the name of the lake has no connection to the deity - Rongomai.[322] Instead he argues that "the local lagoon name signifies 'the waters (wai) where warriors cleansed themselves after war and donned the garments (mai) of peace (rongo)'."[323] However, it is now generally acknowledged that the correct name is Waiorongomai.[324] Adkin's interpretation of the name of the lake is acknowledged as being mostly correct. However, local tikanga and oral history indicate that the practice of whakanoa to cleanse and the donning of garments of peace would likely have included a spiritual recognition and karakia to the atua of peace, Rongomai.

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[320] T. Carkeek, personal communication, 22 February 2014.
[321] Adkin, 1948, pp. Appendix Area Maps – Map III.
[322] Ibid, p. 402.
[323] Ibid.
[324] T. Carkeek, personal communication, 12 November 2010.

Adkin describes Lakes Waiorongomai and Kahuwera as follows:

> One of the larger lagoons of the Horowhenua dune-belt. It [Waiorongomai] is situated a little over half a mile from the coast and the same distance south of the Ngāti Wehiwehi – Ngāti Maiotaki inter-hapū boundary line. A stream of the same name drains its surplus waters to the sea, and a swampy tract connects it with the (originally) equal-sized lagoon named Kahuwera, on its northern side. The partial drainage of this swamp has now considerably diminished the size of Kahuwera but Wai(o)rongomai is still an extensive sheet of water.[325]

Adkin's reference to Lake Kahuwera is mis-spelt as 'Kahuera' and 'Kauhera'.[326] He provides the accepted translation of the name Kahuwera which is "burnt cloak or garment".[327] Adkin also describes Lake Kahuwera as:

> One of the larger and better known lagoons of the Horowhenua dune-belt. It is situated about 50 chains from the coast and about half-way between the courses of the Waikawa and Waitohu streams. This lagoon occupies a broad, shallow basin, and is connected with the Waiorongomai Lagoon, half a mile farther south, by a swamp watercourse, now a drain.[328]

Te Waari Carkeek provided the following description in an interview with Queenie Rikihana when asked about the original ownership of Lake Waiorongomai:

[325] Adkin, 1948, pp. 401-402.
[326] Ibid, p. 167.
[327] Ibid.
[328] Ibid.

> The whakapapa of the vesting of Lake Waiorongomai from our Ngāti Toarangatira / Raukawa chief Te Rauparaha happened in the 1820's when he gave it over to Matiu Rorohau of Ngāti Waihurihia and Ngāti Kapu. He and his family lived in and around the Lake until he died and his descendants passed away as well… There were no descendants of his – they could have succumbed to diseases – so it was only his relatives left… his cousins on each side took over ownership of it and they all lived on the land in a sort of ad hoc basis. Ngāti Waihurihia were still living out at Waiorongomai in the 1840's and when Rangiatea Church as being built in 1848 and 1849 the people there fed those working on the church. Christianity had also come by then and the Māori missionaries were sent out to try and persuade those living there to become Christians. It took quite a while to persuade Ngāti Waihurihia to move back into the town (Ōtaki)…. In time the relatives of families such as Tahiwi, Rikihana, Te Waru put petitions in for their part of the land and that is how it got to the court cases.[329]

Miki Rikihana wrote a case study on Lake Waiorongomai in 1988 which was included in the Ngāti Toa Rangatira, Ngāti Raukawa, Te Āti Awa ki Waikanae[330] Fisheries Claim Report.[331] In this he identified the main hapū of Ngāti Raukawa ki te Tonga who had fishing rights in the area of Lake Waiorongomai, Lake Kahuwera and the surrounding wetlands as Ngāti Pare, Ngāti Waihurihia, Ngāti Maiotaki, Ngāti Koroki and Ngāti

[329] Te Rūnanga o Raukawa Inc., 2011, Attachment 2. (unpublished report)
[330] Another name for Te Āti Awa ki Whakarongotai.
[331] Ngā Kaitiaki o Raukawa, date unknown, pp. 83-85. (unpublished report)

Moewaka. He describes the temporary papakāinga[332] that were used seasonally from November through to May being operational up until the 1940's. The map he produced below shows the locations of the papakāinga for each of the hapū, indicated by an asterisk in Figure 3.1.2. This kaumātua also informed us in this text that the main living pā[333] for these people was inland 2 kilometres at Ngātotara (Forest Lakes area) and south 5 kilometres at Pakakutu.

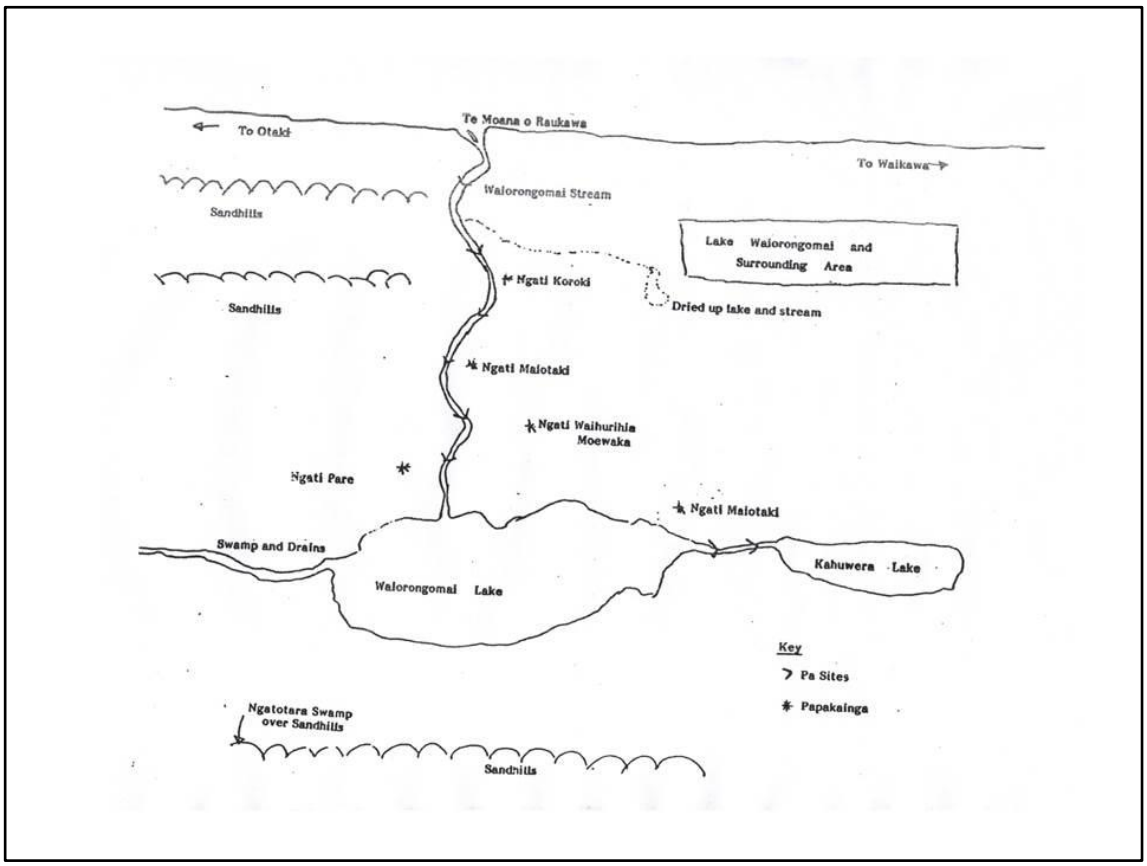


Figure 3.1.2 Papakāinga and pā tuna (eel weir) sites. *(Source: Ngāti Toarangatira, Āti awa ki Waikanae, Ngāti Raukawa, Iwi Fisheries Claim Report, date unknown)*

Adkin provides a dedication of indebtedness to Utiku Hapeta, head of Ngāti Maiotaki at the time for providing him with details of the ancestry of Ngāti Raukawa ki te Tonga

[332] Original home, home base.
[333] Village, occupation site.

hapū of the Ōtaki district.[334] The five hapū listed below are derived from significant ancestors who also descend from the paramount iwi chief Raukawa, shown pictorially in the following whakapapa chart (Figure 3.1.4). The hapū and their rohe[335] described in Adkin's narrative is provided below in Table 3.1.1 in alphabetical order.

Table 3.1.1 Hapū descriptions

Ngati Huia	This is the hapu of Ngati Raukawa that takes its name from Huia, son of Ngatokowaru. Ngati Huia hold two separate portions of the Horowhenua territory; one, on the south side of the Otaki River, from it to the Mangaone Stream; the other, on the northern side of the augmented Muaupoko block. The southern section of this hapū has now largely dispersed. Formerly their principal pa was Katihiku, and the present day Katihiku settlement, 35 chains south-west of the original pa-site, is inhabited by only a few remaining whānau. In recent years the Hawea family was the principal one
Ngati Kapu	A small hapu of Ngati Raukawa at Otaki. Its territory is limited to lands on either side of the lower course of the Waitohu Stream. The former Puke-karaka pa was situated within this hapū area and existing village is called Tainui.
Ngati Maiotaki	A hapu of Ngati Raukawa occupying a large area at Otaki in conjunction with two other hapu, Ngati Moewaka and Ngati Waihurihia. Their territory extends from the southern boundary of Ngati Wehiwehi strip to the course of the Otaki River, and from the coast-line to the mountain-tops except for a relatively small area near the coast occupied by Ngati Kapu. The principal community centre of these hapū is Raukawa meeting house at Otaki. Maiotaki, the eponymous ancestor of the hapu, was a son of Tamatahura, and thus of the third generation from Raukawa, the tribal head. The similarity of the latter part of Maiotaki's name (Mai-o-taki) to that of the locality in which the hapū is now domiciled is merely a coincidence. This exemplifies the importance of ascertaining the exact significance of hapu and tribal names, and indeed of place-names generally, their origin and meaning throwing light on many points of difficulty and possible confusion."[336]
Ngati Moewaka	A hapū of Ngati Raukawa occupying a large area at Otaki in conjunction with two other hapū, Ngati Maiotaki and Ngati Waihurihia. Moewaka the eponymous ancestor of the hapu, was of the sixth generation from Raukawa.
Ngati Waihurihia[337]	A hapū of Ngati Raukawa occupying a large area at Otaki in conjunction with two other hapu, Ngati Maiotaki and Ngati Moewaka. Waihurihia was of the sixth generation from Raukawa. He was a son of Ngatokowaru by his second wife,

[334] Adkin, 1948, p. 255.
[335] Territory.
[336] Adkin, 1948, pp. 250-251.
[337] Note: mis-spelt in the book as Ngāti Waihurahia.

	Te Ruai; his half-brothers were Huia and Matau, sons of Pareunuora, the first wife of Ngatokowaru; all became eponymous ancestors of hapū of Ngati Raukawa.

(*Source: Adkin, G., 1948, pp. 249-251*)

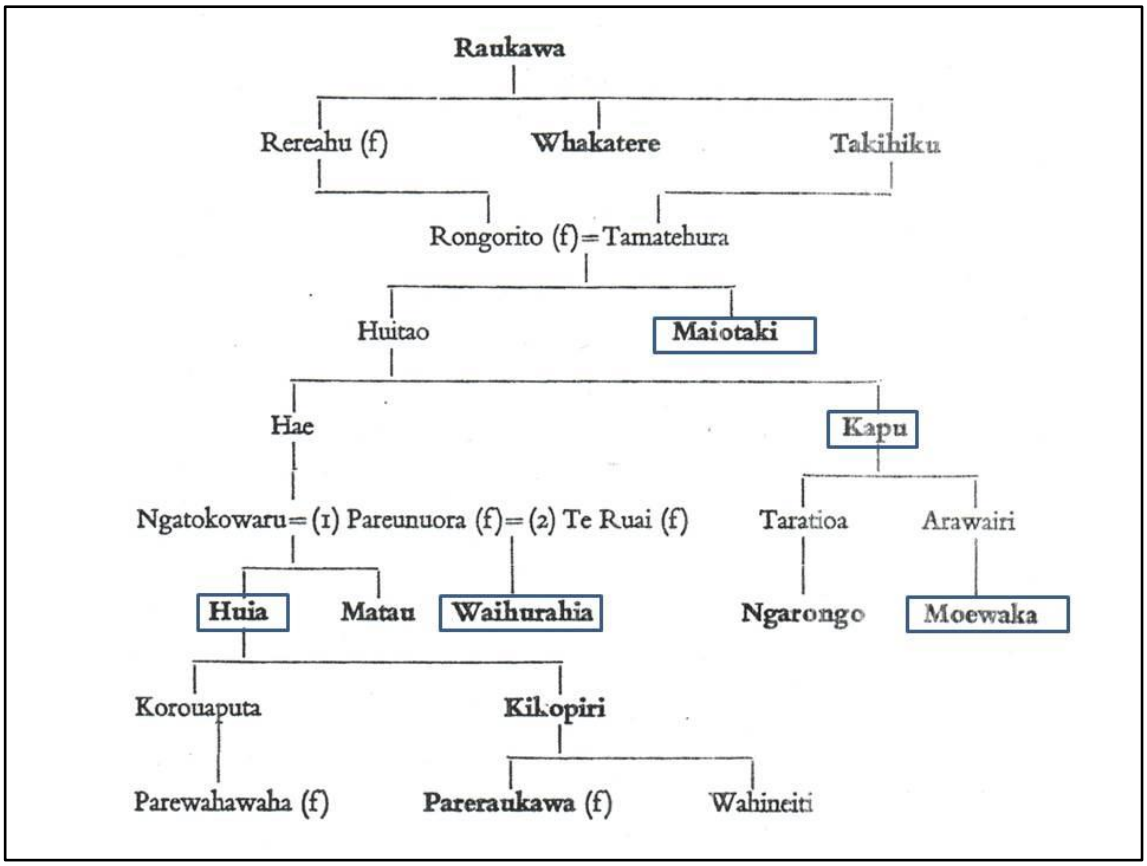


Figure 3.1.3 Ngāti Raukawa ki te Tonga hapū whakapapa chart. *(Source: Adkin, G., 1948, p. 253)*

3.1.2 Early Native Land Court rulings on Waiorongomai Block 10

The Native Land Court[338] was one of the colonising mechanisms used to sever the ties of Māori with their lands.[339] This goal was achieved in part by decreasing the owners from the multiple and numerous hapū members to a maximum number of owners, for example ten to begin with. Later, increasing the number of owners made subdividing and negotiating easier. This mechanism together with Europeanising influences such as missionaries and trade influences in the 1850's had led to weakening the former and somewhat complex communal model of tribal ownership.[340]

The Native Land Court information provided in this sub-section is based on robust research conducted by kaumātua Rupene Waaka, who gave a number of presentations for MTM Horowhenua (including Victoria University Landscape Architecture students), as well as whānau and hapū initiatives. He provided permission to cite his material.[341]

Rupene pointed out that the Native Land Court ruled "no hapū hopping".[342] This was to prevent the same person claiming more than one share through whakapapa links to one hapū and then also claiming another share through whakapapa links to another. It is a traditional Māori practice to recognise and respect whakapapa connections with pride and link to a number of iwi, hapū and whānaunga[343]. It was also common practice to

[338] "Native was altered to Māori by section 2, Māori Purposes Act, 1947, No 59." Cited in Waaka, R., 2014b, Ngāti Maiotaki Waiorongomai Blocks 9 and 9A walkabout presentation (11 January 2014), Slide 1. Now known as Māori Land Court.
[339] Hamer, D., 1978, The settlement of the Otaki district in a New Zealand perspective, p. 8; Keenan, D., 2002, Bound to the land: Māori retention and assertion of land and identity, p. 247; Meredith, P., *et al*., 2016, Ko Rangitīkei to awa – The Rangitīkei River and its tributaries cultural perspectives report, p. 214; Smith, S., 2007, pp. 12-13.
[340] Hamer, 1978, p. 8.
[341] R. Waaka, personal communication, 30 June 2014.
[342] Native Land Court Otaki Minute Book (NLC OMB) 19, 1891, p. 153. Cited in Waaka, 2014b, Slide 9.
[343] Relation.

claim the strongest ties to a particular iwi, hapū or rohe. The "no hapū hopping" ruling by the Native Land Court resulted in severing hapū ties.

The first reference of Lake Waiorongomai in the Native Land Court was made by Rota Te Tahiwi who commenced a claim for Lake Kahuwera[344] in 1867.[345] After adjournments[346] the ruling in 1869 for Lake Kahuwera was "Judgement in favour of Ngatimaiotaki".[347] Notwithstanding that "Rota (Te Tahiwi of Ngāti Maiotaki) said that he did not wish a separate grant for Kahu(w)era as it was included in the survey of Waiorongomai, if he proved his title to Waiorongomai, he wished one grant for the whole".[348] In total, at that time the Waiorongomai land block was an estimated 1963 acres (Figure 3.1.5).[349]

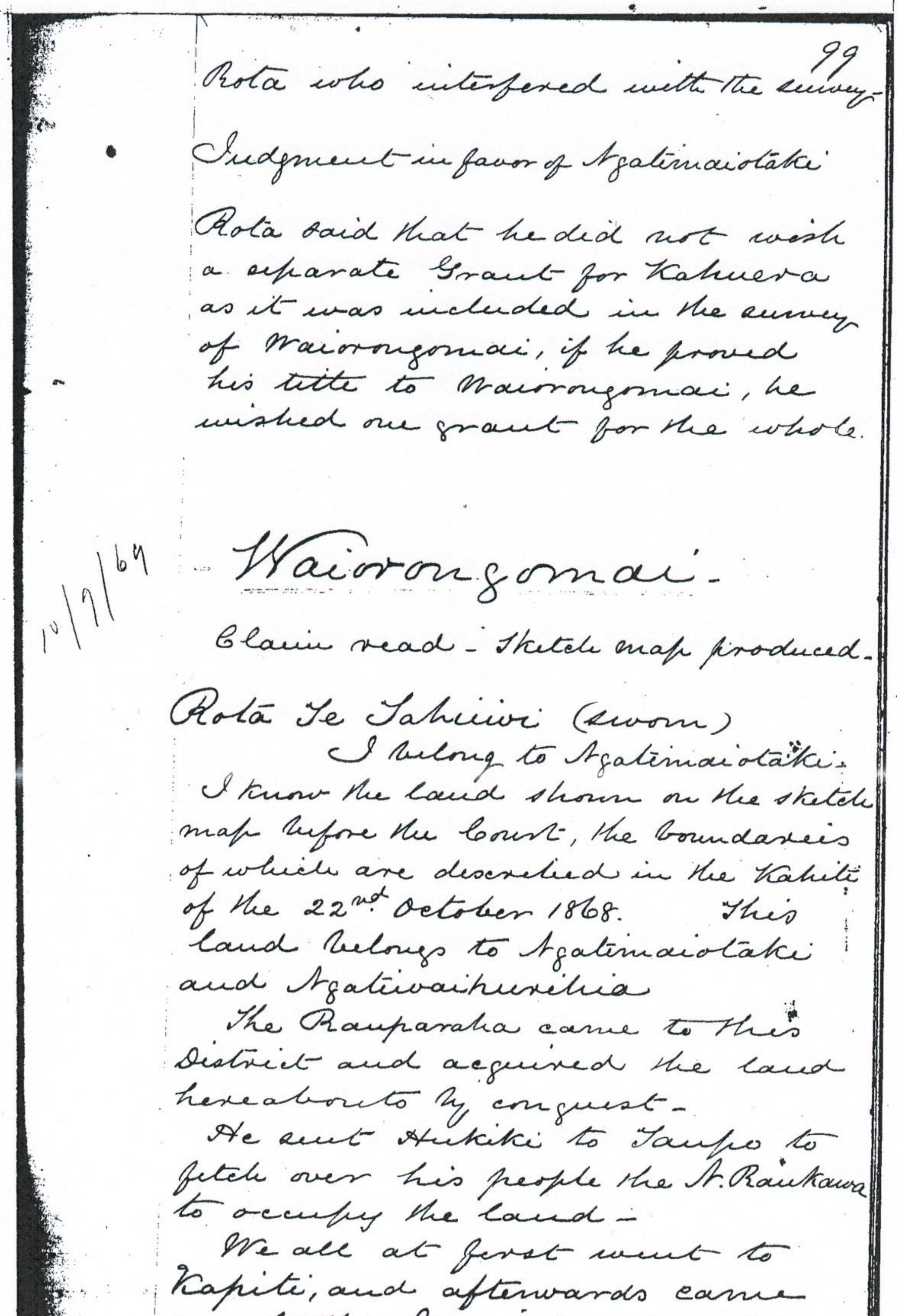
Figure 3.1.4 Waiorongomai Block map. *(Source: Waaka, R., 11 January 2014, Presentation Slide 23. Original source: Land Information New Zealand)*

[344] Spelt incorrectly as Kahuera in the Native Land Court Minutes.
[345] NLC OMB 1B, 1867, p. 47. Cited in Waaka, 2014b, Slide 2.
[346] NLC OMB 1G, 1869, pp. 85-99.
[347] Ibid, p. 99.
[348] NLC OMB 1G, 1869, p. 99.
[349] Land Information New Zealand. Cited in Waaka, R., 2014a, Lake Waiorongomai overview presentation for MTM and Victoria University Landscape Architecture student wānanga, 6 March 2014, Raukawa Marae, Ōtaki, Slide 2.

Thus, Lake Waiorongomai first appeared in a Native Land Court case to settle ownership on the 10th of September 1869. Rota Te Tahiwi[350] began his Waiorongomai claim with a few important historical accounts:

> I know the land shown on the sketch map before the court, the boundaries of which are described … 22nd of October 1868. This land belongs to Ngatimaiotaki and Ngatiwaihurihia. The Rauparaha came to this District and acquired the land here abouts by conquest. He sent Hukiki to Taupo to fetch over the people the N[gāti] Raukawa to occupy the land. We all at first went to Kapiti, and afterwards came over to the Mainland to Kotikoti whenua. The Ngatimaiotaki, Ngatiwaihurihia and Ngatikapu, occupied the piece till the time of the battle of Haowhenua. When they left and went to Otaki after the war they again occupied the land. At that time Ngatikapu were on this land with us we were all together until after the Kuititanga after the Pakehas came we commenced to have disputes. [sic][351]

[350] "Died 1871. Rota is his baptism name." R. Waaka, personal communication, 20 November 2017.
[351] NLC OMB 1G, 1869, pp. 99-100.



99

Rota who interfered with the survey -

Judgment in favor of Ngatimaiotāki

Rota said that he did not wish a separate Grant for Kahuera as it was included in the survey of Wairongomai, if he proved his title to Wairongomai, he wished one grant for the whole.

10/9/69 Wairongomai.

Claim read - Sketch map produced -

Rota Te Tahiwi (sworn)

I belong to Ngatimaiotāki -

I know the land shown on the sketch map before the Court, the boundaries of which are described in the Kahiti of the 22nd October 1868. This land belongs to Ngatimaiotāki and Ngatiwaihurihia

The Rauparaha came to this District and acquired the land hereabouts by conquest -

He sent Huikiki to Taupo to fetch over his people the N. Raukawa to occupy the land -

We all at first went to Kapiti, and afterwards came over to the Mainland to

Figure 3.1.5 Native Land Court entry Rota Tahiwi. *(Source: Native Land Court Ōtaki Minutes Book 1G, 1869, p. 99)*

Although there were counter claimants and descriptions of historical occupancy by the ART confederation iwi and hapū[352], the Waiorongomai 1869 judgement culminated "in favour of Rota and party. Rota recalled and said the grantees we propose (as owners) are" [353] (listed below in Table 3.1.2). Sixteen others were registered as interested persons at this time (listed below in Table 3.1.2) and the site was to be surveyed.[354] The map created is shown in Figure 3.1.6 for a surveyors charge of £17.12.0.[355] All owners of Waiorongomai Block 10 (Lake) have whakapapa links to these 26 individuals.[356]

Table 3.1.2 Owners and interested parties in Waiorongomai Block 10

Owners	**Interested parties**
Rota Te Tahiwi	Horimia Pitaua
Hohipuha Kareanui	Te Harawira Te Whio
Rawiri Wanui	Nuna te Taurei
Hori Te Waru	Hekiera te Wharewhiti
Te Rei Parewhanake	Hapeta Te Rangikatakua
We Hopihana Wharewhiti	Pita Pukeroa
Kepa Kerikeri	Akatohe Tipao
Maika Takarore	Taitua Temapehi
Peni Te Hapupu	Pirika Te Hurihanga
Ropata Te Ao	Rawiri Te Tahiwi
	Wiremu Paki
	Te Pehara
	Te Iwiata
	Hopa Tahaia
	Manihera Te Rau
	Pou

(*Source: Native Land Court Ōtaki Minute Book 1G, pp. 123-124*)

[352] NLC OMB 1G, 1869, pp. 100-123.
[353] Ibid, p. 123.
[354] Ibid, pp. 123-124. Cited in Waaka, 2014a, Slides 6 & 7.
[355] NLC OMB 1G, 1869, p. 124.
[356] R. Waaka, personal communication, 11 January 2014.

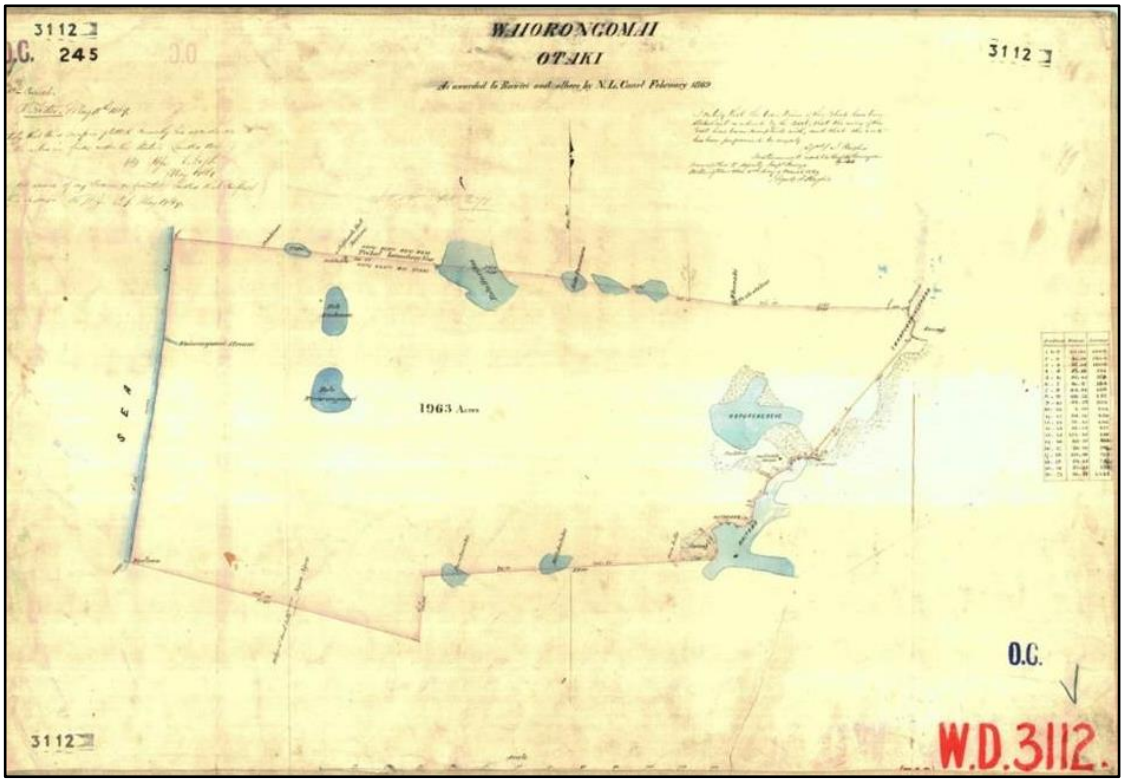


Figure 3.1.6 Waiorongomai Block Survey Map. *(Source: Waaka, R., 6 March 2014, Presentation Slide 8. Original source: Land Information New Zealand)*

Later through a Supreme Court decree (16 September 1891) the original 1869 Native Land Court order of 10 owners became void and a total of 26 people were declared owners of the Waiorongomai Block.[357] A subdivision case for the Waiorongomai Block then commenced in the Native Land Court in 26 October 1891.[358] After a number of adjournments[359] eventually the Waiorongomai Block of 1,963 acres that included Lakes Waiorongomai and Kahuwera were subdivided into 10 blocks (listed below).[360] Two blocks (Waiorongomai 1 and 10) were declared "general reserves" (Table 3.1.3). Waiorongomai Block 1 was situated along the beachfront and Waiorongomai Block 10 surrounded Lake Waiorongomai and the Waiorongomai Stream (Figure 3.1.7). The

[357] NLC OMB 18, 1891, pp. 278-279; Waaka, 2014a, Slide 10.
[358] NLC OMB 18, 1891, pp. 277-305. Cited in Waaka, 2014b, Slide 11.
[359] NLC OMB 18, 1891, pp. 307-367, 372-391, 394-396, 404-405, 419-420, 477-481. Cited in Waaka, R., 2014a, Slides 12-13.
[360] NLC OMB 18, 1891, p. 394. Cited in Waaka, 2014a, Slide 13.

reason was that these two blocks were significant areas for collecting kai and resources for iwi and hapū, therefore they were reserved for future generations by these tūpuna.[361] Lake Waiorongomai was also considered to be a wāhi tapū[362] and a significant site to be protected.[363]

Table 3.1.3 Waiorongomai block initial subdivision

Waiorongomai 1	General reserve
Waiorongomai 2	*aka* Lake Kahuwera
Waiorongomai 3	
Waiorongomai 4	
Waiorongomai 5	
Waiorongomai 6	
Waiorongomai 7	
Waiorongomai 8	
Waiorongomai 9	*aka* Takapu
Waiorongomai 10	*aka* Lake Waiorongomai "general reserve"

(*Source: Waaka, R., 3rd March 2014, Ngāti Maiotaki Waiorongomai Blocks 9 and 9A walkabout presentation at Taaringaroa, Ōtaki, Slide 12*)

The remaining eight sections were allocated and divided between people and hapū.

> The Court decided that 80 acres [Wai No 5] should be allotted to Pene te Hapupu and that the remainder of the land exclusive of the part called Te Takapu [Wai No 9] the Sandy part [Wai No 1] and the Waiorongomai Roto [No 10] should be divided equally between the two hapu's Ngatimaiotaki and Ngatiwaihurihia. That all the persons ["26"] in the Certificate should share in the Sandy part [Wai No 1] and the Waiorongomai Roto that half the 80 acres [Wai No 5] for Pene te Hapupu should be laid off about the boundary at Te Ngoungou and that the Ngatimaiotaki take

[361] R. Waaka, personal communication, 6 March 2014.
[362] Sacred site.
[363] Ibid.

the Northern ½ of the remainder of the block and the Ngatiwaihurihia southern half.[364]

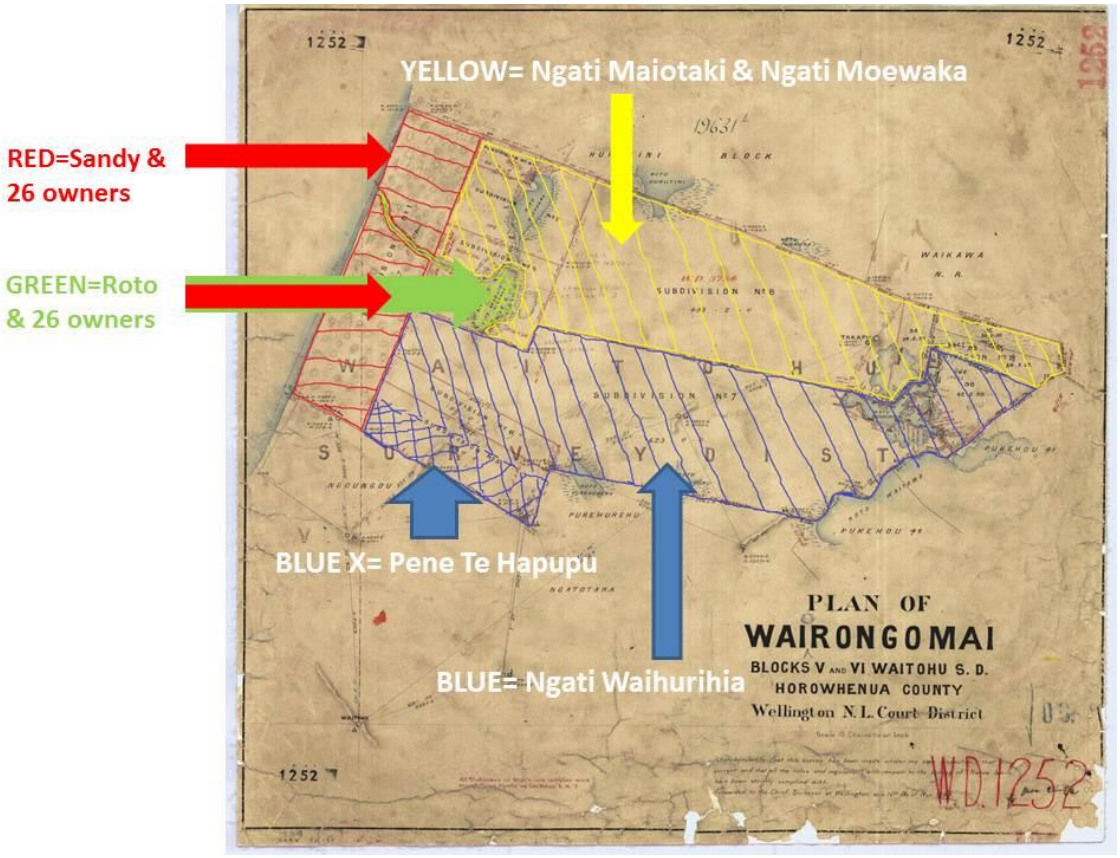


Figure 3.1.7 Subdivision of Waiorongomai Block to hapū and individuals. *(Source: Waaka, R., 6 March 2014, Presentation. Original source: Land Information New Zealand)*

Since the subdivision ruling in 1891, the ten blocks were further subdivided, including Waiorongomai Block 1, which ceased to be a reserve. The order to partition Waiorongomai Block 1 was held in the Wellington Native Land Court sealed by the Judge on the 5th of December 1891.[365] The owners gathered in Court that day sold 200 acres of the 267 acres in Waiorongomai 1 to William Martin Simcox setting aside 33.5 acres either side of Waiorongomai Stream (Waiorongomai Block 10) which became

[364] NLC OMB 18, 1891, p. 426. Cited in Waaka, 2014a, Slide 14.
[365] Material provided with permission for use by Kaumātua and Waiorongomai 1A Trustee, Nick Albert 19 November 2012, a copy of the Native Land Court Wellington Minute Book 20, p. 353, as well as a copy of the Partition Order for Waiorongomai No. 1A, Wn N. B. 20/35-1.

Waiorongomai Block 1A.[366] In 1891 the listed owners of Waiorongomai 1A numbered 59.[367]

In accordance with the foresight of our tūpuna Waiorongomai Block 10 remains a reserve for future generations. On the 20th of March 2003 under the Te Ture Whenua Māori Act 1993 it was "set apart as a Māori reservation for the purpose of fishing, water catchment and cultural, historical and scenic interest for the common use and benefit of the beneficial owners of Waiorongomai 10 (Lake) Block."[368] The purposes of the Ture Whenua Act 1993 are (i) to recognise that Māori land is a taonga tuku iho a precious heritage to Māori, and (ii) to promote the retention of Māori lands to remain in Māori ownership.[369]

3.1.3 The emergence of a Pākehā cultural landscape on the Waiorongomai block

John Hadfield[370] is the first Pākehā farmer to lease the 100% Māori owned 'Forest Lake' area[371], this included the Waiorongomai and Pukehou Blocks (Figure 3.1.8).[372] William Henry Simcox[373] first visited the Forest Lakes area in 1877 and returned to take up residency in Ōtaki the following year.[374] W. Simcox looked over the Māori-owned lands that Hadfield was occupying as a sheep run, he was favourably impressed. Simcox was informed that there were restrictions at the time on certain native lands

[366] Material provided with permission for use by Kaumātua and Waiorongomai 1A Trustee, Nick Albert 19 November 2012, a copy of the Native Land Court Wellington Minute Book 20, p. 353.
[367] Material provided with permission for use by Kaumātua and Waiorongomai 1A Trustee, Nick Albert 19 November 2012, a copy of the Partition Order for Waiorongomai No. 1A, Wn N. B. 20/35-1, Schedule No. 1A Block.
[368] New Zealand Gazzette, 3 April 2003, p. 913. Cited in Waaka, R., 2014a, Slide 22.
[369] Mead, 2003, p.276.
[370] Alexander John Hadfield, the nephew of Archdeacon Octavius Hadfield. Octavius Hadfield was then in charge of the Parish of Kāpiti with headquarters at Ōtaki. Cited in Simcox, F., 1960, The story of Forest Lakes, p. 4. Octavius Hadfield is considered partly responsible along with Wi Parata for taking land at Ōtaki and Porirua which disadvantaged the local iwi. A. Te Aomarere, personal communication, 7 November 2016.
[371] John Hadfield designated this English name to this area.
[372] Farthing, B., 1978, Forest Lakes, p. 11.
[373] Born in England 24 September 41. He arrived at Auckland, New Zealand from Birmingham, England 21 October 1862. Cited in Simcox, 1960, p. 4.
[374] Farthing, 1978, p. 11.

which prohibited their sale, this evidently affected the Forest Lakes lands, and a judge of the Native Land Court informed him "that they [the restrictions] would never be removed."[375] This would change.

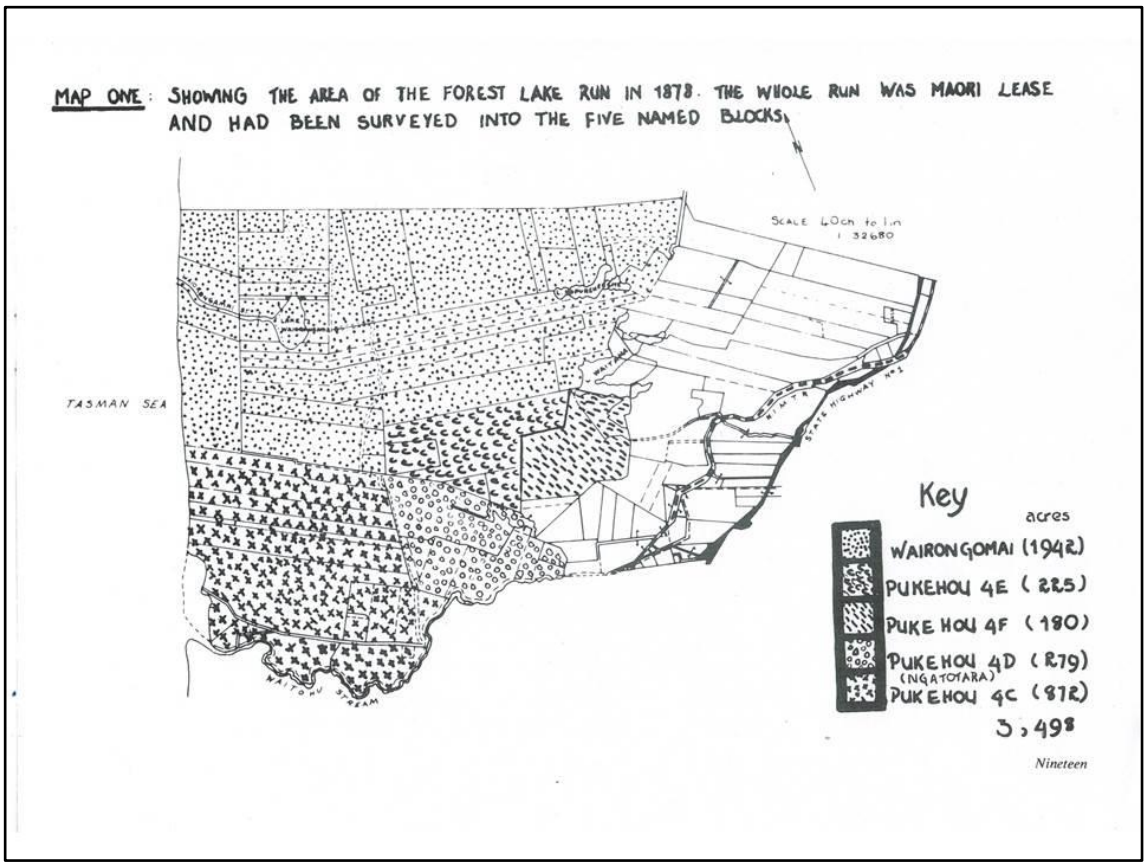


Figure 3.1.8 Waiorongomai and Pukehou Blocks. *(Source: Farthing, B., 1978, p. 19)*

Simcox went into partnership with Hadfield to farm the Forest Lake area in 1878, however within the year Hadfield pulled out and F.W. Rutherford took over his half share.[376] That partnership lasted 10 years until 1888 when Simcox bought Rutherfords share at 3,500 pounds at that time included freehold lands as well as leaseholds lands (Figure 3.1.9), livestock and wool.[377] Mr and Mrs Simcox were devout Christians and

[375] Simcox, 1960, p. 5.
[376] Farthing, 1978, p. 12.
[377] Ibid, pp. 12-13.

became trusted and respected by the local Māori population.[378] Farthing points out this trust, together with the whānau severing of ties with their whenua allowed Mr Simcox to purchase local Māori land blocks as they became available.[379] Evident in the following map (Figure 3.1.9) by 1919, Mr Simcox was farming 4,203 acres in the Forest Lakes area and of this he owned 1,823 acres (43%). At that time just over half the land was still in Māori ownership.

> During W.H. Simcox's life at Forest Lakes (1878-1919) most of the Blocks were resurveyed and broken into smaller sections so that the Māori Court could more easily allocate Māori owners…. During this period the Māori population was declining in numbers through ill-health and hence Simcox found himself dealing with limited numbers. Purchases were usually made if, on the death of a Māori his heirs had moved from the area and had no interest; or, if they had run into debt and needed money. Such actions lead to a fragmentation of Māori land and created difficulties with regard to future economic management.[380]

[378] Ibid, p. 14.
[379] Ibid.
[380] Ibid.

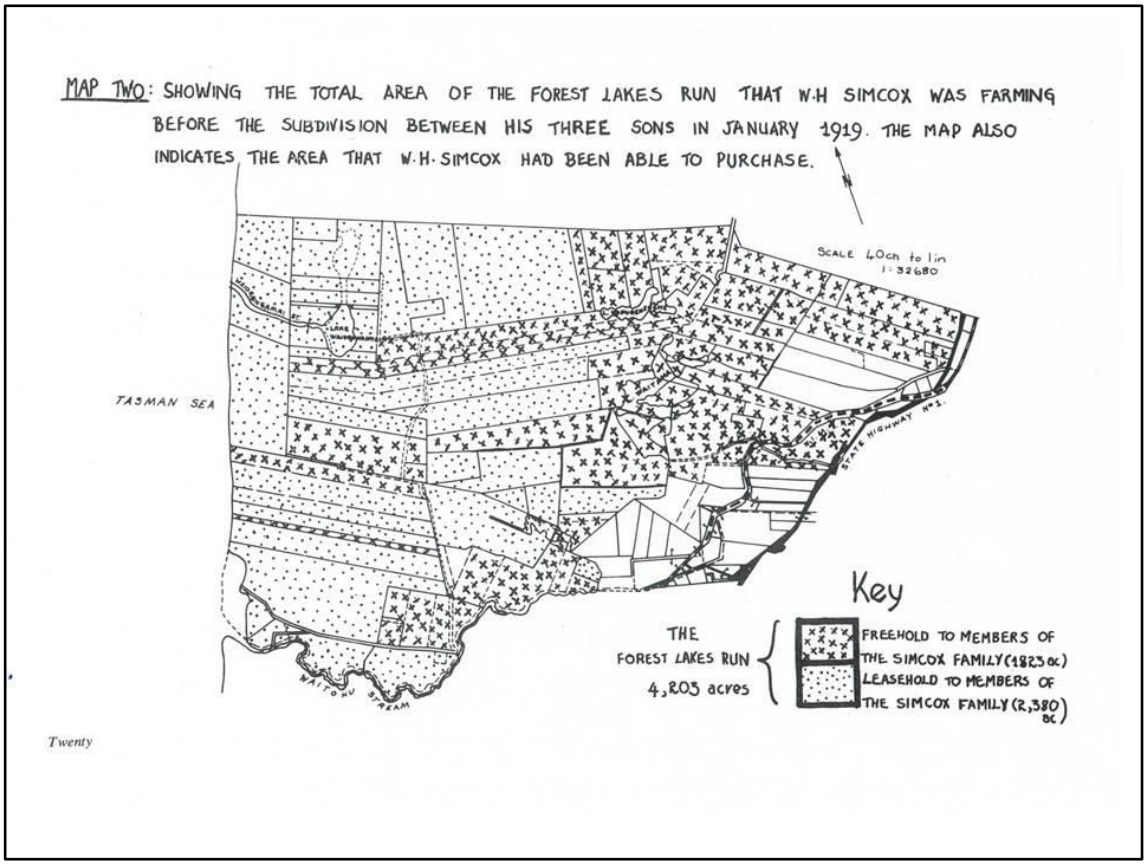


Figure 3.1.9 Waiorongomai and Pukehou freehold and leasehold blocks. *(Source: Farthing,B., 1978, p. 20)*

In 1919, at the age of 78 years William Simcox handed over his freehold and leasehold lands to his three sons – Martin, Selwyn and Percy (Figure 3.1.10).[381] These sons and their wives did not have the same rapport with Māori.[382] In 1920, Pairoroku Rikihana[383] applied to the Native Land Court for an injunction because the leasee Selwyn Simcox (according to Figure 3.1.10), was installing drainage between Lake Kahuwera and Lake Waiorongomai which significantly decreased the size of Lake Kahuwera.[384]

> "European is digging drains – has no right on land – digging drains will empty lake where we get eels. We have had a

[381] Ibid.
[382] Ibid, p. 15.
[383] "Ngāti Waihurihia." R. Waaka, personal communication, 20 November 2017.
[384] Waaka, 2014a, Slide 18.

conference with Mr Simcox and Mr Simcox senior told us he would instruct his son not to drain further. Then later I proceeded to fill up drains & I found Simcox still making drains – Mr Simcox has lease of lands near lake but only to within a chain of these lakes - & to ½ a chain of stream."[385]

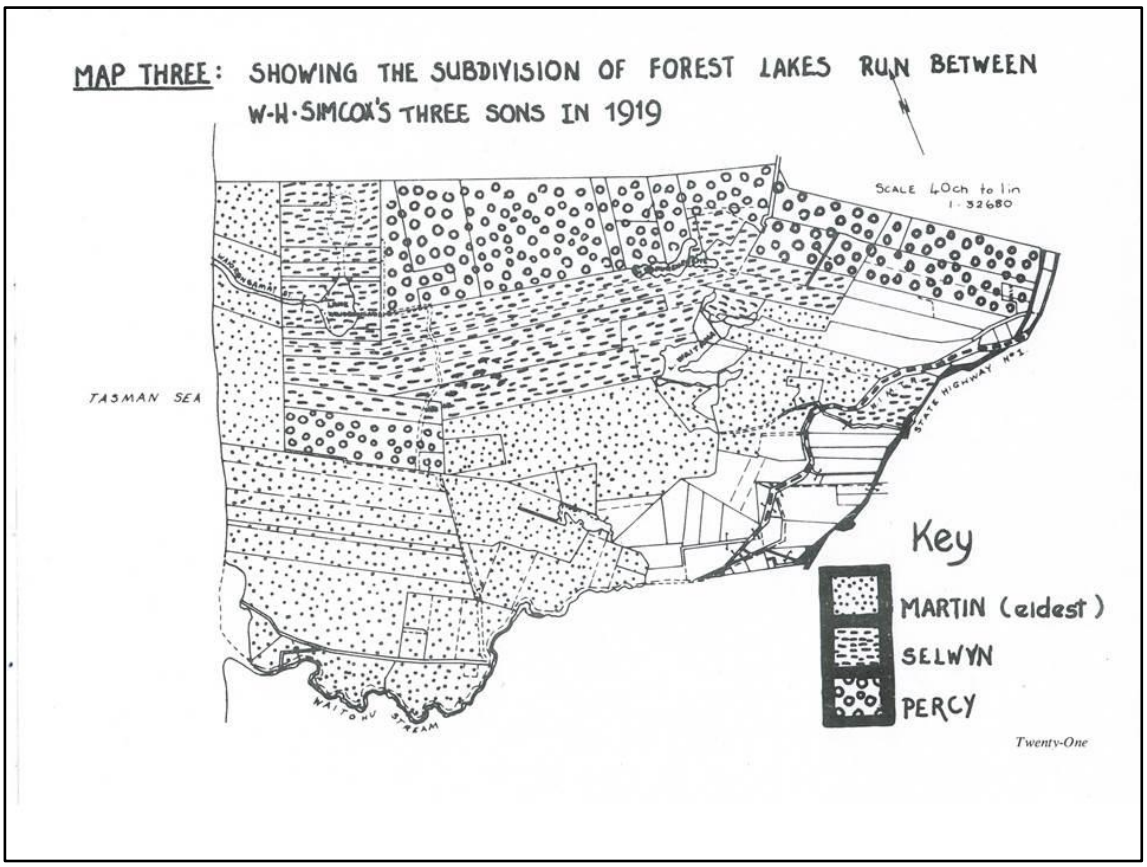


Figure 3.1.10 Waiorongomai and Pukehou Block divided amongst Simcox whānau. *(Source: Farthing, B., 1978, p. 21)*

The injunction continued in court in 1921. The quote below shows that Mr S. Simcox had attempted to drain Lake Waiorongomai in a way which Pairoroku Rikihana highlighted to the judge had significantly decreased the eel population and catches.[386]

[385] NLC OMB 55, 1920, p. 213. Cited in Waaka, 2014a, Slide 18.
[386] NLC OMB 56, 1921, p. 57. Cited in Waaka, 2014a, Slide 19.

> …Simcox drained Kahuera into Wairongomai and as this caused the latter [the lake] to rise he cut a drain to dry the Waiorongomai Lake as well. The result is that we were this last season deprived of our eel supply Since the cutting of the drain from Waiorongomai to the beach the latter became almost dry The drain reduced the height of the water by at least 18 inches We desire to prevent Simcox from draining the lake…[387]

The judgement was:

> …there was no jurisdiction under (f) of sec 24 of the act of 1909 to restrain Simcox by an injunction as there was no matter before the court relative to Lake Waiorongomai The proper procedure was an action in the supreme court for damages and an injunction. Mr Simcox was not only permitted to drain his leasehold but was obliged by the covenants in his lease to do so but such did not justify him in committing waste or in detrimentally interfering with another block. This court had no jurisdiction to issue or power to enforce an injunction – Application dismissed.[388]

Unfortunately for the Māori owners of Waiorongomai Block 10, the injunction was dismissed because the judgement was not in favour of Lake Waiorongomai. In the judge's opinion, the leasee actions were in accordance with his lease agreement which allowed for increasing grazing areas.[389] The judge's European perspective did not perceive these actions as detrimental to or interfering with another block, even though

[387] NLC OMB 56, 1921, p. 57. Cited in Waaka, 2014a, Slide 19.
[388] NLC OMB 56, 1921, p. 58. Cited in Waaka, 2014a, Slide 20.
[389] Ibid.

this ruling ran contrary to a Māori perspective. However, it may be that this court action contributed to Lake Waiorongomai still existing. By contrast, the damage to Lake Kahuwera has been significantly reduced in size and can currently be described as a small, swampy area covered in raupō, with very little open water.

Ownership and values were further contributing factors to the near extinction of Lake Kahuwera while Lake Waiorongomai still exists today. Lake Waiorongomai Block 10 and surrounding blocks remain in Māori ownership where as Lake Kahuwera and its surrounding blocks do not (Figure 3.1.11). Selwyn Simcox sold Waiorongomai Block 7 to Mr A.D. Webster in 1934.[390] After changing hands several times it was repurchased as 7A, 7B and 7C in 1978 by Mr A.H. Keelan[391] a grandson of W.H. Simcox[392] and the ancestor of the current owner, David Keelan.

Another Pākehā whakapapa connection is the current leasee of Waiorongomai Block 1A - Kathy Simcox (nee Monk) who married into the Simcox family, who still farm and live locally in the Ōtaki area.

[390] Farthing, 1978, p. 15.
[391] Spelt in the journal article as Keeling.
[392] Farthing, 1978, p. 22.

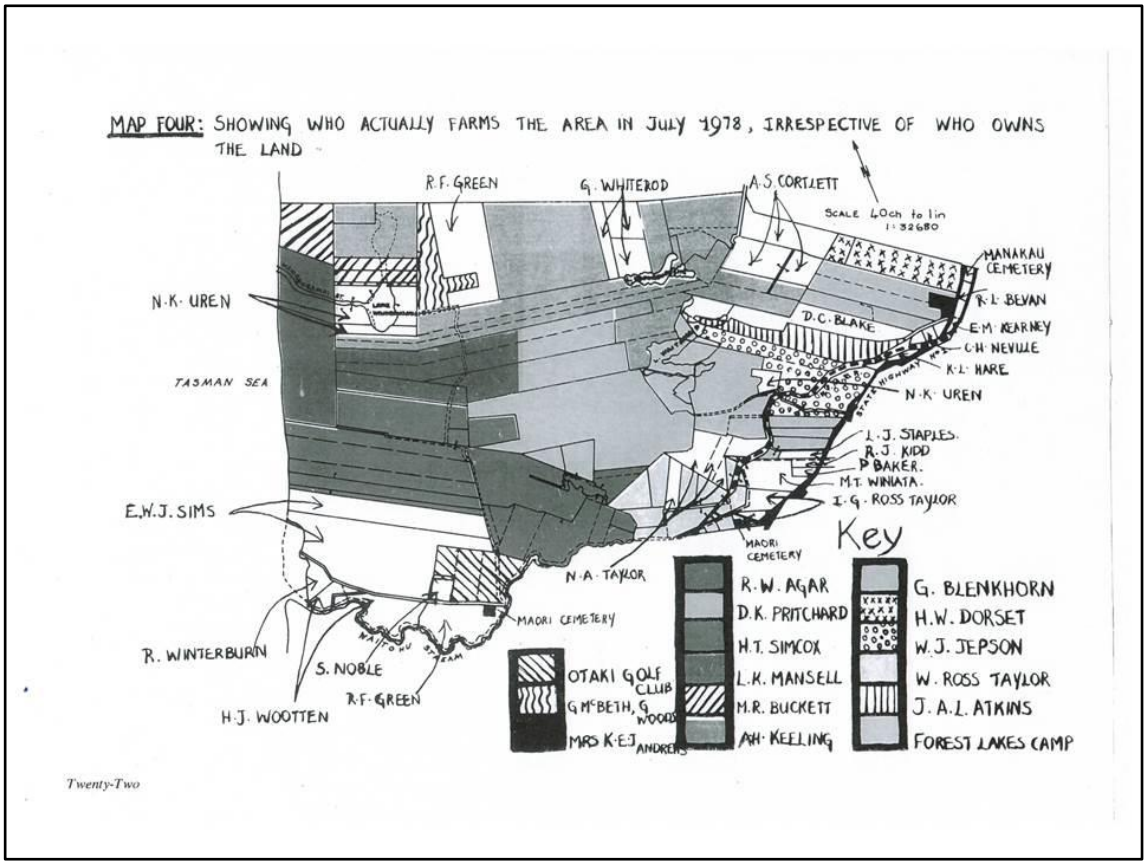


Figure 3.1.11 Waiorongomai and Pukehou Blocks farming whānau in 1978. *(Source: Farthing, B., 1978, p. 22)*

The subdivision of the 10 Waiorongomai blocks resulted in further severing of whānau ties as more of the smaller blocks were sold into pākehā ownership, evident in a 1978 map (Figure 3.1.12). This map also shows that a considerable amount of the Waiorongomai Block remained in Māori ownership, whereas the Pukehou Block had largely been sold. Rupene Waaka researched the Māori land ownership status for the original Waiorongomai Block (1963 acres) for Blocks 9 and 9A. This research was undertaken as part of the Maiotaki hui[393] held on 11 January 2014. His results showed that the 3 hapū and 26 owners (in 1869) had grown to 1,755 hapū members[394] still owning 17 of the subdivided Waiorongomai Blocks.[395] The blocks that remained in hapū ownership included: Waiorongomai 1A, 2, 3A, 3B1, 3B2, 3B3, 4, 7D, 7E, 7F, 8A,

[393] Meeting, gather.
[394] Although some owners will be duplicated and feature in other land blocks.
[395] Waaka, 2014b, Slides 24 and 26.

8B, 8F, 9A, 10, A, B (Figure 3.1.13).[396] The amount of land in these 17 blocks amounted to 1066 acres, approximately 54% of the total land area of the original 1869 Waiorongomai block.[397] Comparatively the Māori land ownership today evident in the Waiorongomai and Pukehou Blocks shows a similar result to that in 1919 (Figure 3.1.9) 57% (i.e. 2,388acres of the 4,203acres discussed earlier).

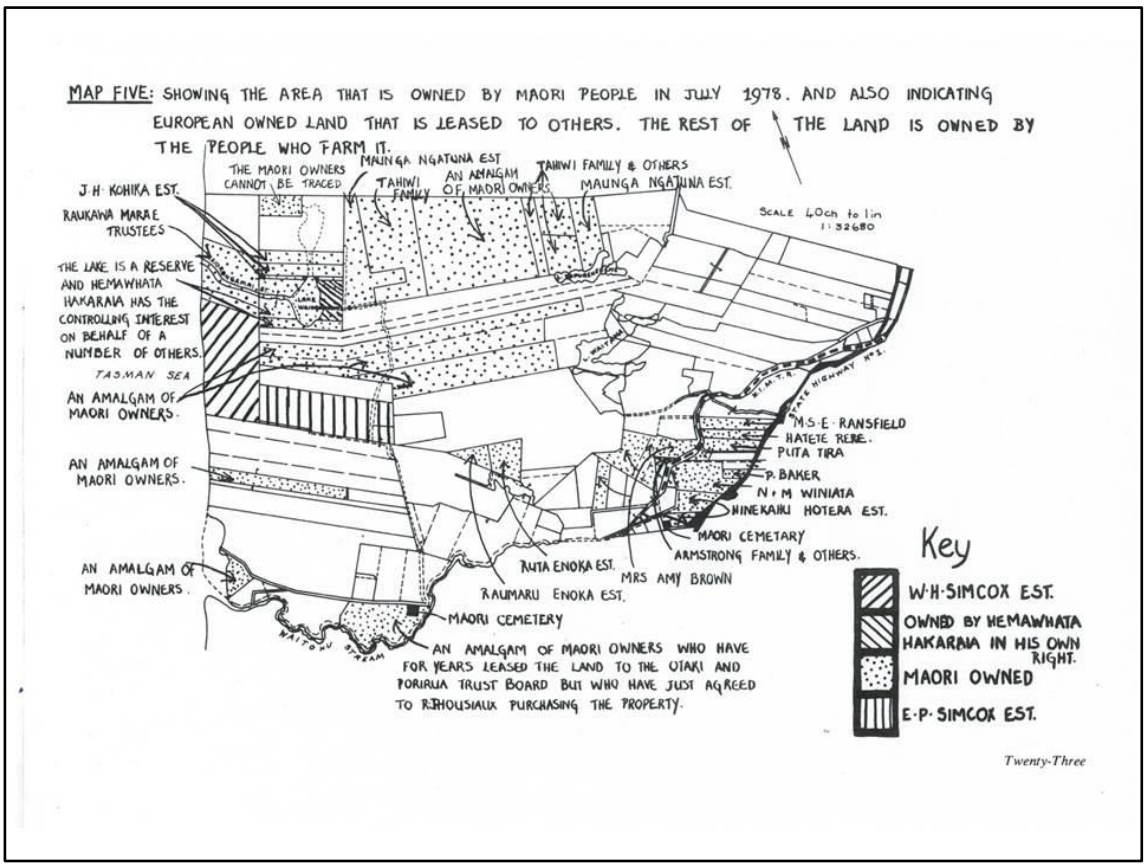


Figure 3.1.12 Waiorongomai and Pukehou Blocks showing Māori ownership in 1978. (Source: Farthing, B., 1978, p. 22*)*

[396] Ibid, Slide 24.
[397] Ibid, Slide 25.

Figure 3.1.13 Waiorongomai Blocks showing Māori ownership in 2013. *(Source: Waaka, R., 11 January 2014, Presentation Slide 29. Original Source: Te Kooti Whenua Māori-Māori Land Court Website image captured by Cnes/Spot Image, Digits Globe, Horizons Regional Consortium, Horowhenua District Council, Kāpiti Coast District Council, Landsat)*

3.1.4 The restoration of whānau relationships at Lake Waiorongomai

A 1993 Ōtaki Historical Society Journal article mentioned Lake Waiorongomai.[398] It was written by Meretini Wipiti, who was born in 1925 in her mother's home on the corner of Aotaki Street and Raukawa Street in Ōtaki. She reminisced of earlier times growing, gathering and eating from local gardens, orchards and the surrounding lands, waterways and beaches. The following quote shows the connection local Ōtaki whānau had with Lake Waiorongomai and the resources obtained there.

> …our school holidays were spent at Waiorongomai Lake, out past the Ōtaki Golf Links, setting nets to catch eels, gathering pipis, toheroas from the beach which were cooked dried and preserved for our welfare cupboard[399] throughout the winter. We stayed at the lakeside a week or two: each family had their

[398] Wipiti, M., 1993, Our heritage was love at home, p. 45.
[399] "Pātaka." R. Waaka, personal communication, 20 November 2017.

> own whare or baches made of ponga fern trees. Rabbits were trapped around the area, which we enjoyed in stews, stuffed and baked – our favourite dish. We had a wonderful time fishing, collecting seafoods, swimming at the beach, but it was not all play, for this was a time when we were helping in preparing for our winter food stores. Manuka wood was collected each week around the Lake by our Papa(father) and brothers. 'Hape', our faithful old horse who worked hard, carted our wood home which was the only transport we had and enjoyed.[400]

Horiana Joyce also wrote an article for the Ōtaki Historical Society Journal on a Ngāti Maiotaki hapū hui that celebrated whanaungatanga.[401] This event took place at Raukawa Marae over the Wellington Anniversary Weekend 22nd to 25th of January 1999. During this hui, Ngāti Maiotaki attendees learnt about number of important points of value to their hapū such as:

> (i) their kin connections to the families of Ōtaki and other sub-tribes; (ii) the location of and detail about whenua (land) held by Ngāti Maiotaki people; (iii) the opportunity for children of Ngāti Maiotaki to meet and share time enjoying activities particularly designed for them; (iv) gathering information and strengthening networks of the people of Ngāti Maiotaki; and (v) enjoying and sharing the gifts and company of Ngāti Maiotaki people.[402]

[400] Wipiti, 1993, p. 45.
[401] Joyce, H., 2000, Ngāti Maiotaki hapū hui, pp. 24-25.
[402] Ibid, p. 24.

The whānau and hapū members also walked their land and trekked from Lake Waiorongomai through to Lake Kopureherehe[403]. At that hui, Horiana noted that some whānau were visiting for the first time, while others were re-visiting.[404] Overall her account mentioned the hui being an 'unqualified success', and in particular the children's programme where the children visited a nearby creek to explore the wild life.[405,406] Horiana finished her article with a ballad composed by Kingi Tahiwi, a Ngāti Maiotaki composer that described the hapū geographical location and highlights the importance of spiritual connections and future generations.[407]

"Tau Mai e Kāpiti

Whakataretare mai ki te rangatahi e aho nei e …

We salute you, Kāpiti!

Gaze upon the youth who gather here.

Kingi Tahiwi"[408]

Waiorongomai Block 1A is now also managed by an Ahu Whenua Trust (Waiorongomai 1A Trust) on behalf of all the owners. It is administered through the Māori Trust Office, with the Māori Trust Office appointed trustee (Māori Trustee) as the responsible trustee on 6th of June 2000.[409] In April 2008, trustee Nick Albert enquired to the Māori Trustee on behalf of the whānau who had expressed an interest in

[403] Also known as Forest Lakes.
[404] Joyce, 2000, p. 25.
[405] This format and agenda has continued and is similar to the wānanga events that occurred in the LWRP wānanga discussed in further detail in Chapter 5 & Chapter 6.
[406] Joyce, 2000, p. 25.
[407] Ibid.
[408] Ibid.
[409] Material provided with permission for use by Kaumātua and Waiorongomai 1A Trustee, Nick Albert 19 November 2012, a copy of a Māori Trust Office Letter dated 30 April 2010 and a copy of the Report to Owners Waiorongomai 1A prepared by the Maori Trustee (Mere Whanarere).

regards to fencing the Waiorongomai Stream that runs through their land block.[410] The Māori Trustee at the time (Nanette Puohotaua) wrote back in June with the details of the KCDC Riparian Fund.[411] Nick Albert went on to enquire with KCDC, GWRC and the Waiorongomai Lake 10 Trust Chairperson (Jimmy Nicholls) to promote the interest of riparian planting and fencing along the Waiorongomai Stream.[412] These actions show that whānau and hapū of Waiorongomai, including the surrounding Māori land owners, have had keen interest in restoring the lake's wellbeing for many years.

GWRC funding supported early whānau and hapū initiatives to pursue the restoration of Lake Waiorongomai. On 19 April 2009, Te Waari Carkeek, Chairperson of Te Rūnanga o Raukawa held a Lake Waiorongomai Restoration Meeting at Taaringaroa that had an attendance of 25 interested persons.[413] It was noted in the minutes that GWRC had approved funding for a restoration project at Lake Waiorongomai and that Ngā Whenua Rāhui Chief Executive and staff member Richard Andersen had also visited the lake to offer advice and assistance.[414] A number of Lake Waiorongomai Restoration Meetings followed (2009-2010) showing a strong interest by the whānau and hapū present that led to a strategic plan as well as draft mission and vision statements.[415]

Draft vision statement

"Lake Waiorongomai will always be there for our uri[416] of Raukawa."[417]

[410] Ibid,, a copy of his letter to the Responsible Māori Trustee (Nanette Puohotaua) Letter dated 22 April 2008.
[411] Ibid, a copy of the Responsible Māori Trustee (Nanette Puohotaua) Letter dated 16 June 2008 and a copy of the Kapiti Coast District Council Biodiversity Coordinator (Braden Rowson) Letter dated 16 May 2008.
[412] Ibid, a copy of his Letter to his sister Jean undated but listed chronologically in his file.
[413] Ibid, a copy of the Lake Waiorongomai Restoration Meeting Minutes 19 April 2009.
[414] Ibid, a copy of the Lake Waiorongomai Restoration Meeting Minutes 19 April 2009, pp. 4-5.
[415] Te Rūnanga o Raukawa Inc., 2011. (unpublished report)
[416] Descendants.

Draft mission statement

"Restoration of Lake Waiorongomai to:

- a more healthy condition,
- a sustainable condition,
- by protecting the Lake,
- ensure that both Waiorongomai and Lake Kahuwera are restored."[418]

Kaumātua and kuia had a dream to restore Lake Waiorongomai as they remember the lake when they were young as their summer playground, a place of harvest full of life, and with pristine clear waters. During this initial phase of identifying issues and possible restoration measures, Queenie Rikihana conducted a number of oral interviews that reflected on the memories of Lake Waiorongomai whānau members (Appendix 1).[419] Kaumātua and kuia including Borgia Hakaraia, Retitia (Betty) Raureti, Jimmy Nicholls and Erna (Lillian) Winterburn-Somers were very passionate supporters of the revitalisation efforts. It is appropriate here to acknowledge those who passed on to the heavenly realm during the writing of this thesis and to express great gratitude from the author for their support, direction and precious memoirs.

3.2 The state of environment at Lake Waiorongomai prior to the initiation of restoration initiatives in 2012

Given the rapid emergence of a Pākehā cultural landscape upon the Waiorongomai land block, is it possible for: (i) the whānau relationships that form the basis of Māori cultural wellbeing to be restored; and (ii) Pākehā and Māori models of

[417] Lake Waiorongomai Restoration Meeting, 14 June 2009, Te Runanga o Raukawa Inc., Otaki, Meeting minutes, p. 2. Cited in Te Rūnanga o Raukawa Inc., 2011. (unpublished report)
[418] Ibid.
[419] Te Rūnanga o Raukawa Inc., 2011, Attachment 2. (unpublished report)

'cultural landscape' and 'ancestral landscape' to find some way of co-existing? The legacy of Pākehā settlement of the Horowhenua region is not one that is based on a shared co-existence of worldviews. Rather, colonisation led to a period of severe decline in te reo Māori and the expression of local tikanga, which also affected the previously strong ancestral ties with Te whānau a Ranginui rāua ko Papatūānuku.[420] The adverse impact of colonisation on whānau, hapū and iwi who whakapapa to Lake Waiorongomai has been documented in the report '*Whakatupuranga Rua Mano – Generation 2000'*.[421] By contrast, little has been published about the adverse impact of colonisation on Lake Waiorongomai and surrounding landscapes.[422] This doctoral thesis and specifically this final sub-section of Chapter 3 seeks to correct this imbalance.

3.2.1 Geological context

The geological history of the Horowhenua plain – including the land surrounding Ōtaki and the dune lake named Waiorongomai – is described by F.S. Simcox. According to Simcox, the plain formed approximately 2 million years ago by an elevated rise of the land by several hundred feet.[423] Numerous river and stream systems took rainfalls on the mountains towards the sea by meandering across the coastal plains with their wet swampy area.[424] In the case of the Waikawa and Ōtaki, these rivers transported gravel predominantly to the land in the general plain, which contributed to the creation of rich alluvial soils.[425] By contrast, the region around Lake Waiorongomai

[420] A. Cole, Personal communication, 11 February 2016.
[421] Winiata, 1979, pp. 1-9.
[422] Notably a book has been written dedicated to a Waiorongomai block in the Wairarapa district. Thornton, L., 1949, Waiorongomai: The land and the people. Other than it being a different location the book also only details the European owners and their associated stories.
[423] Simcox, 1952, p.13.
[424] Ibid.
[425] Ibid, p.14.

is reported by Dreaver to be coastal sand and peat country (Figure 3.2.1).[426] Following these land-forming events, the coastal platform then subsided for an unknown time span and then rose again in the Pleistocene period, an event that resulted in the sea level retreat.[427] Thus, the landscapes and waterscapes in this coastal area evolved over millions of years.[428]

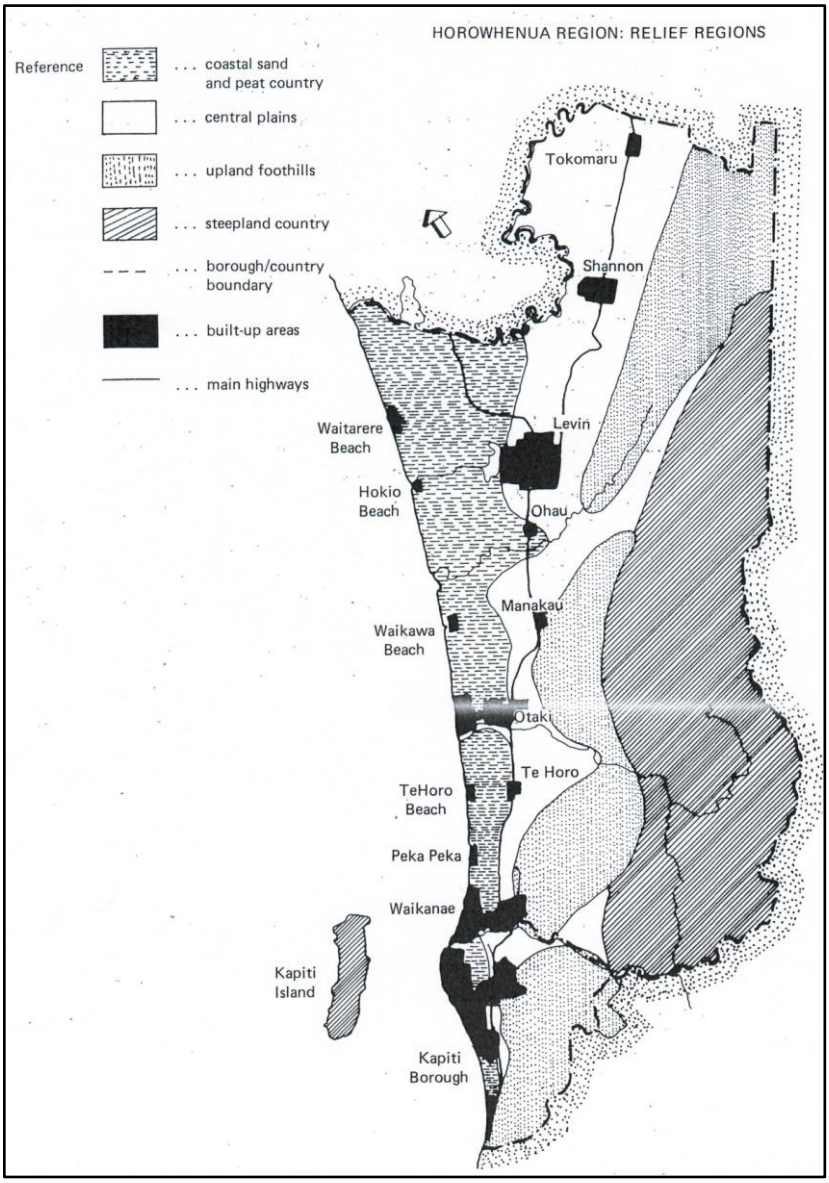


Figure 3.2.1 Kāpiti-Horowhenua coastal soil relief *(Source: Dreaver, A., 1984, p. 13)*

[426] Dreaver, A., 1984, Horowhenua County and its people: A centennial history, p. 13.
[427] Simcox, 1952, p.13.
[428] Golubiewski, N., 2012, Ecosystems services inventory of the natural and managed landscapes within the greater Ngāti Raukawa area, pp. 3-4.

In 1950, Francis Simcox described the early landscape of the Forest Lakes property (which included Lake Waiorongomai), that his family had farmed since the late 1800s. The scene he portrayed included a reference to:

> four lagoons, all bordered by sand hill country or swamps, three lakes, bush-bordered in parts, and sundry water holes and swamps. The eastern sides of the three Lakes are of clay and sandstone formation and are much older, geologically, than the blown sand on the western sides. The largest lagoon is Waiorongomai, 25 acres, and is about 14 chains from Kahuwera, both of these being near the north west corner of the property.[429]

Simcox referred to Ngātotara and Waimangungu lagoons, along with Lake Waitawa, Lake Potakataka and Lake Kopureherehe. He also noted that drainage was referred to as a common practice, which suggests that Lake Kahuwera was likely to have been affected by activities of this kind.

3.2.2 Archaeological context

Archaeologist Bruce McFadgen writes of two Māori cultural and archaeological periods in the Horowhenua region, an early and a late period, separated by the advance of the 'Old Waitarere Dunes'.[430] McFadgen quoted a 1994 Department of Conservation publication that states "the Kapiti-Horowhenua region is the southern part of the dune

[429] Simcox, 1960, pp. 6-7.
[430] McFadgen, B., 1997, Archaeology of the Wellington Conservancy: Kāpiti-Horowhenua: A prehistoric and palaeoenvironmental study, p. 5.

belt that borders the southwest coast of the North Island".[431] Understanding the 'on-site' stratigraphy (i.e. the layered record of pits, postholes, middens etc) allows archaeologists like McFadgen to estimate dates of early Māori occupancy, the location of dwellings, as well as where people collected food and raw materials.[432] At the time of McFadgen's 1997 publication, he stated that no archaeological evidence had been collected at Lake Waiorongomai or its surrounds by the NZ Archaeological Association Site Recording Scheme.[433] Although whānau and hapū were aware of midden and papakāinga sites in and around the Lake Waiorongomai restoration project, they preferred that these areas to be left alone and not disturbed.[434] Thus archaeological evidence was not included as part of this doctoral research.

3.2.3 Hydrological context

Prior to the restoration project, minimal research and data existed on the condition of Lake Waiorongomai. This was a "major source of concern to the Lake Waiorongomai Land Block 10 Trust Board, Waiorongomai Whakapapa Whānui Hapū, Raukawa Iwi and the owners of the surrounding land"[435] Historical water quality testing was the only known recorded monitoring conducted prior to this doctoral research. The water quality monitoring that included Lake Waiorongomai was conducted by the Manawatu Regional Water Board in 1976-1977 and was very limited in extent and frequency.[436] The results are summarised in Table 3.2.1. Comparing these historic freshwater indicator results against the New Zealand National Policy for Freshwater Management indicator set (established by the Ministry for Environment), the Lake Waiorongomai freshwater ecosystem appeared to be in a healthy state at that

[431] Cited by Ibid, pp. 5-6.
[432] McFadgen, 1997, pp. 6-7.
[433] Ibid, p. 7.
[434] T. Carkeek, personal communication, 3 April 2010.
[435] Te Rūnanga o Raukawa Inc., 2011, Attachment 19. (unpublished report)
[436] Manawatu Regional Water Board, 1976-1977, Water quality surveys. (unpublished report)

time.[437] A comparison between this historical data (Table 3.2.1) and current aquatic baseline monitoring results is presented and discussed in Chapter 7. Water is an essential element in the continued existence of dune lakes and wetlands. Water quality is thus a very important ecological indicator in restorative projects.[438] Measuring water quality was therefore included in baseline ecological monitoring conducted in this doctoral research (Chapter 7).

Table 3.2.1 Lake Waiorongomai water quality monitoring 1976-1977.[439]

Date	**Time HR**	**Water Temp ^{o}C**	**Total P mg/L**	**NO_3-N mg/L**	**DO mg/L**	**Secchi M**	**Comments**
04/08/76	1215	8.9	0.23	0.04	12.5	0.30	Shallow lake. Water a very peat red-brown colour.
08/09/76	1320	13.2	0.2	0.09	14.0	0.22	Shallow. Turbid.
21/10/76	1330	20.5	0.789	0.07	10.8	0.3	Shallow. Very brown coloured water.
8/12/76	1240	23.8	0.14	0.01	13.8	0.3	Shallow. Dark peaty-brown colour. Weedy on littoral regions.
19/1/77	1300	16.9	0.19	0.07	8.3	0.7	Water looks very turbid, brownish coloured.
16/3/77	1220	18.3	0.33	0.08	9.9	0.3	Turbid from suspended solids.
18/5/77	1300	7.1	0.51	0.07	11.8	0.15	Fairly well mixed, turbid from suspended solids.

(*Source: Manawatu Regional Water Board, 1976-1977, Water quality surveys. (unpublished report)*)

The water quality at Lake Waiorongomai has been – and to a certain extent continues to be – affected by surrounding farming practices based on the near proximity and direct access of cattle (Figure 3.2.2), drainage and removal of native vegetation. The Resource Management Act 1991 requires farmers to fence off all waterways to prevent contamination by cattle. A number of factors can contribute to this not be followed

[437] Ministry for the Environment, 2017, National policy statement for freshwater management 2014 (updated August 2017 to incorporate amendments from the national policy statement for freshwater amendment order 2017), Appendix 2, pp. 30-40.
[438] GWRC, 2005, Understanding the 'wet' in wetlands: A guide to the management of freshwater wetland hydrology, p. 3.
[439]

through by farmers, such as the cost of fencing, a low understanding of the impacts of effluent on aquatic ecosystems, and attitudes resisting change. An important question to consider when restoring a wetland is how the hydrology operated prior to human intervention in this ancestral landscape and just what this understanding might imply in terms of fencing and restoration options. A key aim of fencing is to exclude livestock from the wetland and lake. Careful consideration of fence design and placement is critical to ensure the erection of a fence structure will not be adversely affected by movement in surface water, the water table and soils.

Figure 3.2.2 Photograph of cattle in Lake Waiorongomai *(Source: Rupene Waaka taken 15th February 2013)*

An improved understanding of local hydrology will also assist in characterising the exact nature of surface water features. Three important characteristics of a wetland: (i) the presence of water (e.g. an elevated water table); (ii) water logged soils (low in oxygen due to intermittent or permanently being saturated with water); and (iii) wetland

plants (which have adapted to wet soils or immersion in water).[440] Wetlands – as described by the GWRC – fall into eight different categories: ephemeral wetland; bog; fen; marsh; swamp; seepage; shallow water; and pakihi/gumland.[441] Many of the wetlands that once surrounded Lake Waiorongomai were ephemeral and appeared annually in winter.[442] Kaumātua such as Te Waari Carkeek remember the Waiorongomai Stream having a wide reasonable flow that did not dry up in summer as it does now.[443]

The river systems and river mouths along the Kāpiti Coast and Horowhenua region move location on a fairly regular basis. At times, the Waikawa River mouth got very close to the outlet of the Waiorongomai Stream before council constricted its movements by flood control mechanisms (e.g. stop banks). The map in Figure 3.2.3 illustrates the movements of the Waikawa River mouth from 1842 to 1980.[444] The aerial photograph in Figure 3.2.4 is taken on the 11th of February 1942.[445] Note that Lake Kahuwera in this photo is largely reduced from its original size (e.g. Figures 3.1.4 and 3.1.6). Another landscape feature is the sand blown in areas behind the coastal sand dune area caused by deforestation and the impact of wind.

[440] Adapted from GWRC, 2005, Understanding the 'wet' in wetlands: A guide to the management of freshwater wetland hydrology, p. 3.
[441] GWRC, 2005, Understanding the 'wet' in wetlands: A guide to the management of freshwater wetland hydrology, p. 30.
[442] T. Carkeek, personal communication, 11 November 2011.
[443] T. Carkeek, personal communication, 2 February 2011.
[444] Averes, R., 1982, History of Waikawa Beach, Otaki Historical Society Journal, Volume 5, pp. 80-81.
[445] Crown Copyright that requires the referencing of the source to Land Information New Zealand the photo is also accessible for viewing on the Kete Horowhenua website http://horowhenua.kete.net.nz

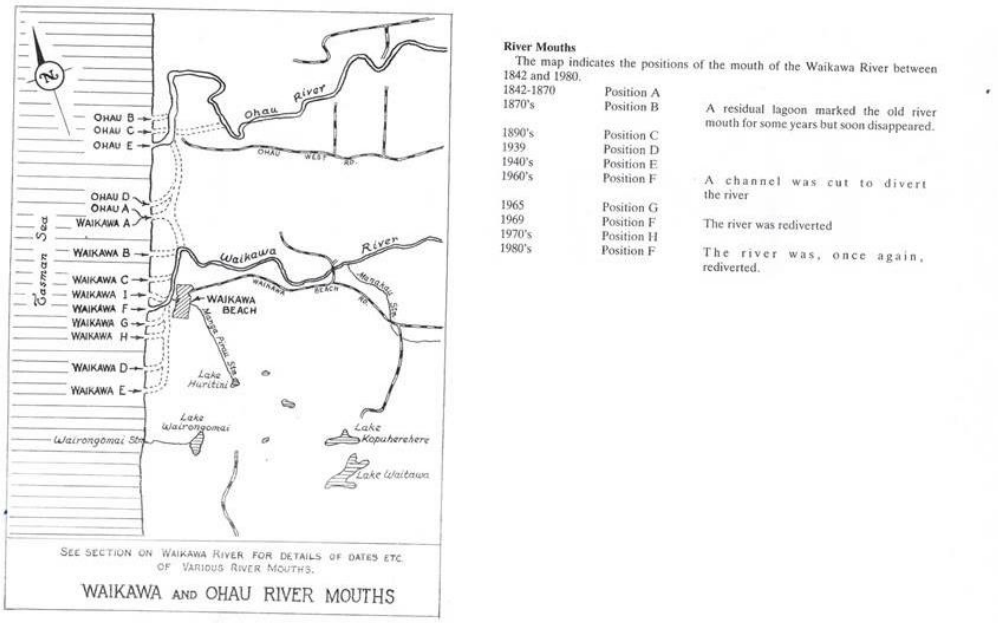


Figure 3.2.3 Waikawa River mouth movements 1842 to 1980. *(Source: Averes, R., 1982, pp. 80-81.)*

Figure 3.2.4 Waikawa River mouth and Lake Waiorongomai, 1942, taken by N.Z. Aerial Mapping Ltd, Hastings. *(Source: Land Information New Zealand (LINZ) and licensed by LINZ for re-use under the Creative Commons Attribution 3.0 New Zealand License.)*

A common farming practise that seriously affects wetland ecosystems is draining. At Waiorongomai, draining activities were responsible for destroying the surrounding ephemeral wetlands by removing water, which affected local flora and fauna. The draining practice started in 1920 and was recorded in the Native Land Court minutes.[446] The details of this Court proceedings is described in sub-section 3.1. The effects of this northern drain significantly decreased the size of Lake Kahuwera.[447,448] The drains entering Waiorongomai were also considered by local whānau to be a potential source of contamination.

Figure 3.2.5 Photograph of northern drain and cattle entering the lake *(Source: Rupene Waaka taken 7th February 2003)*

[446] NLC OMB 55, 1920, p. 213. Cited in Waaka, 2014a, Slide 18.
[447] T. Carkeek, personal communication, 13 November 2011.
[448] Evidenced by comparing early maps in Figures 3.1.1, 3.1.4, 3.1.6, 3.1.7 with later more recent Figures 3.1.2 and 3.2.4.

In the 1970s, local whānau agreed to allow the leasee to cut a new stream outlet for Waiorongomai Stream, approximately 40 metres to the south of the original position.[449] This action was intended to increase the pasture for grazing purposes (Figures 3.2.6 and 3.2.7). This reduced the water level to approximately 0.5 metres which led to the destruction of the ephemeral wetlands surrounding the lake. Reduction of the ephemeral wetland created a permanent lake edge observed at the start of the restoration project in 2012. The original height of the Lake can still be derived from the carex sectar grass as the base of their leaves burst out from above the old lake level.[450]

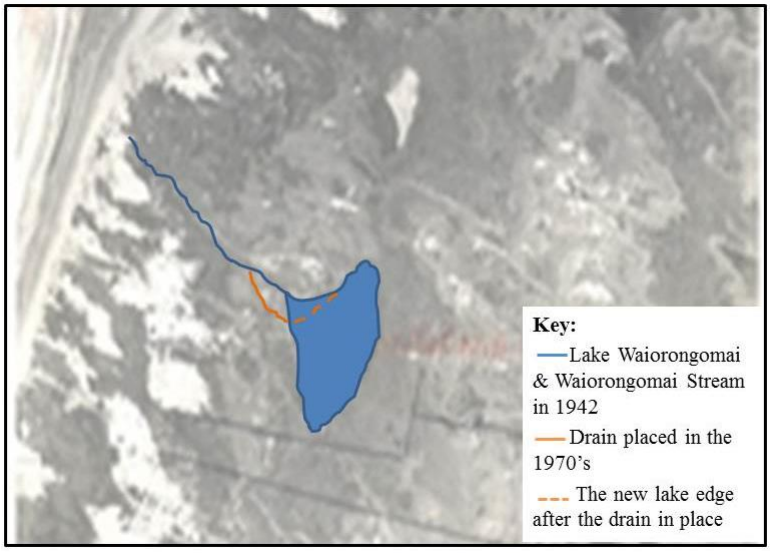


Figure 3.2.6 Lake Waiorongomai Aerial Photo 1942 with location of 1970's drain. *(Adapted from the original photograph refer to Figure 3.2.4. Original source: Land Information New Zealand (LINZ) and licensed by LINZ for re-use under the Creative Commons Attribution 3.0 New Zealand License.)*

[449] T. Carkeek, personal communication, 11 November 2011.
[450] T. Park, personal communication, 11 November 2011.

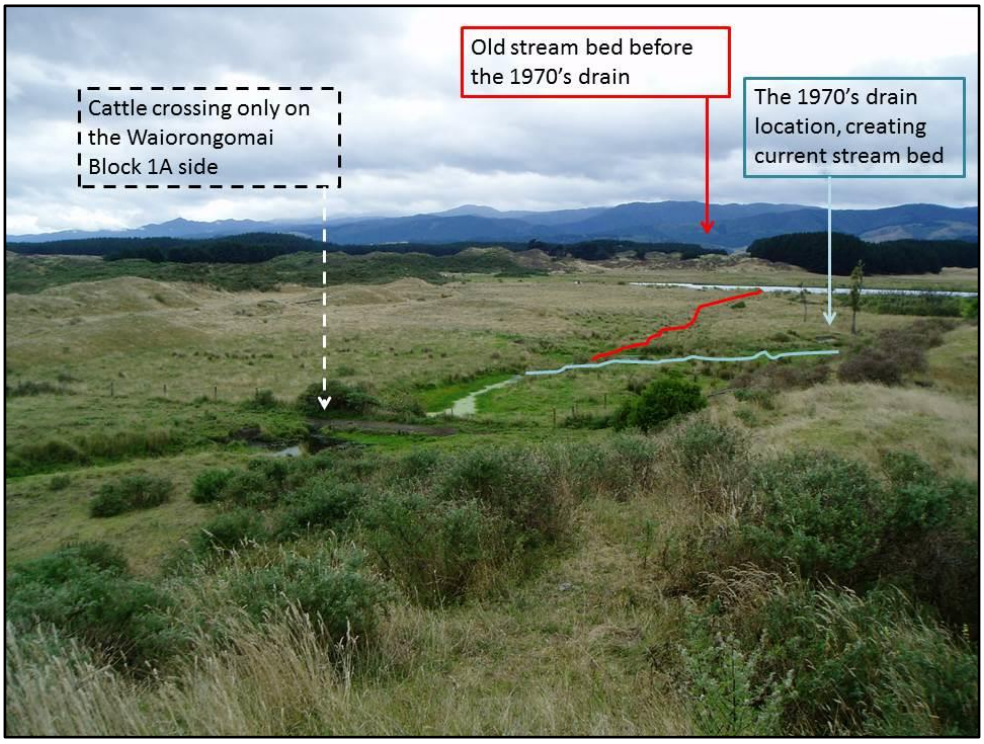


Figure 3.2.7 Waiorongomai Stream and the location where the 1970's drain changed the direction of the stream. *(Source: Adapted with photograph by Aroha Spinks taken 21 February 2014)*

3.2.4 Oral history as a form of proxy monitoring data

This sub-section draws on the details of the historic conservative fishing and gathering methods at Lake Waiorongomai provided by Mr Miki Rikihana in the *'ART Iwi Fisheries Claim Report'*.[451] He comments that each whānau and hapū knew their area and did not transgress the areas of other whānau and hapū. The main kaimoana species that were gathered, dried and smoked during the use of the papakāinga at Lake Waiorongomai were: tuna[452], tohemanga[453], pipi[454], kahawai[455], kanae[456], tamure[457] and mako[458].

[451] Ngā Kaitiaki o Raukawa, date unknown, pp. 83-85. (unpublished report)
[452] Also known as eel, *Anguilla dieffenbachia* and *Anguilla australis*.
[453] Also known as toheroa and *Paphies ventricosa* by New Zealanders and other iwi. Ngāti Raukawa ki te Tonga iwi and hapū describe tohemanga and toheroa as being very similar but explain that there is a colour difference in the shells of the two species. Tohemanga was the species most in abundance on this coastline, according to our tūpuna.

Pā tuna[459] were also established in these waterways for holding eels, and Mr Rikihana describes their construction and the locations of them on the map he drew (Figure 3.1.2). The eels at Lake Waiorongomai were, according to Māori classification, of the Puhi variety between 0.75 to 1.5 metres long. [460] Notably the late kaumātua goes on to mention the 'small type of shrimp' that the eels feed on in Lake Waiorongomai and Lake Kahuwera. Kaumātua today still refer to the delicious eels they ate from this location and believed the quality of this delicacy to be due to the existence of a shrimp diet.[461] The shrimp are found in the lake today. This topic is discussed again later in the ecological monitoring section (Chapter 7) of this thesis.

As a child, Mr Rikihana recollected gathering kaimoana along with his whānau.[462] He continued this practice into his later years, while also teaching younger generations. He described the historic tuna heke 'eel runs' during the wet season and observed that, more recently, numbers were declining. However, he still recorded a recent catch of 150-200 eels for the wedding of Rangi and Ellen Nicholson in February 1988. [463]

The earliest known video footage at Lake Waiorongomai was taken about 1978 of Queenie Rikihana's dad (Miki Rikihana Senior) attempting to pull a hīnaki[464] of over 200 eels.[465] According to Queenie he was in his 50s maybe 60s and struggling to pull the set in, due to the weight of the eels. Her memories were that at that time, when her

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[454] Also known as *Paphies australis*.
[455] Also known as *Arripis trutta*.
[456] Also known as grey mullet and *Mugil cephalus*.
[457] Also known as snapper and *Pagrus auratus*.
[458] Also known as shark species.
[459] Eel weirs.
[460] Ngā Kaitiaki o Raukawa, date unknown, p. 83. (unpublished report)
[461] T. Carkeek, personal communication, 13 November 2011.
[462] Ngā Kaitiaki o Raukawa, date unknown, pp. 83-85, 121-122. (unpublished report)
[463] Ibid, p. 84.
[464] Eel trap.
[465] Q. Rikihana, personal communication, 2 Novbember 2016.

dad used to go to Lake Waiorongomai to set hīnaki with Wiremu Kingi, the eel population was abundant. Queenie still holds on to that treasured footage.

In the kaumātua interview section of the *'ART Iwi Fisheries Claim Report'*, Miki Rikihana mentions that some eels were thrown back into the Lake at Waiorongomai according to custom, along with golden and silver perch.[466] Rupene Waaka has video and photographic evidence of a small silver fish caught in his hīnaki on 10 April 2011 (Figure 3.2.8). Rupene Waaka also provided a photo of Uma Carkeek and his mullet catch on 11 February 2006 (Figure 3.2.9).

Figure 3.2.8 Photo of unknown exotic fish (possibly silver perch) caught in hīnaki set at Lake Waiorongomai. *(Source: Rupene Waaka taken 10th April 2011)*

[466] Ngā Kaitiaki o Raukawa, date unknown, pp. 119-122. (unpublished report)

Figure 3.2.9 Photo of Uma Carkeek with mullet caught in Lake Waiorongomai. *(Source: Rupene Waaka taken 11th February 2006).*

The primary food harvesting goal of our tūpuna was tribal sustenance, however kaimoana was also bartered in a form of manaakitanga[467] that some Pākehā refer to as 'commerce'. In the kaumātua interview section of the *'ART Iwi Fisheries Claim Report'* Mr Enoka (Uncle Guvvy) mentions that the eels caught during the wet season used to travel across "the land from the Waitohu River or the Waiorongomai and Ngatotara Lakes and (many) were caught (at) many times while crossing the land."[468] He remembered Ngāti Kapu sending some of these captured eels off to relations in Rotorua. Miki Rikihana mentions this too in his interview, and states that "the Waiorongomai Lake was associated with Waihurihia, Koroki, Maiotaki and Pare. He also said that certain families were associated with different pā tuna[469] (Figure 3.1.2).

[467] Hospitality.
[468] Ngā Kaitiaki o Raukawa, date unknown, p. 120.
[469] Eel weirs.

That is, spots along the rivers and creeks were reserved for certain families".[470] Mr Rikihana also reminisced tohemanga being traded for goods such as piupiu[471].

Throughout the eleven kaumātua interviews in the *'ART Iwi Fisheries Claim Report'*, there are common themes and many references to traditional fishing practices and tikanga that relate to spiritual aspects, and conservation, including complete utilisation and distribution of the catches to the wider community. One relevant quote by Mr Bob Rore stated:

> the Maori people were not wasteful. Any kaimoana they had left over was shared, or dried and eaten later. It must be remembered that the Maori fishermen were not fishing just for themselves, but for the whānau-whānui[472]. They had their own children to think of, but they also fished for their elders and other members of the hapū.[473]

In Mr Rore's experience, "the Maori people of the area did not sell their fish. They did, however, use them for barter. Fish were swapped for other things that the people might need."[474]

Kākahi[475] is an important traditional food source found in Lake Waiorongomai and other local coastal dune lakes and streams. This species is considered to be "the most powerful filtering freshwater mussel in the world" by Hannah Rainforth.[476] Kākahi are in major decline nationwide due to factors such as water quality decline, high nutrient

[470] Ibid, p. 121.
[471] Waist-to-knee garment made of flax.
[472] Wide, extended family.
[473] Ngā Kaitiaki o Raukawa, date unknown, p. 125.
[474] Ibid, p. 126.
[475] Also known as freshwater mussel and *Echyridella menziesii*.
[476] Rainforth, H., 2008, Kākahi – the mysterious Freshwater Mussel report. Cited in Te Rūnanga o Raukawa, 2011, Attachment 11. (unpublished report)

levels, low water levels, increased siltation, and their unusual reproduction technique of using host fish species to transport their larvae.[477] Local whānau and hapū were concerned about the kākahi population in Lake Waiorongomai as in recent years their kaumātua (e.g. Uma Carkeek and brother Mickey Carkeek) could no longer find any in their traditional gathering area."[478]

3.2.5 The detrimental impact of farming practices

The loss of native plant species around the lake edges and stream is due to farming practices clearing remnant vegetation. The whānau were disheartened by these common farming practices of creating drains and burning native plants to increase grazing land (Figure 3.2.10 and Figure 3.2.11). They made their concerns known to the leasee of Waiorongomai 3B2 who had responsibilities under the 1991 Resource Management Act to fence off and no longer contaminate waterways. Given the leasee only had the three paddocks surrounding Lake Waiorongomai, and no access to electricity, the arduous task of fencing off Lake Waiorongomai was an expensive prospect.[479] Unfortunately this made communication and negotiations with the leasee difficult (discussed in detail in the next sub-section). The leasee was fined by GWRC for the drains he created in the 1990s.[480]

[477] Ibid.
[478] M. Carkeek, 10 December 2014, personal communication.
[479] With electricity available a two wire electirc fence would be effective. However, without electricity an eight wire fence with batons and extra posts is necessary to ensure that cows do not push through.
[480] T. Park, personal communication, 13 November 2011.

Figure 3.2.10 Photograph of a drain created in the 1990's by the leasee leading into Lake Waiorongomai *(Source: Rupene Waaka taken 8th June 2002)*

Figure 3.2.11 Photograph of vegetation burnt at Lake Waiorongomai as a farming practice *(Source: Rupene Waaka taken 8th June 2002)*

3.2.6 Change in vegetation cover

Local whānau and hapū traditionally gathered many resources from nearby forests and bush areas. This included gathering edible plants, building materials and materials for garments, and snaring birds etc.[481] The coastal dune and wetland plant species at Lake Waiorongomai have not been researched previously, therefore this doctoral research created a plant inventory that is described in Chapter 7. The closest locally researched vegetation list was compiled by Dr Maggy Wassilieff in 1988 for the Paekakariki-Waikanae area on the Kāpiti Coast.[482] Dr Wassilieff notes that very few native plants remained and reasons for this change included deforestation of the Tararua mountain ranges, conversion to pasture and mammal abuse. She also noted that *Spinifex* and the golden sedge 'Pingao' were main plant binders on the sand dune country. On the back dune areas around Queen Elizabeth II Park she recorded the presence of manuka, taupata, ngaio, cabbage tree (tī), pohuehue, lupin, bracken and flax. At Ngā Manu sanctuary (in Waikanae), a regenerative forest had tawa, kohekohe, mahoe, ngaio and tree ferns. Finally, swampy forest areas she described as 'peat vegetation' were mostly devoid of native plants, however she derived her list from the stumps that remained and noted the dominant tree species as; kahikatea, matai, tōtara, rimu, pukatea, kohekohe, northern rata and manuka and swamp plants (e.g. raupō, rushes and carex).[483]

New Zealand ecologist, Geoff Park wrote about the dramatic impacts on coastal landscapes in Aotearoa by Europeans. He examined four remaining ecosystems, one of these was the local dune coastal lake reserve in Ōhau, Lake Papaitonga (or Lake

[481] Adkin, 1948, p. 30.
[482] Baldwin, O., 1988, The celebration history of the Kāpiti district, p. 251.
[483] Ibid, pp. 249-50.

Waiwiri).[484] Park describes the coastal plains and swamps in the Hororwhenua as having thick forests of kahikatea, pukatea, rimu, hohere, nikau, maire, entangled with the dense underbrush of keikei and karaeo, lake edges of harakeke, manuka and ferns.[485] Associated with this bush scene were an abundance of birds. Kererū – New Zealand pigeons "literally flew in thousands"[486], along with kāhu and hokioi on the hunt, bittern in the swamps and lake edges.[487]

The examination of one of the earliest middens discovered in the area also noted thousands of forest birds such as kererū, kākā, tui and kākāriki along with marine and freshwater fish.[488] Geoff Park noted that another midden site at Lake Papaitonga was thick with kākahi shells[489] as is common alongside the dune coastal lakes of this region.

As described earlier, the Forest Lakes property farmed by the Simcox family in the late 1800s to early 1900s included the Waiorongomai Block and Lake Waiorongomai. In 1950, Francis Simcox described the property as "nearly all sand hill country with native grasses with plenty of fern, manuka scrub, boggy and swampy flats, lakes and lagoons."[490]

George Adkin perhaps took the earliest historic photo of Lake Waiorongomai and Lake Kahuwera in 1931 (Figure 3.2.12). The photograph shows the deforestation that occurred in the region in the late 1880's that removed the larger trees and scrub for industrial, town planning and then pastoral grazing reasons.[491] The loss of indigenous

[484] Park, G., 1995, Ngā Uruora (The groves of Life): Ecology and history in a New Zealand landscape.
[485] Ibid, pp. 169, 173, 176, 181-185.
[486] Early Settler document in the 1800s, cited in Park, 1995, p. 173.
[487] Park, 1995, pp. 182-183.
[488] Ibid, pp. 182-185.
[489] Ibid, p. 181.
[490] Simcox, 1960, p. 6.
[491] Dreaver, A., 2006, The making of a town, p. 31; Wanganui Herald, 9 May 1882, Forest Preservation; Wood, V., *et al.*, 2017, Environmental and natural resource issues report, p. 44.

vegetation in the Lake Waiorongomai area is estimated to be 90-100% since 1900.[492] At the time of the photo Lake Kahuwera was still present as a lake, although the size had already been reduced by drainage. At the start of the Lake Waiorongomai restoration project, Lake Kahuwera was a tiny swamp.

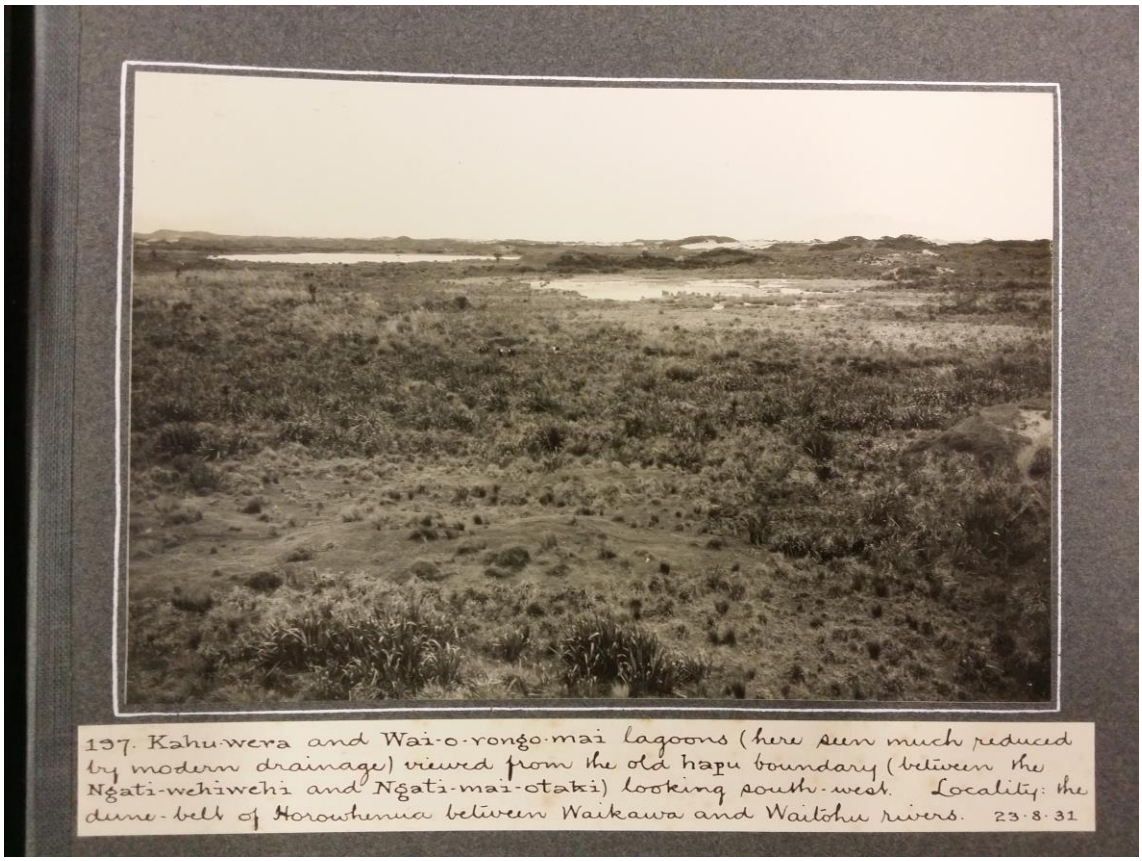

Figure 3.2.12 Historic photograph of Lake Waiorongomai (on the left) and Lake Kahuwera (on the right) *(Source: Alexander Turnbull Library, Adkin Album 13, PA1-q-002-05)*

Another historic photo of Lake Waiorongomai showing the native wetland flora that once was in abundance surrounding the lake was used in 1980 by the Wildlife Service, Department of Internal Affairs brochure for the 'Evolution and Future of Wetlands.' The brochure outlined the detrimental effect European settlers and farming ambitions had taken on the destruction of wetlands throughout the nation over 140 years. At that time, the brochure estimated that "over 80% of New Zealand's natural lowland wetlands

[492] Leathwick, J., *et al.*, 2003, Land environments of New Zeland: Ngā Taiao o Aotearoa, p. 162.

had disappeared". It attributed the main factors to drainage, the removal of natural vegetation, increases in sedimentation (largely due to the vegetation losses on the edges), and increases in nutrients (due to fertilisers and cattle access). These factors were all affecting Lake Waiorongomai and comments such as the following quote ended up coming true for this site as well, and is discussed in the next section.

> Instead of allowing the development of a variety of seral stages such as flax and toitoi communities, manuka and other shrubs and eventually forest on the drier land, the pursuit for increased agricultural production has led him (man) to develop pasture almost to the very water's edge.[493]

When compared with the earlier photograph (Figure 3.2.12) the aerial photographs taken by Tim Park in 2007 show the reduction in native vegetation surrounding Lake Waiorongomai and the use of historic ephemeral wetlands for pastoral grazing (Figure 3.2.13 and 3.2.14). The first photograph shows Lake Waiorongomai and the remains of Lake Kahuwera. Kahuwera exists as a small swampy area and drain seen in the bottom right hand corner of Figure 3.2.13. Figure 3.2.14 shows evidence of pasture up to the margins of Lake Waiorongomai, with no fencing to prevent cattle access. A few remnant areas of native vegetation remain around the lake and Waiorongomai Stream.

[493] Te Rūnanga o Raukawa Inc., 2011, Attachment 7. (unpublished report)

Figure 3.2.13 Aerial photograph taken 2007 of Lake Waiorongomai and the remains of Lake Kahuwera (*Source: taken by Tim Park, north Otaki wetland photo roll, 2007)*

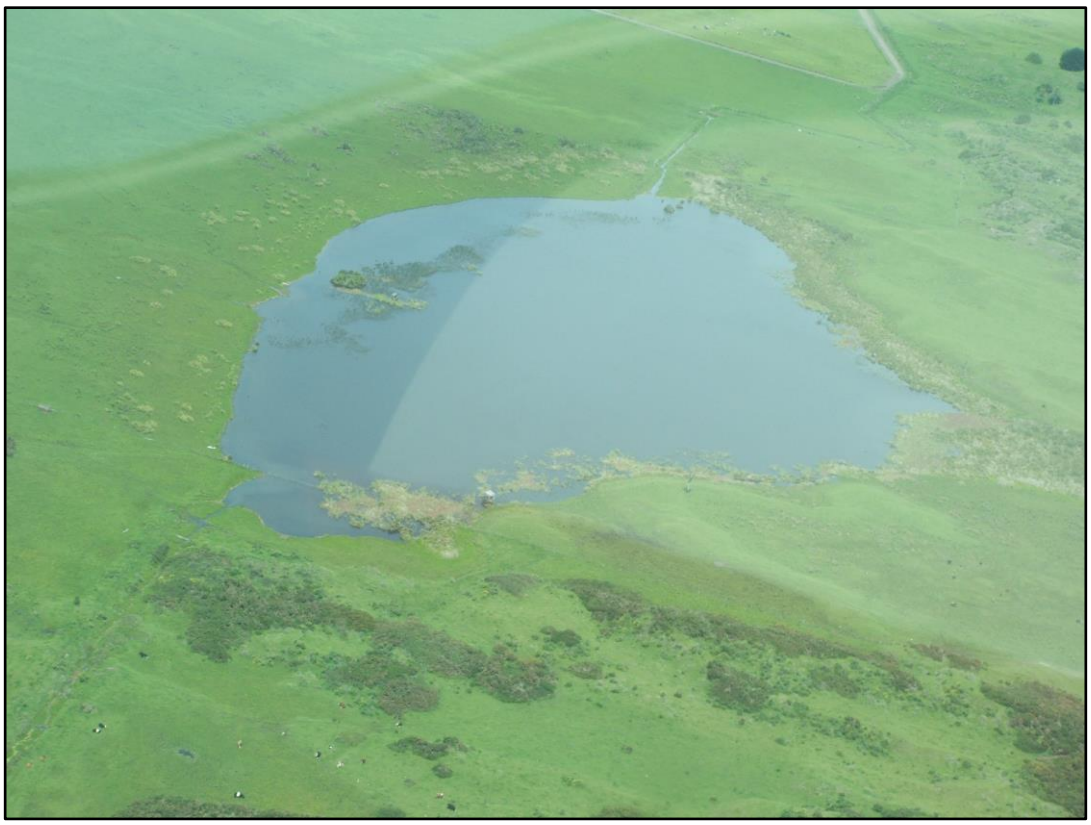

Figure 3.2.14 Aerial photograph taken 2007 of Lake Waiorongomai (*Source: taken by Tim Park, north Otaki wetland photo roll, 2007)*

Figure 3.2.15 shows a reduction in native plants surrounding Lake Waiorongomai to only two main areas - approximately 40% of the lake edge. Deforestation including in the 1800s that removed tall trees for the export timber industry, as well as more recently for grazing, resulted in a large amount of silt entering the lake and resting on the bottom, especially on the deeper western side. This has caused a very boggy and hazardous area that is not safe for swimming. The effects of farm run-off also increased because, without a riparian edge to soak up the defecation of cattle, this waste material ran directly into the lake. These inputs of faecal contamination disrupted nutrient and bacterial levels within the lake. This was considered by the whānau as being unsafe to swim in.

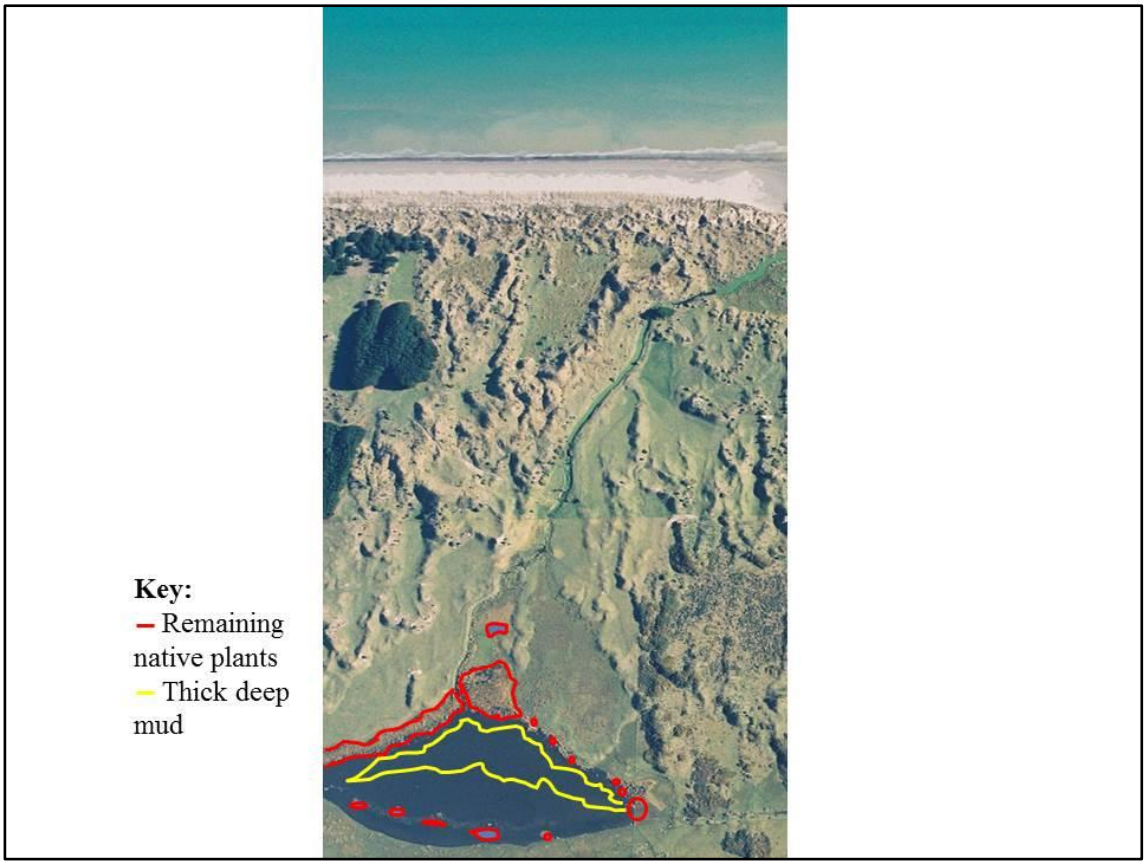

Figure 3.2.15 Aerial photograph of Lake Waiorongomai showing existing native vegetation areas *(Source: adapted from original source photograph: Lorraine Cairns, June 2009, Ahi Kaa Roa- Mapping Cultural Landscape project. Photo supplied by Te Iwi o Ngāti Tukorehe)*

3.2.7 Social interactions

Relationships between some whānau and hapū members and the leasee farmer of 3B1, 3B2 & 3B3 had become strained over time caused by fundamental differences in worldviews and values, as well as inter-personal relationships. Many farmers clear land in order to improve and increase pastoral lands. Leasee Hans Somers was known to be a hard-working farmer who, like other farmers routinely cleared weeds, on the blocks – he leased. He also burnt harakeke and other bush surrounding the lake, as well as created new drains, the results of which had been sighted by whānau and hapū members (Figure 3.2.10 and 3.2.11) who were unhappy with his actions. Due to these actions, the lack of fencing and cattle contaminating the sacred site, Hans had on past occasions been verbally abused.[494] To complicate matters Hans had voting powers on Waiorongomai Block 3B2. This was because he married into the whānau of Lake Waiorongomai as husband to Erna Winterburn-Somers. Erna is the major shareholder of the Waiorongomai Block 3B2 that is a large block surrounding Lake Waiorongomai. Due to health concerns and her opinion that Hans managed the cattle and property well, Erna signed over power of attorney for this block to him.[495] Kuia Nellie Carkeek was close to her cousin Erna and thus was able to bridge the gap and introduce me to Hans early on in the project.[496]

Waiorongomai Block 1A leasee Kathy Simcox had leased the block for a number of years due to it connecting to their neighbouring Waiorongomai land blocks. There was some strain in the relationship, with the owners wanting to increase rent. However the leasee was reluctant to accept this change due to the block being largely unproductive, sandy soil and thus in poor condition as grazing pasture. The unproductivity of this

[494] N. Carkeek, personal communication, 20 June 2012.
[495] E. Winterburn-Somers, personal communication, 16 September 2013.
[496] Nellie Carkeek, Hans Somers and Aroha Spinks, informal meeting at Café Ra in Ōtaki, 31 July 2013.

land was highlighted by the Maori Trustee (Mere Whanarere) in a report attached to her letter dated 30 April 2010.[497]

> Waiorongomai 1A is an uneconomic block of very light sand country…. It has relatively low overall stock carrying capacity – assessed at 120 stock units…. The Simcox's have been farming 1A for several years now. It is rather fragile country that needs to be carefully farmed and not overgrazed.[498]

The land blocks to the south of Lake Waiorongomai (Block 7A, 7B and 7C) as well as the block surrounding Lake Kahuwera just north of Lake Waiorongomai (Block 2A) are currently owned by David Keelan. Rupene Waaka had a good longstanding relationship with David Keelan. All other land blocks surrounding Lake Waiorongomai are Māori owned by multiple related hapū and whānau members.

An important factor in the success of this doctoral research and the restoration project involved the author having kaumātua and kaitiaki guidance when dealing with leasees and land owners. Before approaching farmers and land owners, it was important to research and understand (as far as possible) historic and current interrelationships, especially issues that continued to impact on local whānau hapū and iwi. Establishing good communication was essential to the success of this project, this was particularly important because those involved in the restoration and research project had to traverse over neighbouring lands to get to Waiorongomai Block 10.

[497] Material provided with permission for use by Kaumātua and Waiorongomai 1A Trustee, Nick Albert 19 November 2012, a copy of a Māori Trust Office Letter dated 30 April 2010 and a copy of the Report to Owners Waiorongomai 1A prepared by the Maori Trustee (Mere Whanarere).
[498] Ibid, a copy of the Report to Owners Waiorongomai 1A prepared by the Maori Trustee (Mere Whanarere).

Numerous owners in Waiorongomai Block 10 as well as the five surrounding Māori-owned neighbouring blocks (Waiorongomai 1A, 3A, 3B1, 3B2, 3B3) added to the social complexity of a restoration project led by whānau and hapū. The number of listed owners on the Te Kooti Whenua website[499] in April 2009 for Waiorongomai Block 10 were 536[500] and in 2014 there were 700 (Table 3.2.2). In addition a number of the listed owners are also represented by Whānau Trusts, for example 'Edward James William and Betty Ngamare (Chase) Te Paki Whānau Trust', 'Rawiri Te Wanui Wehipeihana Kaitiaki Trust, Tahiwi (Arapeta) Albert Whānau Trust', 'Te Pupuri Whenua Trust O Puke Te Ao Whānau Trust'. The number of owners for the surrounding five blocks and Waiorongomai Block 10 are listed in Table 3.2.2. Note, this is not all the owners as the list includes trusts that represent a further number of owners.

Table 3.2.2: Current owners of Waiorongomai Blocks 1A, 3A, 3B1, 3B2, 3B3 & 10, including family trusts.

Block	**Listed number of owners**
1A	98
3A	108
3B1	21
3B2	15
3B3	114
10	700
Total	**1056**

(*Source: Te Kooti Whenua Māori – Māori Land Court website, www.maorilandonline.govt.nz, date 20 February 2014*)

In addition the rural location of the Waiorongomai Block 10 creates both benefits and problems for visitation by non-owners. The location of Lake Waiorongomai is largely unknown except by iwi members. No-one lives near-by in sight of the lake and many Ōtaki residents do not know where it is. Whānau report that the area has been targeted by thieves who have taken advantage of certain opportunities. For example, the

[499] Māori land online (www.maorilandonline.govt.nz).
[500] Te Rūnanga o Raukawa Inc., 2011, Attachment 3. (unpublished report)

reference to an earlier grant received for the Lake Waiorongomai restoration purchased equipment to erect a temporary electric wire fence was not completed due to the whānau concerns about the likelihood of thieves taking it.[501] Two burglary incidents occurred during the Lake Waiorongomai restoration project described later in Chapters 5 and 6.

A common comment among the Waiorongomai whānau at the beginning of the restoration project was that the Lake Waiorongomai 10 Trustees were all but one (Horima Carkeek) living out of the local area (Figure 3.2.16). Some whānau felt that the trustees were no longer as accessible and committed. Regular meetings were not being held by the Trust to keep the whānau informed of progress towards the Lake Waiorongomai restoration aspirations.

Figure 3.2.16 Lake Waiorongomai 10 Trustees in 2002 *(Source: Waaka, R., 6 March 2014, Presentation Slide 23)*

[501] Material provided with permission for use by Kaumātua and Waiorongomai 1A Trustee, Nick Albert 19 November 2012, a copy of the Lake Waiorongomai Restoration Meeting Minutes 19 April 2009, p. 5.

Chapter 4 Research methodology for the Lake Waiorongomai restoration project

Nōu tō piki amokura

Nōku tōku piki amokura.

You have your worldview and I have mine. Both are valid.

The aim of this chapter is first, to locate the researcher in the research context and second, to explain the roles of two different knowledge traditions (i.e. kaupapa Māori and western science) in contributing to this thesis and hapū[502]-led lake restoration project. The research approach that employs two different knowledge traditions and draws on two western academic fields of study (i.e. action research and applied ecology). This research aims to contribute to both mātauranga[503] Māori and western scientific knowledge through the principle use of what is here described as a kaupapa Māori research methodology. The decision to employ kaupapa Māori research as a primary methodology for this doctoral research and hapū-led restoration project is dictated by the cultural context in which this research endeavour is positioned (i.e. a Māori community). Māori and Pākehā methods for restoration activities and the doctoral research endeavour were woven together, as described in detail in Chapter 6 (sub-sections 6.2 and 6.3).

[502] Sub-tribe, clan.
[503] Knowledge, information, education.

The English words 'method' and 'methodology' imply the existence of two very different questions that seek to better understand how knowledge is developed in a western scientific context. A method is by definition a technique or procedure that is followed in order to achieve a certain outcome. The use of method in western science is an area of study in its own right. Partly because it is generally recognised that: (i) method and experimental results are inextricably interconnected; and that (ii) it should be possible to replicate the same method in a similar research context in a way that generates predictable results. By contrast, methodology is not the study of procedure, technique or method, but an attempt to explain just why a given method or system of methods was used in a given research context. Methodology provides a theoretical analysis and positioning of the methods and guiding principles associated with a particular branch of western scientific knowledge development.

While well-established conventions emphasise the importance of 'methodology' to scientific writing, the same requirement is more difficult to establish in a kaupapa Māori research modality. Given that this thesis partly focuses attention on a comparative application of Māori cultural and western scientific knowledge development methods (i.e. epistemologies), initial comment on the relevance of 'methodology' in a Māori knowledge development context may be helpful to some readers.

Following the publication of the first edition of the book '*Decolonizing methodologies: research and indigenous peoples'* by Linda Tuhiwai Smith in 1999,[504] Māori scholars have invested much effort in the development and written articulation of a modern-day, Māori cultural approach to knowledge development that has been characterised as 'kaupapa Māori research'. According to Linda Smith, kaupapa Māori research is a response to three priorities of importance to Māori scholars and communities.

[504] Smith, L., 1999.

> First, some space to convince Maori people of the value of research for Maori; second, to convince the various, fragmented by powerful research communities of the need for greater Maori involvement in research; and third, to develop approaches and ways of carrying out research that take into account, without being limited by, the legacies of previous research, and the parameters of both previous and current approaches. What is now referred to as kaupapa Maori approaches to research, or simply as kaupapa Maori research, is an attempt to retrieve that space and to achieve those general aims.[505]

It is interesting to note that (in 1999) according to Linda Smith, the reclaiming and reframing of ancestral approaches to Māori knowledge development was not an attempt to articulate an alternative methodology or philosophy of knowledge development. Rather, it is an expression of a Māori methodology that is centred upon our understandings, and grounded in mātauranga Māori. A similar idea is articulated by her husband, Graham Hingangaroa Smith, who suggested that kaupapa Māori research is:

> (i) related to being Maori;
>
> (ii) connected to Maori philosophy and principles;
>
> (iii) takes for granted the validity and legitimacy of Maori;
>
> (iv) the revival and survival of Maori language and culture; and

[505] Smith, L., 1999, p. 297.

> (v) concerned with 'the struggle for autonomy over our own cultural well-being'.[506]

By comparison, Tuakana Nepe in her Master's thesis (cited by Linda Smith) argues that:

> kaupapa Māori is derived from very different epistemological and metaphysical foundations and it is these that give kaupapa Maori its distinctiveness from Western philosophies. [507]

Linda Smith elaborated this quote by going on to state that:

> In other words, there is more to kaupapa Maori than our history under colonialism or our desires for self-determination. We have a different epistemological tradition, one which frames the way we see the world, the way we organize ourselves in it, the questions we ask and the solutions that we seek. It is larger than the individuals in it and the specific 'moment' in which we are currently living.[508]

Linda Smith positions kaupapa Māori research as a decolonising adaption or contextual (cultural) adjustment by Māori scholars and communities in response to the existence of a (modern-day) dominant research orthodoxy. Graham Smith seeks to move beyond the problem of contextual adjustment to the distinctly Māori cultural character of an emerging 'kaupapa-based' approach to knowledge development (i.e. based on Māori philosophy, principles, language and culture). Tuakana Nepe suggests the existence of

[506] Smith, G., 1992, Research issues related to Māori education, pp. 2-3.
[507] Nepe, T., 1991, Te toi huarewa tipuna: Kaupapa Maori, an educational intervention system. Cited in Smith, L., 1999, p.304. Note: the original text is a Masters Thesis with closed access submitted to the University of Auckland.
[508] Smith, L., 1999, p. 304.

a distinctive Māori epistemology. The characteristics of kaupapa Māori research articulated by Linda Smith, Graham Smith and Tuakana Nepe move us closer towards a Māori 'methodology' of knowledge development. Anthony Cole suggests that the written articulation of a kaupapa Māori methodology might well be for the benefit of dialogue with western science rather than the ongoing knowledge creation activities of Māori scholars and communities.[509]

In the remainder of this chapter I have taken the view that while questions concerning the direct relevance of the western scientific notion of 'methodology' to kaupapa Māori research are being further explored by Māori scholars and communities, it is helpful (in the meantime) to document my own thinking on methodology as it relates to this doctoral thesis and hapū-led creative activity.

The purpose of this research was not only to produce an academic output that is this doctoral thesis, but to extend the current status of academic literature, particularly that which is actively concerned with bringing about transformative change that benefits Lake Waiorongomai and associated whānau[510] and hapū. With this purpose in mind, this methodology chapter documents the rationale behind this research endeavour and thus introduces and elaborates on the research methods and results in chapters 5 to 7. In the remainder of this chapter, this writing goal is accomplished by: (i) describing the research rationale; and (ii) theoretically characterising and positioning the action research and kaupapa Māori knowledge-development frameworks that are compared and contrasted as part of this doctoral thesis.

[509] A. Cole, personal communication, 5 December 2017.
[510] Family, extended family.

4.1 Research rationale

As Charles Te Ahukaramū Royal[511] stated, "methodology influences everything in the research process"[512] from the focus of the research, to the way in which knowledge is gathered, answers derived, to the outcomes determined. Methodology is generally explained by reference to the existence of an underpinning rationale or logic that is sometimes defined by the use of axioms. The rationale for the use of a cross-cultural approach to knowledge development in this doctoral thesis and hapū-led research endeavour is explained below.

First, the use of both Māori and western scientific knowledge traditions follows from an acknowledgement, on the part of local hapū and kaitiaki that western science plays an essential role in helping Māori to remedy ecological decline that is a direct consequence of colonisation. In particular, the methods, social engagement processes and learnings of action researchers and ecologists greatly assisted the achievement of hapū-led lake ecosystem restoration objectives. However, what this thesis seeks to show is that reflection on the use of action research process has highlighted the need for recognising that this paradigm could be enhanced by engaging with (i) further cross-cultural applications of this methodology and (ii) the published work of kaupapa Māori theorists.

Second, the rationale associated with the primary use of kaupapa Māori research in this hapū-led lake ecosystem restoration project follows from the clearly articulated wishes of local hapū and kaitiaki, the existence of a Māori worldview (Chapter 2) and Māori ancestral landscape that is in decline as a result of colonisation (Chapter 3). In research,

[511] Iwi member: Ngāti Raukawa, Ngāti Tamaterā, Ngā Puhi. A Māori musician and academic, who writes on the subject of Kaupapa Māori and is currently Director Ngā Manu Atarau at Museum of New Zealand Te Papa Tongarewa.
[512] Royal, C., 19 November 2006, Kaupapa Māori and Mātauranga Māori Presentation at Waikiki, Honolulu, p. 1.

it is necessary to adapt the use of knowledge development method to a given problem context. Given that the problem context in this case concerns the wellbeing of Te whānau ā Ranginui rāua ko Papatūānuku[513], western science cannot be exclusively used in a cultural context, where the problem being studied involves the survival of Māori culture which is inextricably interrelated with ecosystem survival.

Based on customary understandings of whakapapa and kaitiakitanga, protecting the mauri of ecosystems has become a key priority for hapū engaged in restoration projects.[514] In a previous coastal biodiversity study, kaitiaki encouraged the incorporation of Te Ao Māori[515] and indigenous planning processes into environmental management would accelerate the restoration of culture and nature by the enhancement of mauri within mahinga kai[516].[517,518] Exclusive use of western scientific method in a problem context of this kind would contribute towards enhancing western science (and culture) focused outcomes, but not necessarily mātauranga Māori focused outcomes. In this current research endeavour, kaupapa Māori research is being used as a means of achieving transformative change. The success of this project, as measured by many different types of indicators suggests that there is much that can be learnt from the use of kaupapa Māori research as an agent of transformative change at both the Māori community and ecosystems levels of scale. As such, this thesis and hapū-led restoration project contributes in a unique way to action research and applied ecology literature.

Finally, the dominant use of a kaupapa Māori research approach means that contributions to knowledge development are not exclusively linked to the use of a

[513] The extended family of the sky father (Ranginui) and earth mother (Papatūānuku).
[514] Forster, M., 2012, Hei whenua papatipu: kaitiakitanga and the politics of enhancing the mauri of wetlands, p. iv.
[515] Māori worldview.
[516] Cultivation, food gather place.
[517] Dick, *et al.*, 2012, p. 129.
[518] Twenty two kaitiaki interviewees from fourteen iwi and hapū around the north island. Dick, *et al.*, 2012, p. 119.

hypothesis testing method. Instead, reflective practice is used as a defining characteristic of (the closely aligned) action research method. Nor is the scope of this research endeavour limited to a single disciplinary orientation. Mātauranga Māori is not organised according to a disciplinary framework. Instead, the creation of Māori knowledge is positioned in a worldview context that is holistic. Thus, in western academia terms, this research project involves disciplinary contributions from physical and social sciences and the humanities. The cross-disciplinary development of knowledge in this way is not thought unusual in a Māori cultural context. It is simply an expression of whakapapa. By contrast, western science is still coming to terms with transdisciplinary approaches to knowledge development.[519]

The rationale for this doctoral thesis and hapū-led lake restoration project is also partly related to questions concerning: (i) the role of transformative change (sub-section 4.1.1); (ii) the social location of the researcher (sub-section 4.1.2); the role of social mediation in kaupapa Māori research (sub-section 4.1.3); and (iv) the need for restorative and revitalising remedies (sub-section 4.1.4). These additional aspects of methodological rationale are elaborated below.

4.1.1 Rationale for the role of transformative change

Choice of research methodology for this project was influenced by the need for transformative change at many levels. The selection of preferred methods was mediated by hapū and whānau members, as the restoration project developed. The term 'socially mediated' indicates that whānau and hapū members were overarching decision-makers. They were supportive of certain external advice, actions, measures and involvement of, individuals and groups', however they clearly determined who would benefit the lake system. More often than not, restoration activities, decisions, discussions, research and

[519] McGregor, S., 2015, The Nicolescuian and Zurich approaches to transdisciplinarity.

knowledge development were made collectively, rather than by individuals. In addition, opportunities existed for the restoration project and doctoral research endeavour to include social events, such as hui[520], hīkoi[521] and wānanga[522] that supported the hapū mediation process.

There was a strong preference by whānau and hapū for an overarching Māori methodological approach rather than a western science or cross-cultural[523] methodological approach. Additionally, whānau and hapū preferenced the use of a range of Māori and Pākehā methods and restorative actions. Furthermore, whānau and hapū felt more comfortable with a kaupapa Māori approach that expressed tino rangatiratanga[524] and therefore they actively engaged with the project.

While whānau and hapū of Lake Waiorongomai have a strong sense of cultural identity, recent Treaty of Waitangi research revealed that colonisation has contributed to a great loss of mātauranga Māori by severing or eroding iwi[525] members' connections with their rohe. In an oral history interview, Mereana Selby-Rickett[526], Tumuaki[527] of Te Wānanga o Raukawa commented:

> It is very obvious to me that there is a direct correlation between decline and environmental quality, ability for our people to

[520] Meeting, gather.
[521] Walk.
[522] Learning, workshop, seminar.
[523] "Cross-cultural research is considered to be research that draws from and makes comparisons across different cultures." Quote from Hardy, D., *et al.*, 2015, Cross-cultural environmental research processes, principles, and methods: coastal examples from Aotearoa/New Zealand p. 46. Note: This was also not an appropriate methodology in this doctoral thesis due to the research being conducted within our own culture.
[524] Absolute sovereignty.
[525] Tribe, nation.
[526] Iwi member: Ngāti Raukawa ki te Tonga, Ngāti Pareraukawa.
[527] Principal.

> sustain for themselves and their families and the dismantling of the language and culture.[528]

The severing of whānau and hapū members ties with Lake Waiorongomai and surrounding blocks (that they owned) was evident at the start of this project in 2012. As a result, considerable effort was invested in restoring whānau relationships with the lake. Thus, a key aspiration associated with Lake Waiorongomai restoration was to ensure cultural survival, knowledge development and see whānau members return to this sacred site. This meant that an additional challenge of reclaiming, reframing and re-instating cultural practices at the lake existed for all whānau and hapū participants. Restoring local Māori knowledge development among hapū and whānau was essential to ensuring that future generations (who will come from a variety of backgrounds) maintain ties with the lake. A collective desire for transformative changes of this kind was the most significant influence that shaped the choice and use of project methods.

Active restoration efforts and research were conducted in accordance with local kaupapa and tikanga (i.e. values and correct ways of doing things). This thesis is based on local whānau and hapū perceptions and is guided in particular by kaumātua[529] of Lake Waiorongomai. In accordance with Māori custom, hapū members mediated the framing of this doctoral research methodology. Most significantly, many whānau and hapū members were familiar with the term 'kaupapa Māori research' and readily accepted a kaupapa Māori research methodological approach.[530] There was also a good level of comfort with the additional use of western scientific research methods. This

[528] Poutama, M., *et al.*, 2017, Porirua ki Manawatū Inquiry: Inland waterways cultural perspectives collation of oral narrative report, p. 87.
[529] Elders.
[530] LWRP Wānanga, 22-23 February 2014.

included their comfort with the use of the word 'research'.[531] Within this doctoral thesis the term 'research' is defined here as 'the search for knowledge development comprised from a range of creative activities conducted for the purpose of increasing knowledge, as well as their application.'

A further complication associated with achieving transformative change within the restoration area was the state of strained relationships between land owners and leasees caused by differences in worldviews, values, relationships and understandings of legal entitlement. A further complication associated with achieving lake restoration outcomes was the physical differences in the landscape. For example, land blocks surrounding Lake Waiorongomai did not match the fence lines. Meeting the varied needs of affected owners and leasees required inclusive processes and values.[532]

A cross-cultural methodology was not appropriate in the Lake Waiorongomai restoration project because as I was the only researcher involved working within a hapū-led case study. We as whānau and hapū were immersed within our own cultural context. By contrast, the cross-cultural methodology used within the Manaaki Taha Moana (MTM) programme was appropriate because it utilised expertise from numerous backgrounds, organisations and areas of disciplinary specialisation to address the multiple local case studies in both the Horowhenua and Tauranga regions.[533]

4.1.2 Social location of research

The following components of my identity help establish the lens in which I viewed and approached this doctoral research endeavour. I am a female researcher and solo mum, with two children (Āwhina and Kiinui). I whakapapa to Ngāti Raukawa ki te

[531] It is acknowledged that in certain circumstances other kaupapa Māori research approaches preference the term 'creative activity' over 'research'.
[532] Further detail in Chapters 5 and 6.
[533] Hardy, D., *et al.,* 2015.

Tonga and Ngā Hapū o Ōtaki (as a member of Ngāti Kapū). Local whānau and hapū trusted me, as a whānaunga[534], to keep their best interests in mind. Although I had lived in Ōtaki for eight years and knew some members of this community well, many of the local whānau and hapū saw me as a relative newcomer. This meant I had to gain their trust from the beginning of the research project. To this end, I was involved as an active participant in the research and played a role in all the hands-on restorative actions.

As a descendant of Ngāti Kapu and Ngāti Raukawa ki te Tonga my whakapapa not only connected me to the people but also grounded me to the place. My tūpuna had also bathed in Lake Waiorongomai to whakanoa[535] after battles so there was always an awareness that their blood had mixed with those waters. That same blood and DNA exists within me. I often pondered how this would have soaked into the environment and become part of this sacred site. My kaitiakitanga responsibilities inherited at birth extend not only from my relationship to tūpuna[536], but also encourages me to help sustain te taiao[537] of our rohe for our future generations.

My whakapapa includes both Māori and Pākehā ancestors, whom I am proud of. I am comfortable with both worldviews and knowledge systems. English is my first language. My mum[538] was a solo mum and at first we lived with my nan[539] and koro[540] for five years, which grounded me in tikanga from an early age. My dad[541] was a farmer from a large farming family. I had 10 years experience of living on a farm, that ran a 300+ dairy heard. I had many relatives to draw on for advice. This background

[534] Relation.
[535] Free from sacredness, to make ordinary.
[536] Ancestors.
[537] Environment and natural world.
[538] Eila Paul.
[539] Grandmother - Kerehi Karetai (nee Irirangi) or Grace Paul.
[540] Grandfather - Tanira Paora or Dan Paul.
[541] Peter Spinks.

was useful when engaging with the whānau as well as leasees during the Lake Waiorongomai restoration project.

I studied at University[542] in fisheries science graduating with distinction and first class honours. My interests in fisheries, fisheries economics, earth sciences, marine sciences, ecology, environmental sustainability and resource management played a pivotal role in developing my research lens. While I brought a Māori 'scientist' perspective to the restoration project and research, I have an ability to observe the natural world from both mātauranga Māori and western scientific perspectives, which I consider are complementary.

My employment history provided business and project management skills from a career in the seafood industry including Moana Pacific, Sealords and experience in Japan with Nippon Suisan Kaisha. When I started this project, I was new to environmental restoration work, and had a lot to learn. Initially, I was employed by our iwi environmental research unit, Te Reo o Taiao Raukawa ki te Tonga (Taiao Raukawa), which provided me with opportunities to gain important iwi and hapū support and ecological restoration mentoring.

4.1.3 Rationale associated with the hapū-mediated choice of the research approach

As described earlier, five hapū members had been elected by the hapū to represent them on the Kaitiaki team for direct regular communication with me. This team made the initial decision that a kaupapa Māori approach would be the most appropriate and acceptable methodology for this restoration project and doctoral research endeavour. They requested that I collate a set of known Ngāti Raukawa ki te Tonga iwi authors who had published relevant material in the area of improving environmental ecosystem

[542] Australian Maritime College, now a specialised institute in the University of Tasmania, located at Beauty Point, Tasmania, Australia.

wellbeing. I was asked to present options to the hapū for discussion at the first Lake Waiorongomai restoration wānanga.[543]

One workshop was dedicated to that task. As part of the preparation for the wānanga I had provided the kaitiaki team members with the selection of options and the draft handout, which they accepted (Table 4.1.1). After I delivered an accompanying powerpoint presentation and distributed handouts, three breakout groups were formed to workshop their ideas about a preferred research framework.

Table 4.1.1 Raukawa ki te Tonga kaupapa Māori research approaches relevant to an environmental restoration project.

Authors*	**Name and date of publication**	**Kaupapa**
Mason Durie	Whaiora: Maori health development, 1994 (based on his Whare tapa whā – health model 1982)[544,]	1. Taha wairua (spiritual health), unseen and unspoken energies: faith and spiritual awareness 2. Taha hinengaro (mental health), inseperability of mind and body: expressing thoughts and feeling 3. Taha tinana (physical health), good physical health 4. Taha whānau (extended family health), wider social systems: belonging sharing and caring
Whatarangi Winiata	How kaupapa contribute to innovative activities, 2009[545]	1. Manaakitanga (Behaving in ways that elevate others; showing respect and consideration toward others; generosity and fulfilling reciprocal obligations) 2. Rangatiratanga (Exhibiting leadership by example; the ability to bind people together; following through on commitments) 3. Whanaungatanga (Recognising that our people are our wealth; knowing that you are not alone; and, assuring others that nor are they alone) 4. Kotahitanga (Making decisions and taking action that leads to unity of purpose and not to division and disharmony) 5. Wairuatanga (Recognising that our relationship with each other and with our environment (maunga (mountains), awa (streams), moana (oceans), marae (meeting places)) is more than physical) 6. Ūkaipōtanga (Having a sense of importance, of belonging and of being a contributor to your land, to your home, to your tūrangawaewae (place to stand)) 7. Pūkengatanga (Teaching, preserving and creating knowledge as part of the mātauranga (knowledge/philosophy) continuum and with other ways of knowing) 8. Kaitiakitanga (Acting so as to preserve and

[543] 22-23 February 2014.
[544] Durie, M., 1994, Whaiora: Māori Health Department, pp. 68-74.
[545] Winiata, W., 2009, How kaupapa contribute to innovative activities.

		maintain taonga (treasures); ensuring safety in all activities) 9. Whakapapa (Ranginui and Papatūānuku (Sky Father and Earth Mother) and their children are here; our tūpuna (ancestors) are beside us; we are one with these as we carry out our role in the creation of our future) 10. Te Reo (Māori) (This [the Māori language] is the repository of all that we are as Māori)
Mahina-a-rangi Baker	Sustainable futures, 2009[546]	1. Rangatiratanga (deeply respects the knowledge and authority of Māori scholars) 2. Whakapapa (utilises Māori epistemology) 3. Pūkengatanga (contributes to the revitalisation of Māori scholarship) 4. Kotahitanga (creates a safe space)
Richard Jefferies*, Nathan Kennedy	Kaupapa Māori Environmental Outcomes and Indicators Kete, 2009[547]	1. Mana (Mana Whenua) 2. Mauri (Mauri of Waterways) 3. Tapu (Wāhi Tapu) (NB: A second set still in development – Mauri of Forests, Kaitiakitanga, Treaty of Waitangi)
Pātaka Moore*, Caleb Royal*, Alex Barnes	Te Haerenga Whakamua, 2012[548]	1. Pūkengatanga (Processing knowledge creation, dissemination and maintenance that leads to scholarship and contributes to the mātauranga (knowledge) continuum of Māori.) 2. Ūkaipōtanga (The importance of tūrangawaewae, a place where one belongs, feels valued and is able to contribute.) 3. Manaakitanga (Behaviour featuring generosity, care, respect and reciprocity toward others.) 4. Kaitiakitanga (Caring for creation including natural resources, inherited treasures, other forms of wealth and community, including Māori as a people.) (NB: A reference to all ten Kaupapa Tuku Iho, however these four were common themes amongst the three Iwi (Te Āti Awa ki Whakarongotai, Ngāti Raukawa, and Ngāti Toa Rangatira Confederation of Iwi))
Huhana Smith*, Penny Allan	Bi-cultural studio in New Zealand, a case study, 2013[549]	1. Waharoa (Welcome onto the marae) 2. Hīkoi (Walking and talking on the whenua) 3. Whakapapa (Geneological system that makes sense of a complex world)

* NB: If more than one author then an asterisk denotes the Ngāti Raukawa ki te Tonga iwi member/s.

While all suggested research frameworks supported a kaupapa Māori research approach, responses varied from the three groups. One group preferenced Mason Durie's Whare Tapawha model as a suitable framework. They also commented that "we want Aroha's

[546] Baker, M., 2009, Working paper: A methodological approach to Māori-focussed research.
[547] Jefferies, R., & Kennedy, N., 2009 Kaupapa Māori environmental outcomes and indicators kete, p. 17.
[548] Moore, P., *et al.*, 2012, Te Haerenga Whakamua: A review of the district plan provisions for Māori, pp. 11-123.
[549] Allan & Smith, 2013, p. 144.

PhD to be an experience which is rooted in free and creative scholarly, intellectual space, where Aroha is empowered to shape and produce her own piece of original research." They continued defining their and my role in the doctoral research endeavour, stressing the importance of consultation with the whānau (Figure 4.1.1).

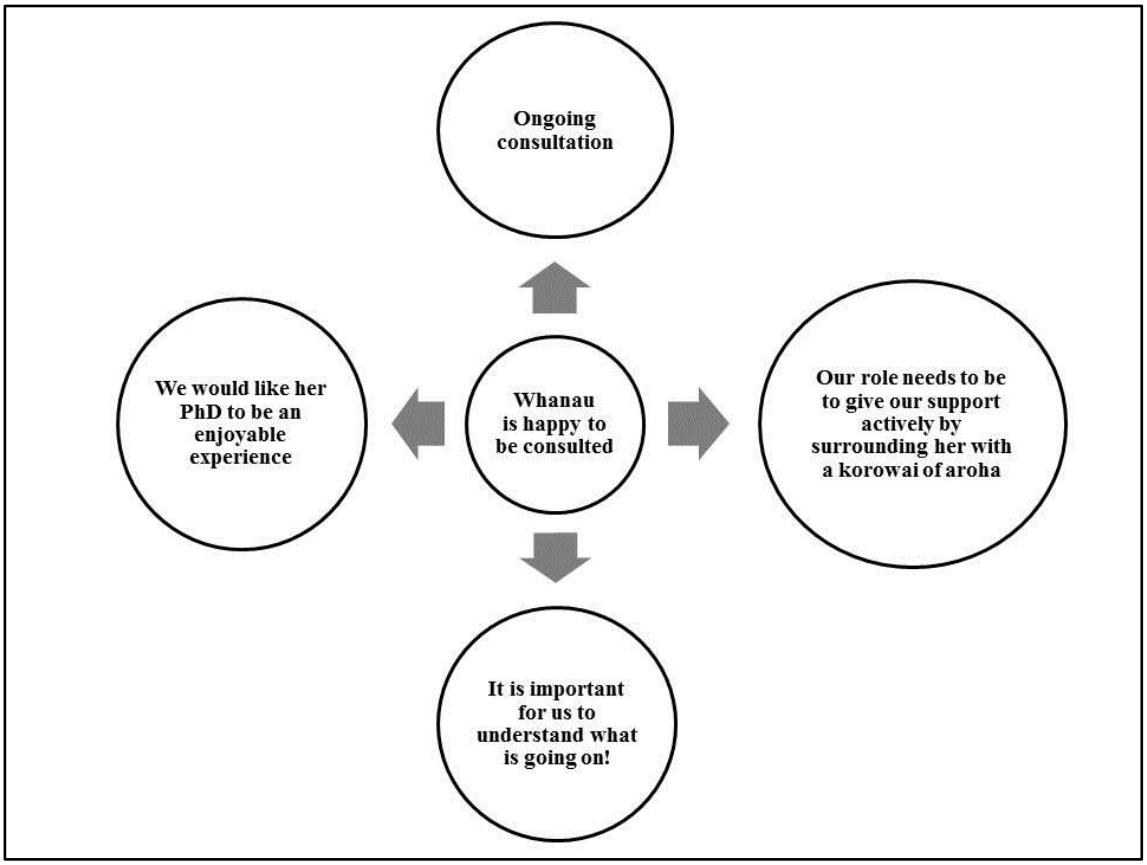

Figure 4.1.1 One wānanga workshop group response in regards to input into doctoral research approach.

The other two workshop groups preferred the kaupapa that contribute to innovative activities as outlined by Whatarangi Winiata. They listed various kaupapa, some with restoration and research examples alongside (Table 4.1.2). One group focussed on the doctoral research endeavour, while the other focussed on the Lake Waiorongomai restoration project.

Table 4.1.2 Two wānanga workshop responses on relevant kaupapa

Title	Kaupapa	Examples
PhD Outline	Mana whenua	
	Mauri	- Restoring the mauri, - Return the mana, - Restoring stocks
	Wairuatanga/Taha wairua	- Connection with the whenua, - Healing, - Taking our own energy there
	Whakapapa	- Return it back to one block - "All of Waiorongomai"
	Ūkaipōtanga	- Sense of belonging
	Whanaungatanga	- Sharing the enjoyment, - Interest
	Kotahitanga	- Maintain unity, - Progressing together
	Kaitiakitanga	
	Pūkengatanga	- Sharing knowledge handed down
Lake Restoration Kaupapa	Whanau space	- Plants - Sustain - Learning - Camp utilisation
	Dunes Western	
	Maintain	
	Walkway	- Access - Seats
	Ecological	- Upgrade water
	Wind break	
	Consent by other land owners	- For access
	Finance	
	Wharepaku	
	Whakawhanaungatanga	
	Communication	

The kaupapa were then reviewed and reflected upon by the whānau at the second wānanga held in 2015.[550] Whānau who were present at the second wānanga again supported the kaupapa Māori research approach was most appropriate. They decided on the kaupapa that were of the highest significance to the Lake Waiorongomai restoration project and to their cultural aspirations at that time. They discussed the potential of

[550] 13 June 2015.

using Mason Durie's 'Whare Tapa Wha' model as a possibility in the future (as an extension of the restoration project and possibly a new research endeavour) to reflect on its four main components and to assess if whānau wellbeing had been improved.

4.1.4 Rationale for the restoration of Te whānau ā Ranginui rāua ko Papatūānuku

As detailed in Chapter 2, Te Ao Māori[551] connects all natural things within our universe through intricate, interconnected, whakapapa and complex relationships in a holistic spiritual and physical manner. Māori tradition 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.[552]

Oral history provides numerous narratives of the whānau experiences of our tūpuna which indicate that: (i) they understood the existence of a delicate balance in the natural world[553]; (ii) developed kaupapa and tikanga that maintained this balance[554]; and (iii) were able to use the rhythms and cycles of the natural world to guide their annual calendar of events[555]. An interesting outcome of the expression of the kaupapa and tikanga developed and adapted by our tūpuna is that they managed to maintain the survival and wellbeing of themselves and the natural world (i.e. Te whānau ā Ranginui

[551] Māori worldview.
[552] Harmsworth, G., & Awatere, S., 2013, Indigenous Māori knowledge and perspectives of ecosystems, p. 274.
[553] Tikanga associated with selective harvesting of different age cohorts so as to maintain the integrity of breeding populations (e.g. eels).
[554] The institution of rāhui, the use of mauri stones and the return of wharenui to the earth.
[555] The development of a maramataka that guided everything from fishing and bird snaring to gardening. Enthnographer Elsdon Best shared knowledge of the maramataka offered to him by Reverend Metara Te Aomarere of Ōtaki. Best, 1929, p. 112.

rāua ko Papatūānuku) on these islands for a period of time estimated to be somewhere between 800–1000 years. This was a remarkable achievement. The expression of kaitiakitanga was an integral part of cycles of reciprocal generosity between various whānau members of Te whānau ā Ranginui rāua ko Papatūānuku. For example, the expression of generosity (e.g. provisioning of kaimoana) on the part of Tangaroa[556] was reciprocated by the expression of kaupapa and tikanga on the part of hapū that maintained the wellbeing and integrity of the domain of Tangaroa (Figure 4.1.2).

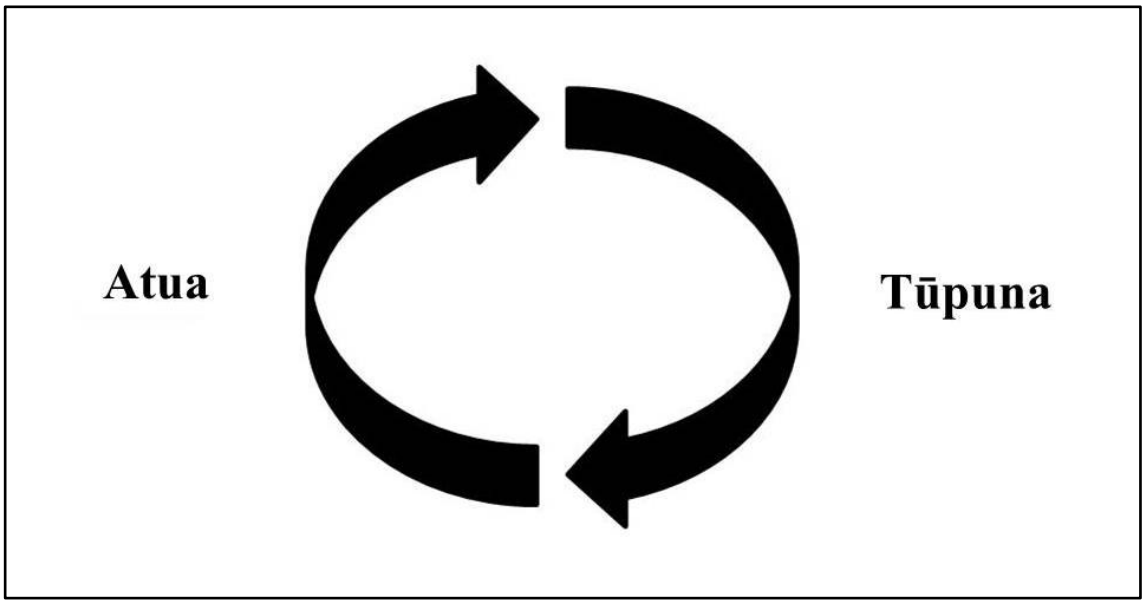

Figure 4.1.2 Cycle of generosity and reciprocity pre-1840.

Colonisation interrupted the cycles of reciprocal generosity, as depicted in Figure 4.1.3 between the various members of Te whānau ā Ranginui rāua ko Papatūānuku. This led to a decline in the wellbeing of natural ecosystems (i.e. atua[557] domains). The rationale for the use of ecological restoration as guided by kaupapa Māori research in this case study sought to reframe and reinstate the right hand side of the reciprocity cycle depicted in Figure 4.1.3. Chapters 2 and 3 of this thesis describe one half of an

[556] God of the ocean and fresh waters.
[557] Gods, deities.

incomplete reciprocal cycle as illustrated (Figure 4.1.3). Chapters 5, 6 and 7 will elaborate on the attempts made within this case study to reciprocate the generosity bestowed upon us by atua. This rationale also provides a further depth of meaning to the important of using a transformative research approach. Ecosystem restoration is not just about the application of a remedy to a damaged and degraded ecosystem. It is equally about the reinstatement of whānau and hapū to their rightful place as kaitiaki of the domains and cycles of reciprocal generosity in Te Taiao (Figure 4.1.3). More than reinstatement, this project is about the expression of kaupapa tuku iho[558] that provide a time-proven basis for ensuring the survival and wellbeing of Te whānau ā Ranginui rāua ko Papatūānuku.

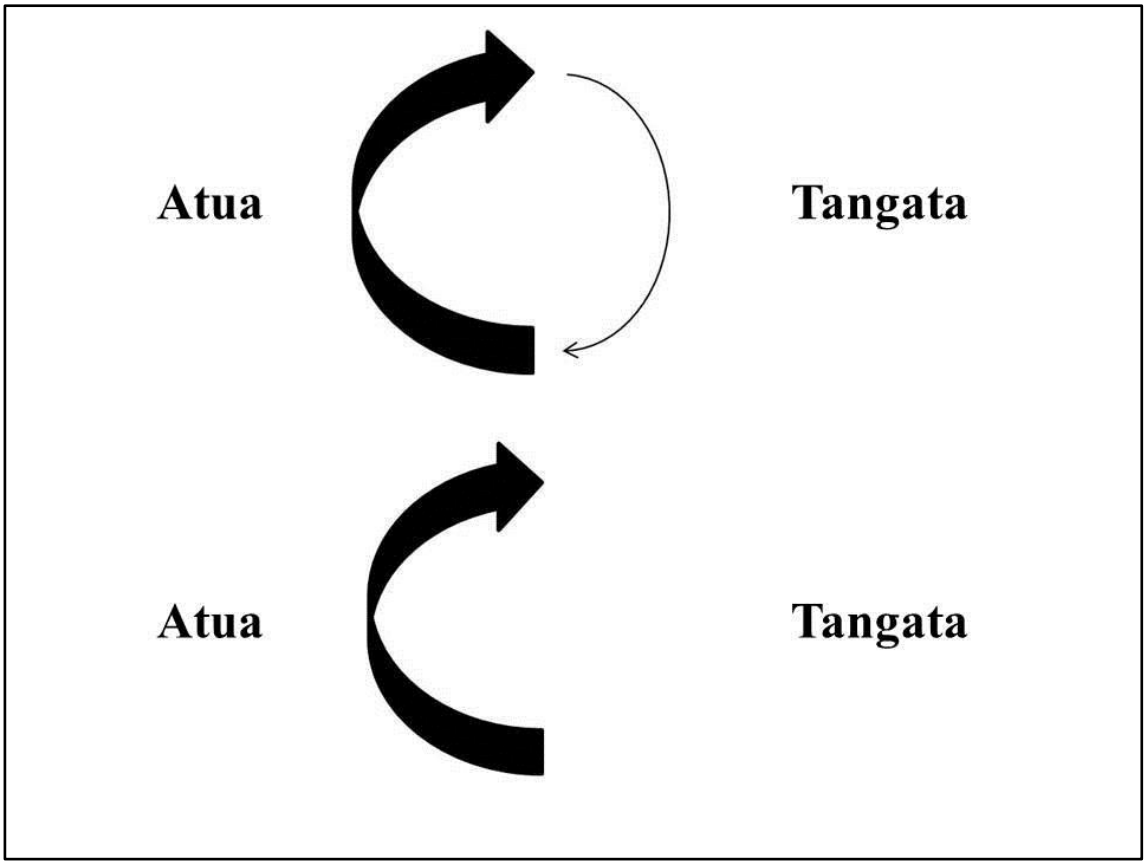

Figure 4.1.3 Cycle of generosity and reciprocity in Aotearoa[559] since 1840.

[558] Values passed down by our ancestors.
[559] New Zealand.

Figure 4.1.4 attempts to visually depict what the practical implementation of attempts made in this restoration project to restore the integrity of reciprocity cycles looks like. As the author I was surprised to discover in the generalised model shown in Figure 4.1.4, a pattern in the expression of kaupapa and tikanga in this project that is similar in character to key stages in an action research cycle. This reflective discovery led to an interesting question about how action research method could be applied in an indigenous cultural research context. I attempt to explore this insight in greater detail in Chapters 6 and 8.

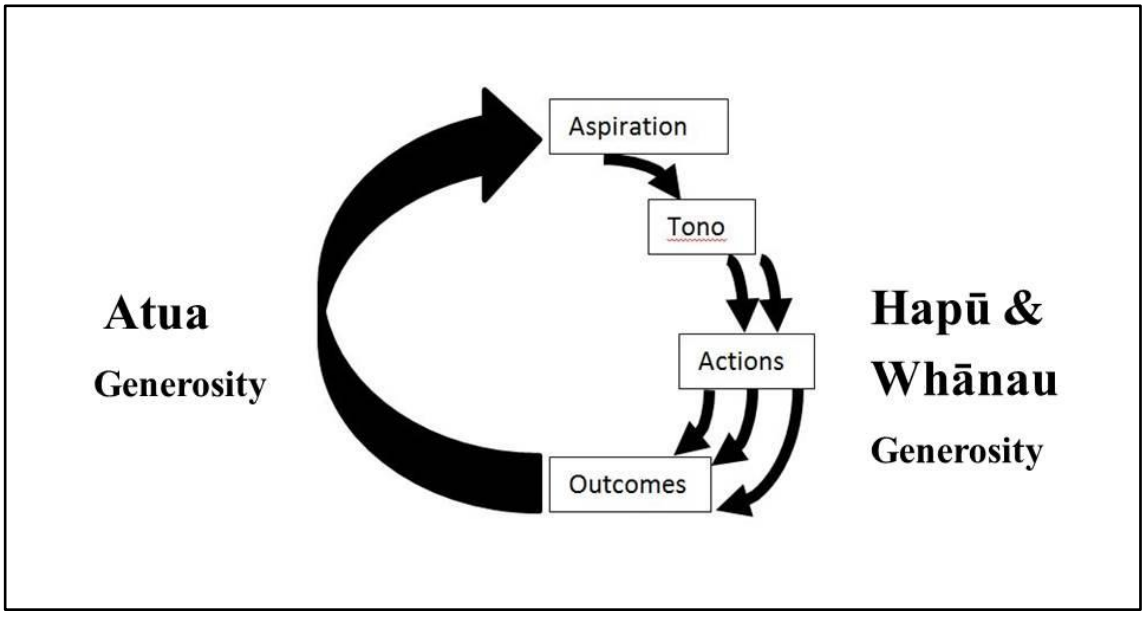

Figure 4.1.4 Cycle of generosity and reciprocity in the Lake Waiorongomai restoration project and doctoral research endeavour.

It is important to note at this point that other Māori cultural assessment models exist and can be used in a project context of this kind such as: the Cultural Health Index (CHI),[560]

[560] Tipa, G., 1999, Taieri River case study; Tipa, G., &Teirney, L., 2003a, A cultural health index for streams and waterways: indicators for recognising and expressing Māori values; Tipa, G., & Teirney, L., 2003b, Mauri and Mahinga kai Indicators Project: Final report – developing the Cultural Health Index; Tipa, G., & Teirney, L., 2006a, A cultural health index for streams and waterways: a tool for nationwide use; Tipa, G., & Teirney, L., 2006b, Using the Cultural Health Index: How to assess the health of streams and waterways; Townsend, C., *et al.,* 2004, Development of a tool to facilitate participation of Māori in

Māori wetland indicators,[561] and the Mauri Model[562]. These models were considered by whānau and hapū, but not selected for this research endeavour.

4.1.5 Rationale associated with target audience in the writing of this thesis

The blending together of western science and kaupapa Māori research traditions in one project was not without challenges. This sub-section explores the diverse range of research lenses that various readers may bring to this doctoral thesis. It seeks to shed light on the rationale behind the writing of this doctoral thesis. The theoretical and visual analysis used in this sub-section are based on work by Anthony Cole, who developed this technique as a problem solving tool for understanding stakeholder preferences associated with participatory and mediated modelling research.[563] In my application of this analytical technique, I have used this approach to visually represent the well-known worldview preferences associated with the various audiences who are likely to engage with this thesis. In the following descriptions, I visually depict the generalised 'reader' research lenses of target audiences as a theoretical exercise and then finally bring them together in one composite visual illustration. The purpose is to show how this thesis may be understood differently by different readers.

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the management of stream and river health; Harmsworth, G., *et al.*, 2011, Linkages between cultural and scientific indicators of river and stream health.

[561] Harmsworth, G., 2002, Coordinated monitoring of New Zealand wetlands, phase 2, goal 2: Māori environmental performance indicators for wetland condition and trend; Jollands, N., & Harmsworth, G., 2007, Participation of indigenous groups in sustainable development monitoring: Rationale and examples from New Zealand.

[562] Morgan, T., 2003, The sustainable evaluation of the provision of urban infrastructure alternatives using the tangata whenua mauri model within the smart growth sub-region; Morgan, T., 2006a, An indigenous perspective on water recycling; Morgan, T., 2006b, Decision-support tools and the indigenous paradigm; Morgan, T., 2007, Translating values and concepts into a decision making framework: application o the mauri model for integrated performance indicator assessment.

[563] Cole, A., 17 December 2006, Powerpoint presentation: Transdisciplinary economics, dual logic, cultural survival and the interruption of cultural collapse - can we please make room for an economics of generosity? For the Ninth biennial conference of the International Society for Ecological Economics on 'Ecological Sustainability and Human Well-being' at New Delhi, India, Slides 13-20, 37-38; Cole, A., 2007, Catchment futures modelling, transdisciplinarity, dual logic, a local sustainability problématique and the achilles-heel of western science, pp. 30-31.

4.1.5.1 The 'reader' preferences of Ngā Hapū o Ōtaki

I have prioritised the whānau and hapū of Lake Waiorongomai as the first main 'reader' of this thesis in line with the principle that kaupapa Māori research should primarily benefit Māori communities. This thesis will provide whānau and hapū the opportunity to reflect on their Lake Waiorongomai restoration project activities and experiences as well as historic documentation for future generations. Kaumātua guidance suggested that it would not be hapū and whānau preference to read western academic and/or scientific publications.[564] Their assumed preferences are illustrated in Figure 4.1.5.

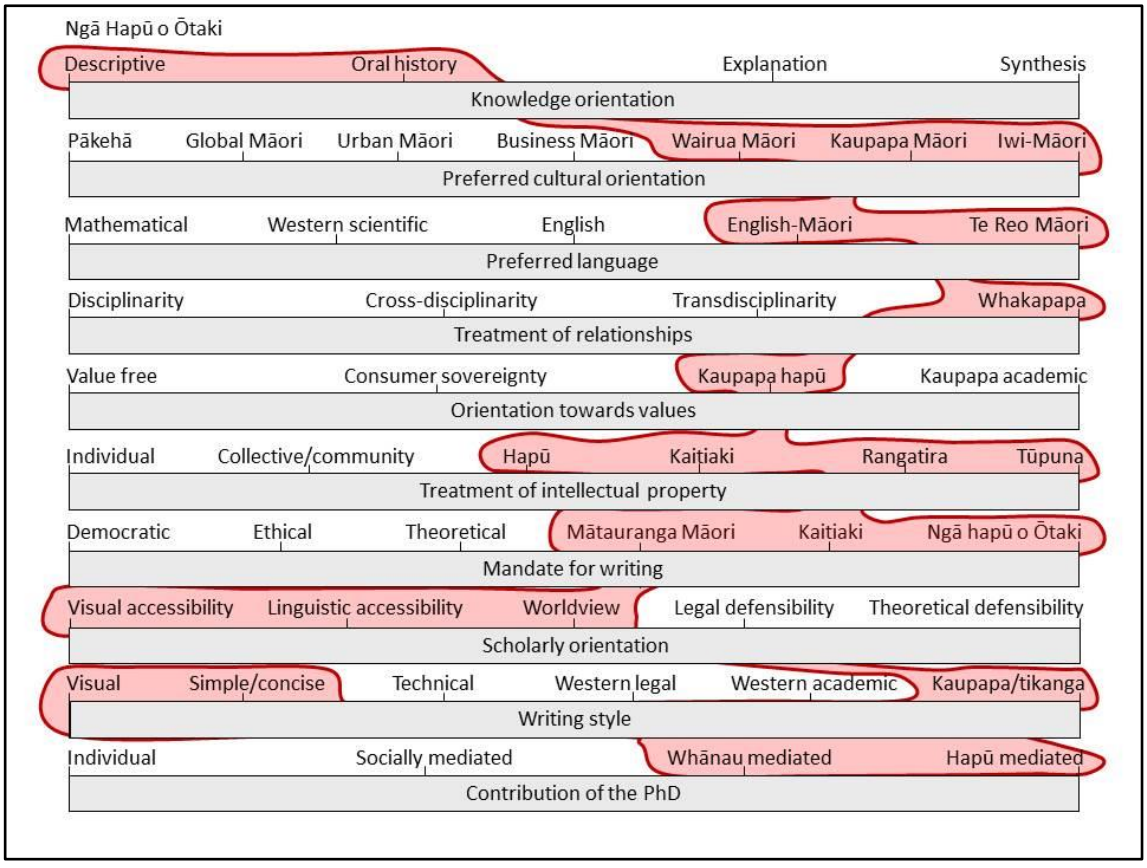

Figure 4.1.5 A visual depiction of the various doctoral thesis 'reader' assumed general preferences of Ngā Hapū o Ōtaki

[564] T. Carkeek, personal communication , 1 August 2013.

4.1.5.2 The generalised 'reader' preferences of western academia

The first readers of this thesis will be the doctoral research examiners engaged by a western academic institute. Therefore this thesis needs to be theoretically and academically defensible and consistent with well-established conventions used in western academia. A visual representation of western academia preferences are depicted in Figure 4.1.6.

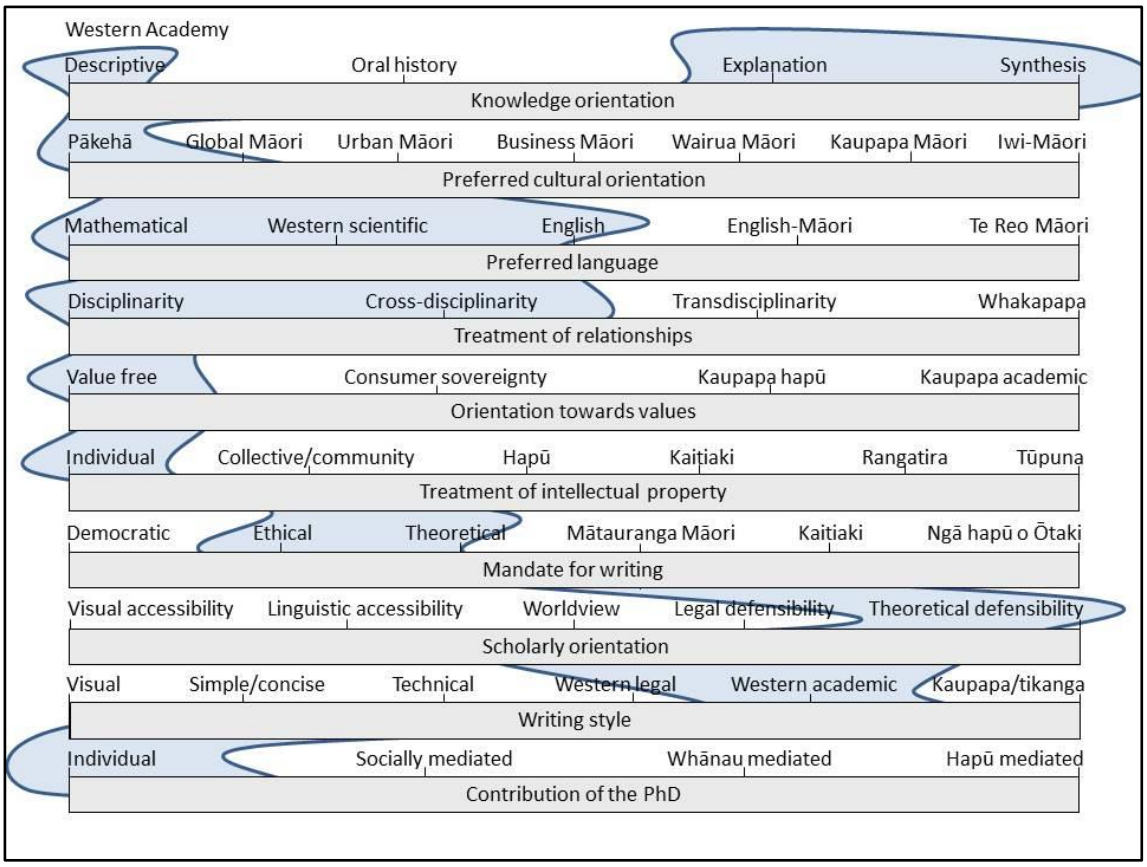

Figure 4.1.6 A visual depiction of the various doctoral thesis 'reader' general preferences of assumed doctoral research examiners of this doctoral thesis

4.1.5.3 The 'reader' preferences of environmental planners and policy makers

This thesis is intended as a scholarly, Māori cultural contribution to the academic discipline of resource and environmental planning. The preferences of this audience are both scholarly and primarily focused on theoretical contributions to the 'real-world'

challenges of planning practice. Because of their legislative responsibilities under the Resource Management Act 1991 planner and policy makers in New Zealand are required to include Māori communities and businesses as integral to their community-based planning and policy making activities. Despite this fact, it is still the exception rather than the rule to find planners and policy makers who are both competent and confident at working in a Māori cultural space. Thus, despite the somewhat academic and professional 'reader' preferences of this group, this thesis aims to provide a scholarly insight into the 'real-world' working of hapū-led environmental planning activities. A visual representation of 'reader' preferences of planners and policy makers are depicted in Figure 4.1.7.

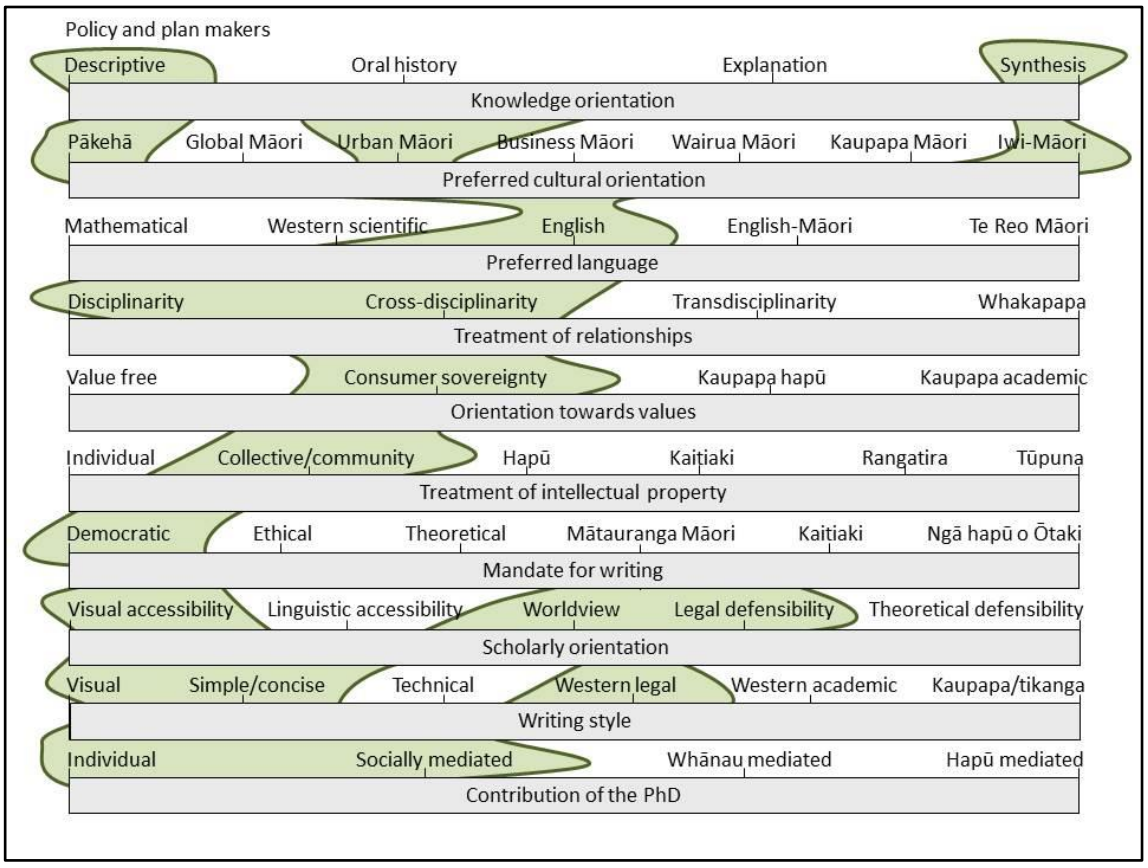

Figure 4.1.7 A visual depiction of the various doctoral thesis 'reader' assumed general preferences of policy and planners

4.1.5.4 The 'reader' preferences of Māori pūkenga in the western academy

The hapū-led case study and kaupapa Māori research orientation of this thesis will be on interest to Māori pūkenga (scholars) in the western academy. While this group of scholars tend to share the academic preferences of planners and policy makers, they are by contrast, primarily interested in written contributions to mātauranga Māori. Thus, this group of reader preferences, while competent in the theories and vocab of western science, largely prefer written scholarship that also enriches their understanding of Te Ao Māori and the use of the Māori language. The visual representation of the 'reader' preferences of Māori scholars within the western academy are depicted in Figure 4.1.8.

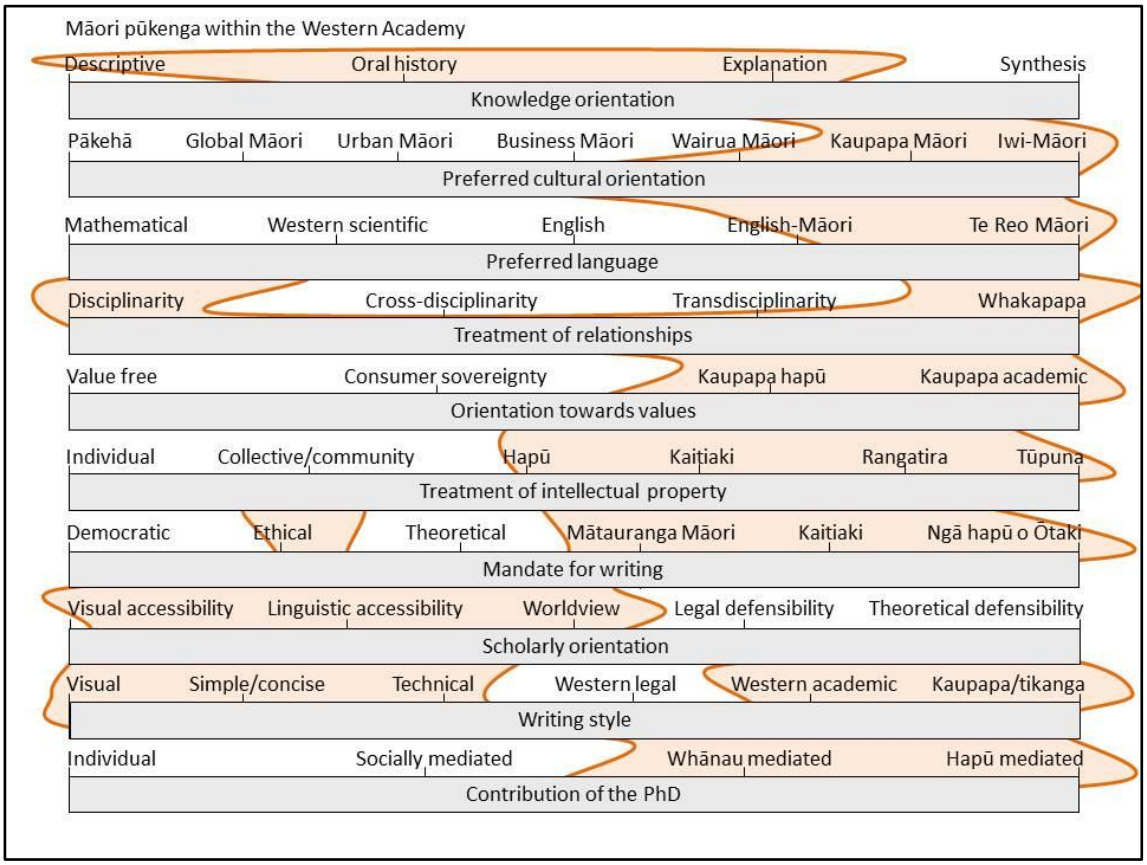

Figure 4.1.8 A visual depiction of the various doctoral thesis 'reader' assumed general preferences of Māori scholars in the western academy

4.1.5.5 The 'reader' preferences of Māori pūkenga within whare wānanga

It is not accurate to assume that the 'reader' preferences of Māori pūkenga[565] within the western academy are the same as those Māori pūkenga who study and work within whare wānanga[566]. This distinction is especially relevant because of the role of staff and students from Te Wānanga o Raukawa[567] in this hapū-led lake ecosystem restoration project. Māori pūkenga who work within whare wānanga do so primarily because they desire to be immersed in a Māori community that fully embraces the use of the Māori language and tikanga. They often are also passionate about contributing to the development and success of tikanga Māori educational organisations. Thus, the primary focus and 'reader' preference of this group is on celebrating the use of the Māori language in written scholarship and seeing the world through Māori eyes. The generalised visual representation of the 'reader' preferences of Māori scholars within whare wānanga are depicted in Figure 4.1.9.

[565] Scholars.
[566] Māori tertiary institute.
[567] Local whare wānanga in Ōtaki.

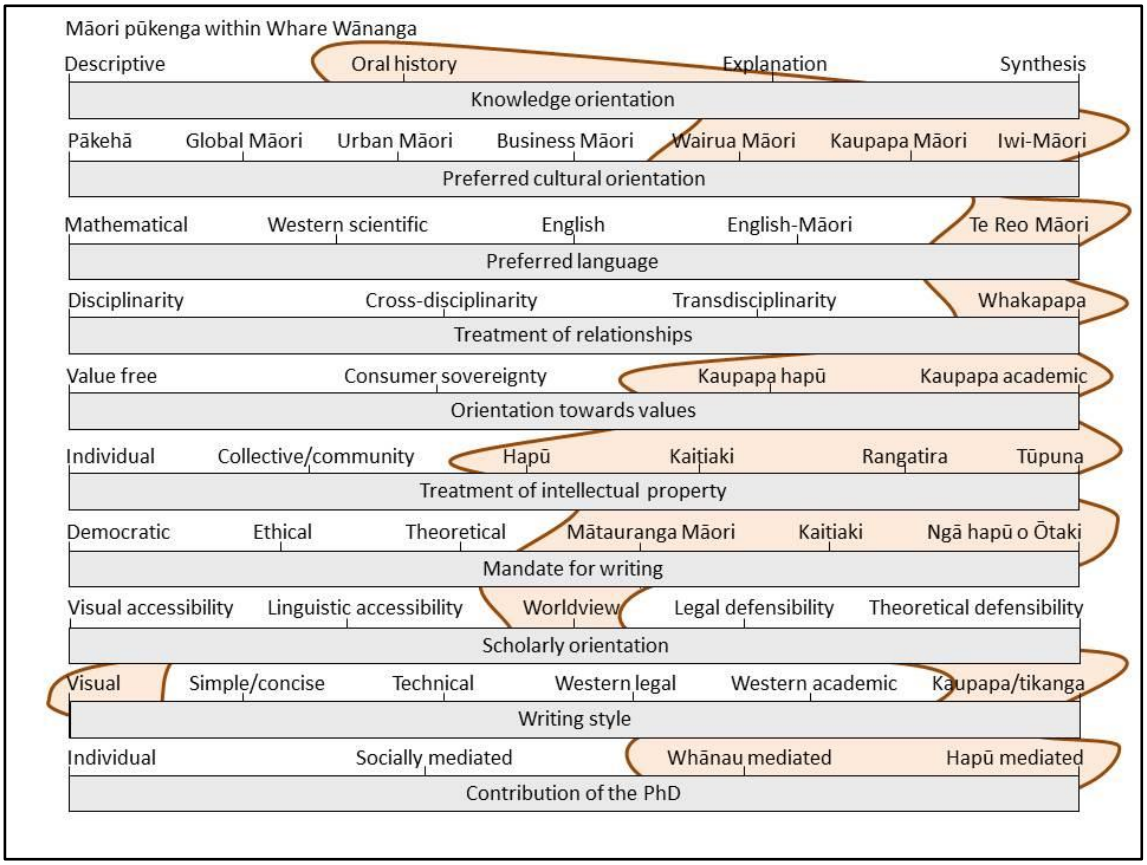

Figure 4.1.9 A visual depiction of the various doctoral thesis 'reader' assumed general preferences of Māori pūkenga in whare wānanga

4.1.5.6 The challenge of academic writing in a cross-cultural context

The rationale behind the choice of writing in a cross-cultural context for this thesis may not be immediately evident to all readers. For this reason, I felt that it was important to be explicit about both the challenge of academic writing in a cross-cultural context involving mātauranga Māori and the rationale on which the writing of this thesis has been undertaken. Figures 4.1.5 – 4.1.9 provide a visual, problem solving approach to understanding the many and varied audiences who are likely to read this thesis. While each of these individual illustrations are interesting in their own right, they are presented in this sub-section as a contribution towards the creation of Figure 4.1.10.

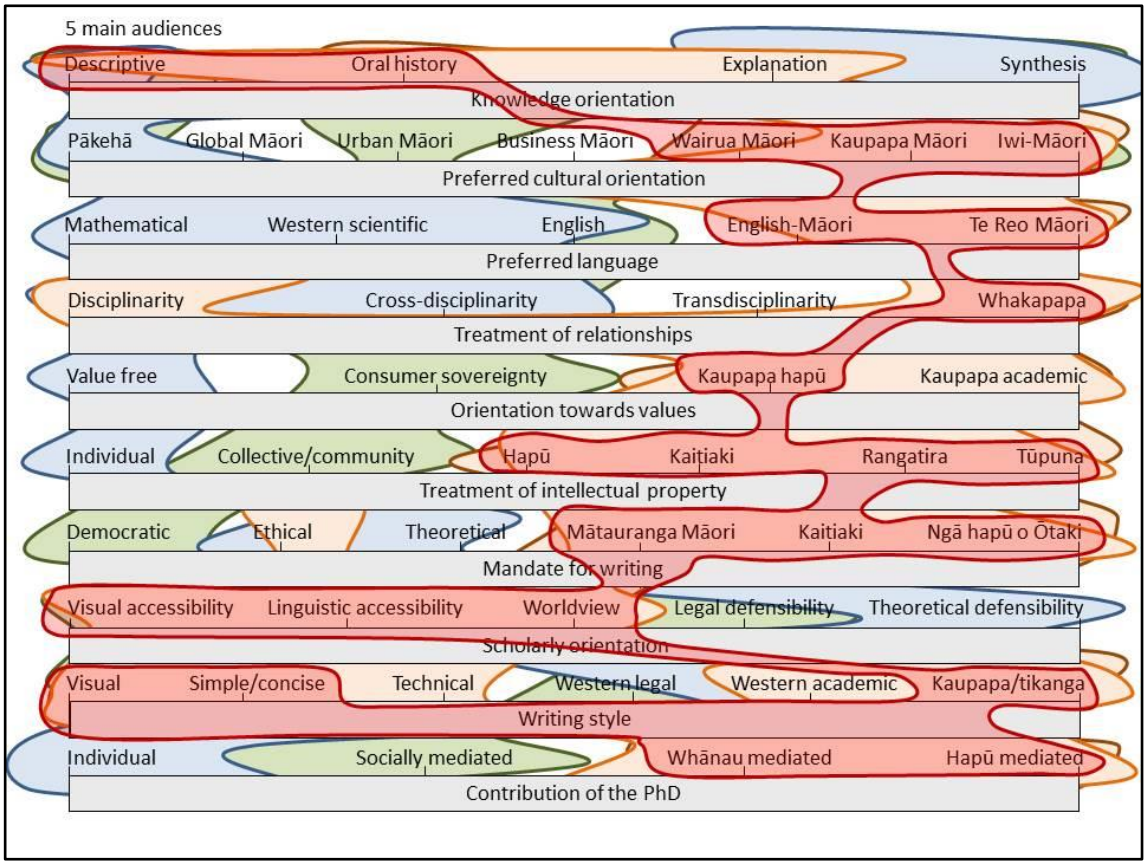

Figure 4.1.10 A visual depiction of the various doctoral thesis 'reader' assumed general preferences of the theoretical audiences that are likely to engage in reading this doctoral thesis

Figure 4.1.10 is a generalised visual depiction of the various thesis 'reader' preferences of the collective audience that is likely to engage in reading this doctoral thesis. There are a couple of important observations that emerge from Figure 4.1.10. First, by superimposing all of the individual visual depictions of 'reader' preferences on top of each other it is possible to create a visual depiction of the 'theoretical audience' potential of this doctoral thesis. Second, what this visual depiction of a 'theoretical audience' shows is that it is not possible to write this thesis in a way that effectively responds to all of the 'reader' preferences of all individual 'reader' groups. Some of the distinguishing characteristics used to define the categorical structure of Figure 4.1.10 are less problematic in this respect than others. For example, most readers, irrespective

of their preferences will be able to accommodate different styles of academic writing (i.e. descriptive, oral history, explanatory and synthesis). However, in general Māori communities are unlikely to preference a writing style that employs difficult academic vocabulary. Other distinguishing characteristics are more problematic. For example, hapū and whānau are likely to have very firm preferences in regards to intellectual property, whereas in a western academic context there is an implicit assumption that all knowing should be accessible.

Given that it is simply not possible for this doctoral thesis to be all things to all readers, it is important to state the rationale on which the writing of this doctoral thesis is based. First, every effort has been made to accommodate the preferences of the target reader groups. Second, because this doctoral thesis is subject to a doctoral examination process within a western university context, it has been necessary to ensure that appropriate academic structure and writing conventions have been followed. These writing conventions are not always consistent with a kaupapa Māori orientation. Thus, an effort has been made to accommodate the need to provide evidence of academic scholarship while appropriately representing Māori cultural knowledge tradition. In accordance with Māori cultural traditions there is also usually a preference for oral reporting[568] of research findings as well.

Further to describing the Lake Waiorongomai restoration journey this thesis explains the knowledge and tikanga development results in a holistic Māori knowledge development context that goes beyond disciplines. It reflects on examples within the case study of the similarities and differences between kaupapa Māori and action research approaches. My intent was to contribute to the field of action research as well as legitimising kaupapa Māori research as a valid approach to planning practice 'on-the-

[568] Powerpoint presentations at marae.

ground'.[569] As noted above, scholarship of this kind provides a 'real-world' window through which planners and policy-makers can safely venture into a Māori world, in a way that provides opportunity to gain confidence and understanding about how to work and contribute to the needs of Māori communities.

Beyond what is outlined in this thesis audience sub-section, other readers may also include the general public or other indigenous scholars within communities conducting environmental projects or action research. Modern ecologists may be interested in aspects of this doctoral research too and use it to support Māori values and iwi/hapū/whānau aspirations. The creative visual activities used within this case may ignite the imaginations of arts and education domains. The Lake Waiorongomai restoration project and doctoral research endeavour was led first and foremost by hapū, then supported by iwi, western science, the western academy, the Māori academy and kaupapa Māori educational organisations. In many ways it contributes towards the benefit and cultural survival of whānau, hapū, iwi Māori.

4.1.6 Why not use an action research methodology?

In a resource and environmental planning context, action research would be an appropriate methodology to use in a socially-mediated and social-environmental problem context of this kind. An action research methodology has many similarities to a kaupapa Māori approach, especially given the social complexity and focus of this case study to support restoration activities for a dune lake ecosystem. Therefore this is an important question to address – *why not use an action research methodology?* For this reason a literature review has been included in this chapter to outline the essential characteristics of an action research approach (Section 4.3).

[569] Described in Chapter 6.

There are notable differences between a kaupapa Māori research and action research. One significant limitation of action research is that the body of theory and emerging best practice methods have primarily been shaped by a western scientific knowledge tradition. Whereas this case study ideally needed a research framework (i.e. kaupapa Māori) that provided the whānau and hapū a culturally safe environment and had proven success when applied in a Māori cultural context. Thus, this doctoral thesis provides an opportunity to better understand how kaupapa Māori research can be applied in a way that contributes towards enriching an action research approach. This thesis creates the opportunity for contrasts and comparisons on kaupapa Māori research and action research theory (Section 4.4) and best practice methods (Chapter 6 in particular Section 6.5) in collaborative environmental projects that aspire to create transformative change.

4.2 Historical emergence of kaupapa Māori research methodology

Kaupapa Māori research theory was first developed in New Zealand academia as direct response to: (i) the discontent of Māori underachieving in the field of education; as well as (ii) Pākehā dominance within New Zealand academic and professional research sectors.[570] Māori educators and academics described intense dissatisfaction with the New Zealand educational research processes as they did not provide for Māori cultural perspectives. This section provides a chronology of publications and a list of authors who contributed to the emergence of 'kaupapa Māori research' as a methodology and approach to research. That led to the definition and use of the academic term 'kaupapa Māori research'.[571]

[570] Pihama, *et al.*, 2002; Smith, G., 1997; Smith, L., 1999; Stokes, E., 1985, Māori research and development discussion paper, pp. 3-4.
[571] Papers by Linda Smith, Graham Smith, Evelyn Stokes, Toby Curtis, Ranginui Walker. In Hohepa & Smith (Eds.), 1992.

The cultural revitalisation of Māori gained political momentum in the 1970s and 1980s as Māori took a philosophical and productive educational stance against the failing state system.[572] The political stance of Māori on resisting Pākehā educational strategies was led by prominent Māori representative organisations such as the NZ Māori Council, the Māori Congress, Māori Health and Welfare bodies, Iwi authorities and more recently the political Māori Party.[573] The Māori education sector gained momentum using a kaupapa Māori approach to establish Te Kohanga Reo[574], then later Kura Kaupapa Māori[575], Wharekura[576], and Wānanga Māori[577].

The concept of Kaupapa Māori as an educational approach was primarily based on 'tino rangatiratanga' - self-determination of Māori by Māori.[578] The Kura Kaupapa Māori movement also had a collective community vision based on local aspirations of excellence in Māori education.[579] Learning in a Māori environment provided the opportunity for Māori to participate in education as Māori and to educate their children on their own terms.[580]

In 1985, the Secretary and staff of the Department of Māori Affairs met with the National Research Advisory Council - Social Sciences Committee to discuss their growing concern that numerous social science researchers lacked knowledge and sensitivity in regards to Māori culture and their values.[581] The meeting led to Evelyn

[572] Bishop, R., 2008b, Te Kotahitanga: Kaupapa Māori in mainstream classrooms, p. 439.
[573] Ibid, pp. 439-440.
[574] Meaning language nests the name given to te reo Māori medium preschools.
[575] Māori medium schools.
[576] Māori medium secondary schools.
[577] Māori tertiary institutions. Also known as Whare Wānanga.
[578] Bishop, R., 1996b, Collaborative research stories: Whakawhanaungatanga; Durie, M., 1995b; Durie, M., 1998; Pihama, *et al.*, 2002; Smith, G., 1997; Smith, L., 1999.
[579] Bishop, 2008b, p. 444.
[580] Ibid, p. 457.
[581] B. Jamieson, personal communication, the Acting Chairman of the Social Sciences Committee letter to the Executive Director of the National Research Advisory Council, Wellington. Cited in Stokes, 1985, pre-face.

Stokes[582] writing a discussion paper on '*Māori research and development*'.[583] She highlighted that general Māori perceptions towards social science research at the time were as follows: (i) that there were a lack of Māori research practitioners; (ii) that social science practitioners (including those that were Māori) were constrained within Pākehā methodologies and institutional criteria; (iii) that the dominant use of Pākehā research approaches offered little in the way of positive benefits for Māori; (iv) that western science approaches were merely descriptive - telling Māori what they already knew; and (v) that written research outputs only reinforced negative stereotypes of Māori.[584] There was a general perception that there was very little benefit, if any, for Māori communities who engaged in social science research. By pointing out the differences between Māori and non-Māori knowledge transfer, worldviews, and roles in knowledge development, Evelyn Stokes argued for the need for Māori research.

Evelyn Stokes proposed that what she called "Māori Research" be based on Māori cultural values, perspectives and language; recommending that Māori researchers be bicultural and interdisciplinary in their approaches to research.[585] She argued that training future Māori researchers in this way would lead to the indigenisation of research based on an assumption that "the primary audience for the research is the people being researched, not one's academic colleagues."[586] Her request to society and the field of social science was "by all means, let us work out our own solutions to our own problems."[587]

[582] A National Research Advisory Council - Social Sciences Committee member, also working at the University of Waikato.
[583] Stokes, 1985.
[584] Ibid, pp. 3-4.
[585] Ibid, p. 19.
[586] Ibid, p. 10.
[587] Ibid, p. 19.

In 1990, research by Graham Smith[588] aimed at exploring how education policy and research method should develop in a culturally sensitive manner, particularly when researching Māori. According to Graham Smith kaupapa Māori theory and practice were actually used in the 1860's by Te Kooti[589] and Sir Apirana Ngata[590] in 1920.[591] The early general use of the term "kaupapa Māori" he described as Māori preferring to do "things" in a Māori cultural way, with the aid of a "kaupapa Māori stance".[592] This concept of localised Māori philosophy and principles as a theoretical position would help to ensure:

- the validity and legitimacy of Māori is taken for granted,
- the survival and revival of Māori language and Māori culture is imperative,
- the struggle for autonomy over our own cultural well being, and over our own lives is vital to Māori survival.[593]

Graham Smith critiqued educational research in New Zealand at the time as mostly irrelevant and inadequate to the needs of Māori, phrasing it as "a cultural rip off."[594] Māori were distrustful of educational research as it: (i) generalised crisis statements about Māori education; (ii) its primary purpose served Pākehā interests; and (iii) it most often answered what Pākehā people wanted to know based on their ideologies. Graham Smith and his colleagues' reflected on the need to incorporate local theory through what

[588] Graham Smith whilst working for the Education Department at the University of Auckland presented a paper to accompany his oral presentation at the New Zealand Association for Research in Education Special Interests Conference. The paper and presentation was based on an earlier collaborative Seminar Paper called 'The Business Round Table and the Privatisation of Education: Individualism and the Attack on Maori' by J. Marshall, M. Peters and G. Smith.
[589] Te Kooti Arikirangi Te Turuki – a Rongowhakaata and Ngāti Maru leader, military strategist, prophet and religious founder of the Ringatū faith. Arrested by the Government in 1865 as a spy he was later discharged for a lack of evidence.
[590] Āpirana Turupa Ngata – a Ngāti Porou prominent New Zealand politician and lawyer.
[591] Smith, G., 1992, Whakaoho whanau: New formations of whanau as an innovative intervention into Maori cultural and educational crisis, p. 22.
[592] Smith, G., 1992, p. 2.
[593] Ibid.
[594] Ibid, p. 3.

they termed a "kaupapa Māori stance".[595] Graham Smith emphasised that "Māori people want more control over research to ensure that their interests and integrity are protected and to ensure that such research is carried out in culturally appropriate ways, and for the 'right' reasons."[596]

Linda Smith wrote a paper in 1992 that addressed the question of that time "are Pākehā notions of research and associated methodologies of research capable of taking full account of Māori cultural perspectives?"[597] She accurately described the value of knowledge to Māori and touched on the influence of Pākehā and colonisation that eroded many aspects of Māori traditions, including the transmission of knowledge. Linda Smith supported a previous statement by Donna Awatere who, in 1984, had called for "more Māori researchers to be doing Māori research"[598] but pointed out it was not enough, especially if Māori researchers were still operating within a Pākehā dominated education system.[599] By 1995, Linda Smith defined kaupapa Māori research as "research by Māori, for Māori and with Māori".[600]

Also in the 1990s, Leonie Pihama was writing about kaupapa Māori education research. In her 1993 Masters thesis, she noted that kaupapa Māori theorising is "indigenous to Aotearoa and derives from both traditional and contemporary Maori knowledge forms which assert the validity and legitimacy of te reo and tikanga Maori".[601] She expressed that it was not a 'new' theory because it was grounded in te reo, tikanga and mātauranga Māori. She described Te Kohanga Reo and Kura Kaupapa Māori as proactive

[595] Ibid.
[596] Ibid, pp. 3-6.
[597] Smith, L., 1992, Te Raapunga I Te Ao Mārama: the search for the world of light paper, pp.7-8.
[598] Awatere, D., 1984, Māori Sovereignty. Cited in Smith, L., 1992, p. 3.
[599] Smith, L., 1992, p. 3.
[600] Smith, L., 1995, Toward Kaupapa Māori research. Cited in Henry, E., Keynote address chapter - Kaupapa Māori: Locating indigenous ontology, epistemology, and methodology in the academy, p. 10.
[601] Pihama, L., 1993, Tungia Te Ururua, Kia Tupu Whakaritorito Te Tupu o Te Harakeke: A critical analysis of parents as first teachers, p. 12.

movements that returned early childhood education for Māori to traditional practices of parents as first teachers. She commented that Māori at that time were withdrawing from mainstream Pākehā education and actively drawing upon their own cultural resources to provide Māori early childhood education. This, she argued, was a clear "act of resistance".[602] Through challenging dominant ideologies, she promoted the use of kaupapa Māori theory to "transform an oppressive reality… [of] unequal power relations between Pakeha and Maori".[603]

In 1997, Graham Smith published his doctoral thesis on '*The development of kaupapa Māori: theory and praxis*' in which he reported on progress that had been made in developing Kaupapa Māori theory and practice.[604] Drawing on fourteen years involvement in Kaupapa initiatives he defined kaupapa Māori theory as "primarily an educational strategy, which has evolved out of Māori communities as a deliberate means to comprehend, resist and transform the crises related to the dual concerns of schooling underachievement of Māori students and the ongoing erosion of Māori language, knowledge and culture as a result of colonisation."[605] Graham Smith theorised that kaupapa Māori theory aligns closely to critical theory.[606] First introduced in 1937 by Max Horkheimer, critical theory is a knowledge development rationale that differed from prevailing logical western scientific knowledge method. [607] In particular, it was based on both practice and reflection.

Graham Smith argued in his thesis that three components are essential for the practical application of kaupapa Māori strategies to result in positive transformative change. These were (i) conscientisation (revealing the reality); (ii) resistance (oppositional

[602] Ibid, p. 140.
[603] Ibid.
[604] Smith, G., 1997, p. 26.
[605] Ibid, p. 27.
[606] Ibid, p. 41.
[607] Peters, M., *et al.* (Ed's), 1996, Critical theory, poststructuralism and the social context, p. 9.

actions); and (iii) praxis (reflective change).[608] He introduced six key kaupapa Māori intervention elements in relation to Māori education: (i) tino rangatiratanga; (ii) taonga tuku iho; (iii) ako Māori; (iv) kia piki ake i ngā raruraru o te kāinga; (v) whānau; and (vi) kaupapa (for more detail refer to Table 4.2.1).[609] Graham Smith highlighted the difficulties of reflection to assess, measure and audit the transformative change of kaupapa Māori initiatives.[610] Thus he developed a matrix as a framework to quantify positive changes (Figure 4.2.1).

[608] Smith, G., 1997, p. 38.
[609] Ibid, pp. 465-472.
[610] Ibid, p. 489.

Table 4.2.1: Key intervention elements

Key intervention element	Brief description
Tino Rangatiratanga	The principle of self-determination reinforces the goal of seeking more meaningful control over one's own live and cultural well-being.
Taonga tuku iho	The cultural aspirations of Māori particularly in a wider societal context of the struggle for language and cultural survival, is more assured. Māori language, knowledge, culture and values are validated and legitimated.
Ako Māori	This culturally preferred principle promotes teaching and learning settings plus practices that closely connect to the cultural background and socio-economic circumstances of the Māori communities.
Kia piki ake i ngā raruraru o te kāinga	The socio-economic mediation principle focusses attention on the need to alleviate the negative pressures of the life circumstances of many Māori families which impacts on learning.
Whānau	The extended family structure principle is an important cultural structure. Thus the difficulties and emphasis on individuals is reduced and the collective responsibility of the extended family to assist and intervene is promoted.
Kaupapa	The collective philosophy principle embraces a shared community commitment to their values and vision.

(*Source: Smith, G., 1997, p. 438*)

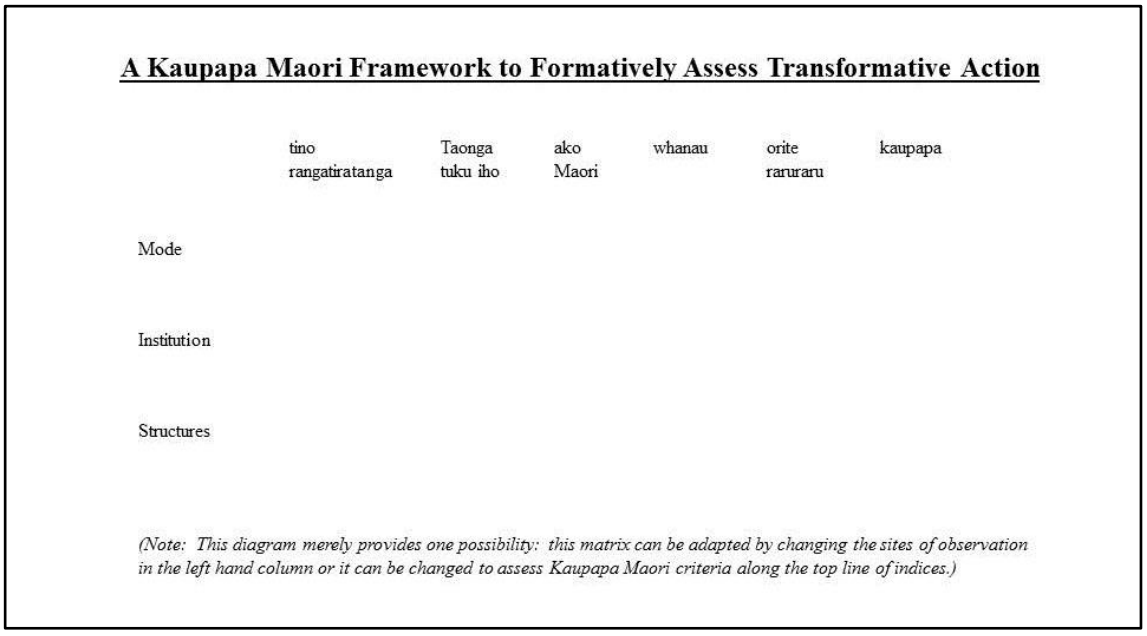

Figure 4.2.1 Kaupapa Māori research matrix *(Source: Smith, G., 1997, p. 491)*

Russell Bishop[611] is another Māori academic writing extensively in the 1990's on the subject of kaupapa Māori research from an education perspective.[612] He explored the idea of participatory involvement of kaupapa Māori researchers to support the Māori participants who should control the research process and progress towards their own, self-determined goals.[613] He also drew attention to the importance and best practice of kaupapa Māori practitioners in addressing research issues such as the initiation, benefit, representation, legitimation and accountability of research endeavours.[614] He recommended that Māori research participants determine evaluation criteria in accordance with their cultural values and practices.[615]

Russell Bishop's early contribution to the development of kaupapa Māori theory includes a participatory epistemological model.[616] This collaborative educational model was based on (i) the absence of control; (ii) the desire to be connected to the community; and (iii) the aim to have a compassionate understanding of the participants' moral position.[617] It is useful in evaluating researcher positioning.[618]

On the 12th July 1999, the New Zealand Council for Educational Research/Te Rūnanga o Aotearoa mō te Rangahau i te Mātauranga held a wānanga called '*Building the Research Capacity within Māori Communities*'. One of the key note speakers was Ella Henry, who suggested that the expanding field of kaupapa Māori research was founded

[611] Tainui, Ngāti Pukeko.
[612] Bishop, R., 1994, Initiating empowering research, pp. 175-188; Glynn, T., & Bishop, G., 1995, Cultural issues in educational research: A New Zealand perspective; Bishop, R., 1996a, Addressing issues of self determination and legitimation in kaupapa Māori research, pp. 143-160; Bishop, R., 1998, Freeing ourselves from neocolonial domination in research: A kaupapa Māori approach to creating knowledge, pp. 199-219; Bishop, R., 1999, Kaupapa Maori research: An indigenous approach to creating knowledge, pp. 1-8; Bishop, R., 2003, Changing power relations in education: Kaupapa Māori messages for 'mainstream' education in Aotearoa/New Zealand, pp. 221-238; Bishop, R., 2008a, Freeing ourselves from neocolonial domination in research: A kaupapa Māori approach to creating knowledge, pp. 145-183.
[613] Bishop, 1996a, p. 144; Bishop, 1999, p. 1.
[614] Bishop, 1996a, pp. 145-158.
[615] Bishop, 2008a, p. 170-171.
[616] Denzin, N., & Lincoln, Y., 2008a, Critical methodologies and indigenous inquiry, p. 11.
[617] Bishop, 1998, p. 203.
[618] Bishop, 2008a, p. 174.

on collective consciousness, and that this Māori cultural approach to knowledge development was beginning to be academically accepted as an indigenous research methodology within New Zealand.[619] She also noted that Māori intellectuals over the previous 20 years had been developing the theoretical concept of kaupapa Māori research from a position of resistance to colonial heritage and its domination in New Zealand. Thus, kaupapa Māori research, as a contemporary academic strategy was difficult to separate from the struggle for self-determination and the empowerment of Māori communities.[620]

Ella Henry's lecture and accompanying paper also pointed out, that early kaupapa Māori researchers were challenging western models of knowing in the fields of education, anthropology and law. At that time, her comments were supported by the fact that kaupapa Māori was gaining popularity in disciplines such as science, medicine and commerce.[621, 622] She highlighted the limitations of western science while not dismissing of the contributions that quantitative and qualitative research methods can produce for Māori. However, while making this allowance she emphasised the potential for knowledge development and research to more effectively represent traditional Māori worldviews while concurring with Waitere-Ang[623] and other authors, that: "kaupapa Māori is both a world view and a methodology."[624]

In the 1990's the ethics associated with Māori research and in particular kaupapa Māori research were addressed by authors such as Ngahuia Te Awekotuku[625], Fiona Cram[626],

[619] Henry, 2000, pp. 7-10.
[620] Ibid.
[621] Ibid, p.7.
[622] For example Glover, M., 1997, Kaupapa Maori health research: A developing discipline.
[623] Waitere-Ang, H., 1998, Methodological vertigo: The researcher as a socio-historically constructed phenomenon. Cited in Henry, 2000, p. 12.
[624] Henry, 2000, p. 12.
[625] Te Awekotuku, N., & Manatu, M., 1991, He Tikanga Whakaaro: Research ethics in the Māori community.

Eddie Durie[627,628], Manuka Henare[629] and Wheturangi Walsh-Tapiata[630]. Ngahuia Te Awekotuku identified a set of responsibilities that researchers have to Māori participants, based on the code of conduct for the New Zealand Association of Social Anthropologists, (which was based on the American Anthropological Association's guidelines).[631] In 1993, Fiona Cram wrote an early piece on the ethics involved in Māori research. She emphasised that a researcher's main role is to acquire knowledge for Māori and to uphold that knowledge, for the interest and mana (authority) of the collective community.[632] She cautioned researchers against using the research process to better their own status and instead encouraged them to use knowledge gained for the benefit of Māori people (in general) and/or the specific iwi involved. She continued to write journal articles (with co-authors also) that related to the subject of ethics within indigenous research, kaupapa Māori research, qualitative data collection and "researching your relatives."[633]

Mason Durie[634] edited a special edition of 'He pukenga kōrero' which was dedicated to the Te Oru Rangahau Māori Research and Development Conference, held 7-9 July 1998 at Massey University.[635] He included a piece he wrote that summarised the proceedings and includes the 'Te Oru Rangahau Framework' for Māori research and development (Figure 4.2.2). The framework has eight strategic goals. As seen in the illustration

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[626] Cram, F., 1993, Ethics in Maori research pp. 31-33.
[627] Iwi member: Ngāti Raukawa ki te Tonga, Ngāti Kauwhata and Rangitāne whakapapa connections.
[628] Durie, E., 1998, Ethics and values in Māori research, pp. 19-25.
[629] Henare, M., 1995, Human Labour as a commodity Māori ethical response. Cited in V. Tapine (Compiler), pp. 9, 22 & 24.
[630] Walsh-Tapiata, W., 1998, Research within your own iwi: What are some of the issues? Cited in V. Tapine (Compiler), pp. 12, 23 & 26.
[631] Smith, L., 2012, Decolonizing methodologies: Research and indigenous people, p. 124
[632] Cram, 1993, pp. 31-35.
[633] Pipi, K., *et al.*, 2004, A research ethic for studying Māori and iwi provider success, pp. 141-154; Cram, F., 2006, Talking ourselves up, pp. 28-43; Ormond, A., *et al.*, 2006, Researching our relations: Reflections on ethics and marginalisation, pp. 174-191; Kennedy, V., & Cram F., 2010, Ethics of researching with whānau collectives.
[634] Iwi member: Ngāti Raukawa ki te Tonga, Ngāti Kauwhata and Rangitāne whakapapa connections.
[635] At the time Professor of Te Pūtahi-ā-Toi: Māori studies at Massey University.

below, the framework spelt out the key themes of the conference encouraging Māori in the fields of research and development.

Te Oru Rangahau framework for Māori research and development	
Māori Development Outcomes	Strategic Research Goals
T ino rangatiratanga E quity and social well-being O utcomes linked to a secure Māori identity R esource development & economic growth U niversality.	R etention, transmission & development of old and new knowledge A code of ethics N ational focus for Māori research and development G eneration of evidence based policies and ractices A nalysis based on Māori frameworks H uman resource development A lliances between disciplines, sectors, and communities of interest U se of multiple methodologies.

Figure 4.2.2 Te Oru Rangahau framework for Māori research and development *(Source: Durie, E., 1998, p. 83)*

Mason Durie's brother Eddie Durie[636] also presented at the conference proceedings on the need for a code of ethics appropriate for Māori research.[637] Eddie Durie provided advice for Māori researchers relating aspects of research that contribute to our cultural values, traditions and the aim of cultural survival. In his opinion, criticism of Pākehā contributions was not justified.[638] He called for collaboration between traditional and academic approaches and urged that there was an additional need for sound Māori scholarship. Finally, he supported the need for a code of ethics for Māori research "as a guide and a shield from criticism."[639]

[636] At the time a High Court Judge and the Chief Judge of the Māori Land Court.
[637] Durie, E., 1998, pp. 19-25.
[638] Durie, E., 1998, p. 23.
[639] Ibid, p. 25.

Manuka Henare developed an ethical framework for Kaupapa Māori Research in 1998. He named it the 'Koru of Māori Ethics' (Figure 4.2.3).[640] A koru is a form of pitau (or shoot) in Māori design. It appears here as a spiral[641] that symbolises the "latent and potential energy, the life principle, light and enlightenment."[642] This concept comes from a Māori worldview and highlights kaupapa of significance to Māori research participants.

Figure 4.2.3 Koru of Māori ethics *(Source: Henare, M., 1998. In E. Henry, 2000, p. 22)*

In the same year Wheturangi Walsh-Tapiata developed a list of 'Kaupapa Māori Ethical Issues' as presented in the table below (Table 4.2.2).[643, 644] These ethical issues, which

[640] Henare, M., 1998, Te Tangata, te taonga, te hau: Māori concepts of property. Cited in Henry, 2000, p. 22.
[641] A koru is a Māori design motif emerging from kowhaiwhai. Spirals are different design elements in Māori visual language, with a range of different names. H. Smith, personal communication, 25 November 2017.
[642] Henare, M., 1995, Human Labour as a commodity Māori ethical response. Cited in V. Tapine (Compiler), p. 8.
[643] Walsh-Tapiata, W., 2000, Research within your own iwi: What are some of the issues? Cited in Henry, 2000, p. 23.

Wheturangi Walsh-Tapiata outlined in a paper titled "Research within your own iwi: What are some of the issues?" were all directly relevant to and were applied within this doctoral research endeavour.

Table 4.2.2 Kaupapa Māori ethical issues

Aroha ki te tangata	Respect of the people
Kanohi kitea	The seen face, present yourself face to face
Titiro, whakarongo, korero	Look, listen, speak
Manaki ki te tangata	Share and host people, be generous
Kaua e takahia te mana o te tangata	Do not trample on the mana of the people
Kia tupato	Be cautious, in terms of confidentiality and protection of both researcher and researched
Mahaki	Don't flaunt your knowledge, as academic institutions encourage you to promote yourself

(*Source: Walsh-Tapiata, W., 1998, p. 23*)

In 1999 Linda Smith published *Decolonizing Methodologies*, which was dedicated to illustrating indigenous research struggles and which aimed to emancipate Māori and indigenous peoples from dominant western methodologies.[645] She also discussed emerging transformations, such as globally, indigenous peoples were shifting from being the subjects of research, to leading and conducting their own research based on their values. Linda Smith expanded the field of kaupapa Māori research to privilege indigenous concerns, indigenous practices and indigenous researchers. She introduced 'The Indigenous Research Agenda' as a social research methodology for indigenous peoples to liberate themselves from historical states of survival to healing from colonisation (Figure 4.2.4).

[644] Notably Linda Smith published a code of conduct for Māori researchers she mentioned that she created the list based on common cultural sayings spoken by Māori elders. Smith, L., 1999, p. 120. Potentially this set of ethics may have been a collaborative effort.
[645] Smith, L., 1999.

Figure 4.2.4 The indigenous research agenda (*Source: Smith, L., 1999, p. 117*)

Linda Smith spoke of the common practice within many indigenous communities for elders to be the first point of contact and indeed potential mentors for research.[646] This practice was expanded upon in this research case study as the whānau and hapū elected a kaitiaki team including elders and their expertise. They deemed this as appropriate for the active restoration project and for guiding the research. She discussed another point similar to this case study - reciprocity that: "through respect the place of everyone and everything in the universe is kept in balance and harmony."[647]

In 2000, Linda Smith extended the kaupapa Māori research theory further to include the following eight questions that a researcher should contemplate.[648] She declared that the

[646] Ibid, p. 137.
[647] Ibid, p. 120.
[648] Smith, L., 2000, p. 239.

researcher must answer in the affirmative to ensure the Māori participants conduct, own and benefit from any research that is done on, for, or with them.

- What research do we want done?
- Whom is it for?
- What difference will it make?
- Who will carry it out?
- How do we want the research done?
- How will we know it is worthwhile?
- Who will own the research?
- Who will benefit?

In their varied research and literary contributions, Graham Smith and Linda Smith have since outlined the challenges that kaupapa Māori research as a methodology was confronting in the areas of science and democracy, and within communities.[649] They recommended that indigenists be proactive; craft their own version of science and empirical activity (including how science and scientific understandings will be used in their world); use theory proactively as an agent of change; while acting in ways that are accountable to the indigenous community and not just the academy; resist new forms of colonisation; and contest neocolonial efforts to commodify indigenous knowledge. To this end, Graham Smith suggested that indigenists develop a participatory model of democracy that goes beyond the "Westminister 'one person, one vote, majority rule.'"[650] These authors do not exclude non-Māori knowledge, methods or researchers from kaupapa Māori research but stipulate that the research project be Māori led, for the principal benefit of Māori participants and based on Māori worldviews.

[649] Smith, G., 2000, Protecting and respecting indigenous knowledge, pp. 212-215; Smith, L., 2000, pp. 225-247.
[650] Ibid, pp. 209-224. Cited in Denzin & Lincoln, 2008a , p. 10.

There has been considerable debate amongst Māori intellectuals within kaupapa Māori research literature on Māori research only being conducted by Māori. Linda Smith declared that "being Māori is an essential criterion for carrying out Kaupapa Māori Research."[651] In contrast Ella Henry and Hone Pene wrote a paper in 1999 that refuted the assumption that non-Māori research is not necessarily conducted in a manner to disempower, objectify and further alienate Māori from our aspirations of self-determination.[652] They claimed that this was not so in all cases. They referred to researchers who worked closely with Māori communities. In summary, their challenge to mainstream education institutes and the New Zealand academy was to accept kaupapa Māori research in the 21st century, as it promotes:

- The ongoing creation and maintenance of space in which intellectual traditions, which as seemingly oppositional to many of the 'sacred cows' of Western scholarship, can flourish, in parallel institutions operating alongside the mainstream;
- Power-sharing in the process of knowledge construction, its dissemination, and the consequent ownership and uses of the knowledge produced;
- The recognition that the academy has a role, as a location for 'decolonisation', and the development of counter-hegemonies, not just to pay lip-service to alternative ways of knowing and being, but to embrace and celebrate them;
- These issues of empowerment for minority voices, acknowledgement of alternative world views, and broadening of the intellectual domain continue to be addressed across cultures, nations and institutions in a variety of ways.[653]

Ella Henry and Hone Pene concluded that "power sharing is as important in the intellectual domain as it is in the political domain."[654] Similarly, in 2005 Russell

[651] Smith, L., 2000, pp. 229-230.
[652] Henry, E., & Pene, H., 1999, Re-organising Knowledge, Transforming Institutions, Knowing, Knowledge and the university in the XXI Century. Cited in Henry, 2000, pp. 7, 20-21.
[653] Ibid.

Bishop promoted interconnectedness and the concept of whakawhanaungatanga and bringing everyone together was a key element of the success of kaupapa Māori research processes.[655] He acknowledged that conflicts exist within the western academy due to epistemological differences and ethical frameworks and that "indigenous scholars and native intellectuals are pressed to produce technical knowledge that conforms to Western standards of truth and validity."[656] Russell Bishop recommends that culturally responsive research practices such as kaupapa Māori research locates the power within the indigenous community. What are acceptable or not acceptable research practices is thus, defined by the indigenous community, to encourage self determination and empowerment.[657]

Similarly in 2000, Patrick Fitzsimons and Graham Smith wrote about kaupapa Māory theory as an example of indigenous cultural transformation. They argued that kaupapa Maori embodies a commitment to Māori ways of knowing and that as an initiative it also transforms culture. [658] They suggested that the approach can mutually benefit Māori as well as western academia (i.e. the philosophy of education), by including knowledge from both traditions.[659] As a mutually inclusive concept this aligns to the dual use of Māori and Pākehā methodologies and methods that influenced and contributed to knowledge development in this doctoral research endeavour.

From 1993 - 2002 a significant amount of literature existed on kaupapa Māori research and theory. Kiri Powick wrote a comprehensive literature review on related ethical

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[654] Ibid, p. 21.
[655] Durie, M., 1998, Strategic direction for Māori research, p. 82.
[656] Bishop, R. 2005, Freeing ourselves from neocolonial domination in research: A kaupapa Māori approach to creating knowledge. In N. Denzin & Y. Lincoln (Eds.), The SAGE handbook of qualitative research, 3rd edition, pp. 109-138. Cited in Denzin & Lincoln, 2008a, p. 6.
[657] Ibid.
[658] Fitzsimmons, P. & Smith, G., 2000, Philosophy and indigenous cultural transformation, p. 39.
[659] Ibid.

issues.[660] She advised on the subject of ethics as applied to researchers, supervisors, ethics committees and those involved in research on indigenous cultures. By definition she stated that: "For Māori, ethics is about tikanga."[661] Kaupapa Māori research in her opinion is thus validated not by western academic systems but in contrast by adhering to local Māori kawa[662] and tikanga as restricted by tapu[663].[664] She described the kaupapa Māori researcher's experience was a 'lived experience'. Kiri Powick pointed out the emergence of more localised research such as 'iwi-based research' that aimed to develop knowledge of a particular iwi, rather than Māori in general. Researchers were now often iwi members too.

In 2006, Shayne Walker, Anaru Eketone and Anita Gibbs co-authored a journal article describing kaupapa Māori research as a resistance and methodological strategy. Their paper encouraged Māori researchers and participants to "design, plan, gather data, analyse and write up the research."[665] They determined five main principles that formed a kaupapa Māori research framework: tino rangatiratanga, social justice, Māori world view, te reo Māori[666] and whanau.[667] The authors warned that kaupapa Māori research methodology takes time and that researchers must be thorough in maintaining respect for the participants throughout the process. They referred to the methodology as an 'empowerment-focussed-approach'[668] that had begun to restore the faith of Māori

[660] Powick, K., 2002, Māori research ethics: A literature review of the ethical issues and implications of kaupapa Māori research and research involving Māori for researchers, supervisors and ethics committees.
[661] Ibid, p. 23.
[662] Protocol.
[663] Sacred.
[664] These aspects were similar to those applied to the Lake Waiorongomai case study, as the research extended further to hapū and whānau level.
[665] Walker, S., *et al.*, 2006, An exploration of kaupapa Māori research, its principles, processes and applications, p. 333.
[666] The Māori language.
[667] Barnes, 2000, 2002; Bishop, 1996, 1999; Gibbs, 2001; Glover, 2002; Jahnke & Taiapa, 2003; Kiro, 2000; Pihama, *et al.*, 2002; Powick, 2003; G. Smith in Powick 2003; L. Smith 1999, 2003; Te Ariki & Spoonley, 1992; Walsh-Tapiata, 2003. Cited in Walker, S., *et al.*, 2006, pp. 333-335.
[668] Gibbs, 2001. Cited in Walker, S., *et al.*, 2006, p. 337.

people in research.[669] These authors likened some elements of kaupapa Māori research to 'participatory action research', the notable difference being that kaupapa Māori research has its own philosophy and a flexible strategy. Of relevance to the Waiorongomai experience and the research endeavour;

> The methods of data collection in kaupapa Māori research are not particular to Māori. In other words, getting the process right is the first consideration, and then answering the research question is the next. Answering the question may well draw upon westernized research designs, for example surveys and experiments. However, certain kinds of qualitative research, for example oral histories, narratives, and case studies, and methods like interviews and focus groups, fit more comfortably within a Māori way of doing. Any data collected from kaupapa Māori research do not become the 'property of the researcher'; rather, the data remain under collective guardianship, and the whānau support group may decide where they remain and who has access to them… When it comes to publishing, the whānau support group and other Māori may decide what is published and what is held back for private use only.[670]

In 2006, Anaru Eketone wrote the *Theoretical underpinnings of Kaupapa Māori directed practice*. He began by describing two theoretical perspectives of kaupapa Māori theory that are at times in opposition. The first viewpoint to emerge was based upon using cultural knowledge and values (for example the Kura Kaupapa Māori

[669] Walker, S., *et al.*, 2006, p. 342.
[670] Ibid, p. 336.

movement). It is often used within the community and is based upon "constructivism, where knowledge is validated through a social construct of the world - thus is located and specific."[671] The second viewpoint is that, kaupapa Māori theory has developed within the New Zealand academy as a philosophical approach, by challenging Western ways of knowing. This second theoretical position had similarities to critical theory, stemming "from the Marxist/socialist grand theoretical traditions seeking to challenge and transform oppressive structures."[672]

Anaru Eketone notes that weaknesses of a critical theory approach to kaupapa Māori is that it focuses on the negative. Furthermore, this is a modernist approach, one conscientised answer to the problem of bringing about social change for the problems we face, an approach that is not about us - but about them as the oppressors.[673] He advocates for native theory - a constructivist approach that integrates both theoretical positions that remain conducive to Māori development. Anaru Eketone quotes Kayla Russell in her definition of native theory as "the right of indigenous people to make sense of their time and place in this world."[674] This approach infers that indigenous people seek to move forward culturally within indigenous contexts. Similar to kaupapa Māori research, native theory does not require the west to acknowledge, research, record or validate their knowledge.

Anaru Eketone introduced the following model, which attempts to integrate native theory and critical theory into kaupapa Māori practice and research (Figure 4.2.5). He states that "from a native theory perspective, Kaupapa Māori is about the right of Māori and iwi to make sense of their time and place in this world to define themselves using

[671] Eketone, A., 2008, Theoretical underpinnings of kaupapa Māori directed practice, p. 1.
[672] Ibid.
[673] Ibid, p. 7.
[674] Russell, K., 2000, p. 10. Cited in Eketone, 2008, p. 7.

their own reference points as to what is of value and what processes are important. It is about Māori constructing their own theory, explanations and outcomes."[675]

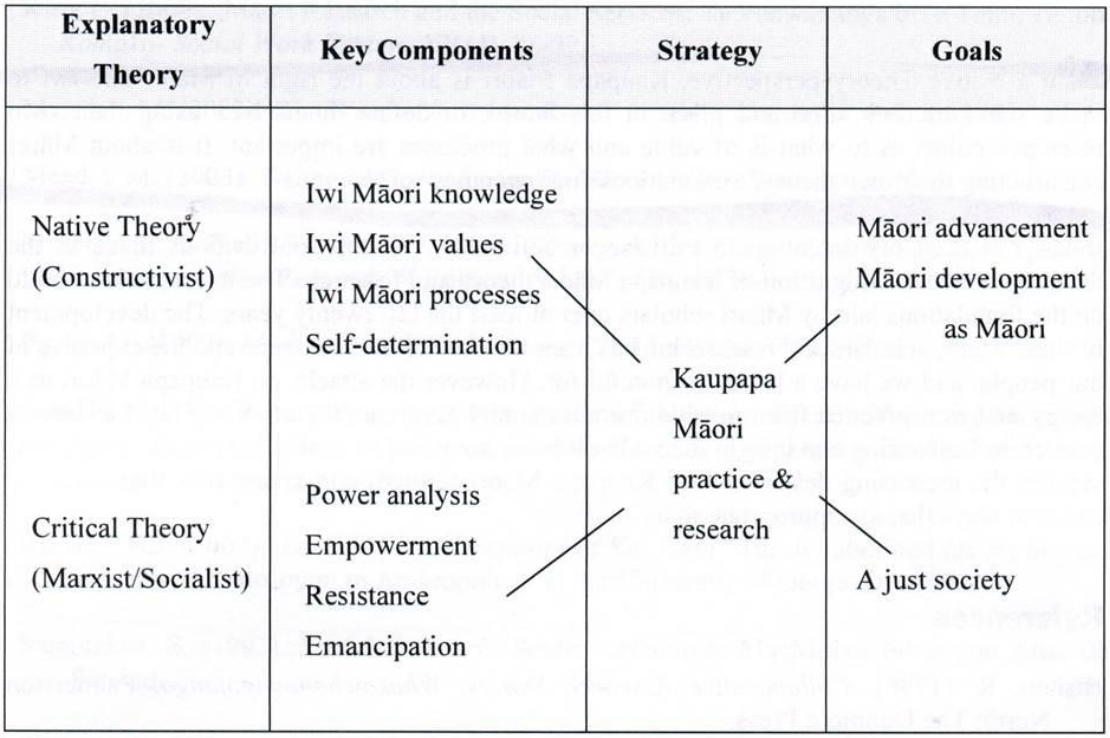

Figure 4.2.5 A preliminary model for the theoretical integration of kaupapa Māori practice (*Source: Eketone, A., 2008, p. 9*)

Within the last decade, kaupapa Māori research methodology has increased in popularity, a number of non-Māori academics are writing on the subject of kaupapa Māori research.[676] Although the debate continues as to the appropriateness of Pākehā participating in the field,[677] writers such as Graham Smith and Russell Bishop argue that

[675] Eketone, 2008, p. 10.
[676] Barnes, A., 2006, Taku ara, taku mahara: Pākehā family experiences of kaupapa Māori and bilingual Education; Barnes, A., 2013, What can Pākehā learn from engaging in kaupapa Māori educational research?; Hill, R., & May, S., 2013, Non-Indigenous researchers in indigenous language education: ethical implications; Jones, A., 2012, Dangerous liaisons: Pākehā, kaupapa Māori, and educational research; Woller, P., 2013, A culturally responsive methodology of relations: Kaupapa Māori research and the non-Māori researcher.
[677] Hoskins, T., & Jones, A., 2012, Introduction, pp. 3-9.

Pākehā can participate as long as they do not define, control or dictate the research.[678] Thus, the assumption remains that kaupapa Māori research is determined by Māori, for Māori values and based within a Māori cultural and worldview context.

Unfamiliarity with a kaupapa Māori research paradigm might leave some readers pondering how appropriate the use of non-Māori knowledge within or alongside a kaupapa Māori research approach is. There are a number of authors, papers and research projects/programmes that exist where the two are synonymous and recognised as complimentary.[679] Rangimarie Mahuika[680] supported this point: "kaupapa Māori is not about rejecting Pākehā knowledge. Instead it is about empowering Māori, hapū and iwi to carve out new possibilities, and to determine in their own ways, their past, present and future identities and lives."[681] This has been the case in the Lake Waiorongomai restoration project. To highlight this complementarity a few examples are provided as follows.

In 2006, Hayley Bell[682] utilised kaupapa Māori research in her Masters thesis that addressed decolonisation from the voice of Ngāti Raukawa ki te Tonga kaimahi[683] social workers.[684] She explored the impacts of colonisation to kaimahi whānau[685] and looked at facilitating the development of whakapapa and whakawātea[686]. She promoted that by exiting the dominant colonisation 'matrix'. Kaimahi whānau were able to

[678] Bishop, 1996; G. Smith in Powick, 2003. Cited in Walker, S., *et al.*, 2006, p. 335.
[679] Henry, 2000, pp. 18, 21. Hikuroa, D., *et al.*, 2011, Implementing Māori indigenous knowledge (mātauranga) in a scientific paradigm: Restoring the mauri to Te Kete Poutama, p. 1; Dure, M, 2004, Exploring the interface between science and indigenous knowledge, p. 8.
[680] Ngāti Rangiwewehi.
[681] Mahuika, R., 2008, Kaupapa Māori theory is critical and anti-colonial, p. 12.
[682] Iwi member: Ngāti Raukawa ki te Tonga.
[683] Workers.
[684] Bell, H., 2006, Exiting the matrix: Colonisation, decolonisation and social work in Aotearoa: Voices of Ngāti Raukawa ki te Tonga kaimahi whānau.
[685] Hayley Bell defined in her thesis that as she was related to the social worker participants she would refer to them as 'whānau kaimahi'. Literally the English meaning is 'family workers'.
[686] Cleanse.

develop "their own systems of support based on the traditions, values, skills and beliefs of their tūpuna."[687]

In her 2007 doctoral thesis from the University of Waikato, Georgina Stewart used a kaupapa Māori approach to investigate how Māori knowledge and language could develop pūtaiao or Māori-medium science education.[688] She has written a number of articles on this topic.[689] Similarly, in 2007 Kahurangi Waititi wrote a Masters Thesis at the same university that explored how kaupapa Māori processes apply to documentary filmmaking, particularly through practice-led research.[690]

In 2008, Helen Moewaka-Barnes' doctoral thesis at Massey University utilised a kaupapa Māori approach to explore challenges between Māori and western knowledge systems in the science field.[691] She promoted inclusive understandings of both knowledge systems could assist Māori and non-Māori engaged in collaborative research projects. Helen Moewaka-Barnes drew on her extensive research experiences and relevant writings in this area.[692]

Also in 2008, Tracey Gardner's masters thesis at the University of Otago, examined kaupapa Māori visual communication design and processes.[693] In 2014, Aneika Young

[687] Ibid, p. 146.
[688] Stewart, G., 2007a, Kaupapa Māori science.
[689] Stewart, G., 2005, Māori in the science curriculum: developments and possibilities, pp. 851-870; Stewart, G., 2007b, Narrative pedagogy for teaching and learning about the nature of pūtaiao (Māori-medium science), pp. 129-142; Stewart, G., 2011b, The extra strand of the Māori science curriculum, pp. 1175-1182; Stewart, G., 2011a, Science in the Māori-medium curriculum: assessment of policy outcomes in pūtaiao education, pp. 724-741; Stewart, G., 2014b, Te take kāhore ahau e tuhi rangahau ki te reo Māori, pp. 37-42; Stewart, G., 2014a, Kaupapa Māori, philosophy and schools, pp. 1270-1275; Stewart, G., *et al.*, 2015, Editorial introducing the Indigenous Philosophy Group (IPG), pp. 851-855.
[690] Kahurangi, W., Applying kaupapa Māori processes to documentary film.
[691] Moewaka-Barnes, H., 2008, Arguing for the spirit in the language of the mind: a Māori practitioner's view of research and science.
[692] Moewaka-Barnes, H., 2000a, Kaupapa maori: explaining the ordinary; Moewaka-Barnes, H., 2000b, Collaboration in community action: A successful partnership between indigenous communities and researchers; Moewaka-Barnes, H., 2003, Māori and evaluation: some issues to consider; Moewaka-Barnes, H., 2006, Transforming science how our structures limit innovation.
[693] Gardner, T., 2008, Kaupapa Māori (visual communication) design investigating 'visual communication design by Māori, for Māori', through practice, process and theory.

used a kaupapa Māori research approach within a cross-cultural project on ecosystems services as part of her Master of Environmental Studies thesis.[694] She explored the cultural values of two iwi (Ngāti Rārua and Te Ātiawa mo te tai o Aorere) for the Tasman Bay region using Grounded Theory to theme the interviews she conducted.

Our ancestors were inquisitive, innovative, intelligent and flexible often adapting new technology for their benefit and lifestyle. As Ani Mikaere stated in her 2011 presentation on the subject "… had they been anything less, we would not be here".[695] During the past couple of centuries Māori have been introduced to vast amounts of non-Māori knowledge and although colonialism was thrust upon us we adapted to survive and now in Ōtaki, at least Māori culture thrives. Thus, the co-existent use of western science was considered beneficial in this case study.

Ani Mikaere[696] now a kaiako[697] at Te Wānanga o Raukawa in Ōtaki[698], reflected on her life experiences as part of her 2011 keynote lecture '*Kei tua o te pae: The challenges of Kaupapa Māori Research in the 21st century*'. When she was a young Māori academic, kaupapa Māori research was emerging as a legitimate methodology. Ani Mikaere pointed out that Māori methodologies can still be restrained or confined by Western academic principles.[699] She warned against kaupapa Māori research becoming constrained by former Pākehā dominated 'mainstream' research - "this can stifle the transformative potential of our work."[700] To restrict or reduce the kaupapa Māori research methodology to a set of checklist criteria was a real threat in her opinion. She

[694] Young, A., 2014, Ngā Uara Tangaroa mō Ngāti Rārua me Te Ātiawa mō te tai o Aorere: A Motueka mana moana perspective of the cultural values within the ecosystem services framework for the Tasman Bay.
[695] Mikaere, A., 2011, From kaupapa Māori research to researching kaupapa Māori: Making our contribution to Māori survival, p. 37.
[696] Iwi member: Ngāti Raukawa, Ngāti Porou is a seasoned Māori academic writer.
[697] Teacher.
[698] Local whare wānanga in Ōtaki. For more information refer to website (www.wananga.com).
[699] Mikaere,, 2011, p. 37.
[700] Ibid, p. 30.

strongly recommended to researchers that they be mindful that research findings are readable and easily accessible to the participants. However she was still inspired by the radical theoretical changes, and fluid creative space within which kaupapa Māori sits. She concluded by stating that:

> Whether we are conducting Kaupapa Māori Research or re-searching kaupapa, I believe that our principal concern should be to play our part in the struggle for Māori survival… It is our task, then, to break free from our present trajectory, realigning ourselves with the foundational principles that our ancestors formulated as an expression of a conception of reality that enabled them to journey across the Pacific, to adapt to a radically different environment and to thrive. If we commit ourselves to reclaiming and reinvigorating that philosophical framework, we will be making our contribution to our long-term survival.[701]

In 2011, Linda Smith also presented at the same conference. She spoke about the transformative component of kaupapa Māori research that had inspired other indigenous researchers from around the world in a growing number of academic domains.[702] She reinforced the message that this methodology allowed for a certain freedom for the researcher, to emanicipate and liberate their imagination. In her opinion, this was the ultimate power of kaupapa Māori research. In a statement that is directly relevant to the Lake Waiorongomai case study Linda Smith commented on the use of Māori and Pākehā research methods, as positive.

[701] Mikaere, 2011, p. 37.
[702] Smith, L., 2011, Story-ing the development of kaupapa Māori – A review of sorts, p. 13.

> I think some people have been really successful… because they're able to draw on both kaupapa Māori and other methods and are able to draw those together to create an exciting proposal or because they've been able to show how kaupapa Māori will develop a richer way of gathering data with Māori.[703]

Wally Penetito discussed 'kaupapa academic research', 'kaupapa iwi research' and 'kaupapa marae research' which including researching at whānau and hapū level.[704] Āneta Rāwiri, outlined 'iwi-based partnership projects' also referred to as 'iwi-based kaupapa Māori collaborative research projects' that she was involved in.[705] These projects provided models for well-being at individual, collective iwi and community levels. The discussions within this hui showed the ever-expanding kaupapa Māori research paradigm with a continuing robustness to legitimise the methodology within western academic fields.

In 2012, Te Wānanga o Raukawa released a publication on *Restoring mātauranga to restore ecosystems*, written by Āneta Rāwiri. The author addressed the decline of ecosystems as absolutely linked to the loss of mātauranga and culture. The book addressed complexities and sometimes difficulties involved in collaborative projects that cross Māori and Pākehā research paradigms. She promoted that "… ecosystems restoration theory and practice need to shift away from 'participatory' approaches where we (Māori) participate in Pākehā-defined processes and frameworks – and move instead towards pluralistic processes."[706] Āneta Rāwiri explained that, although western science has certain limitations, it was an accurate method used to measure historic and

[703] Ibid.
[704] Penetito, W., 2011, Kaupapa Māori Education: Research as the exposed edge, p. 43.
[705] Rāwiri, Ā., 2011, Mouri Tū Mouri ora: My experiences of iwi-based kaupapa Māori collaborative research – an inherently transformative activity, pp. 16-18.
[706] Rāwiri, Ā, 2012, Te Wānanga o Raukawa: Restoring mātauranga to restore ecosystems, p. iii.

current biophysical states and declines in ecosystems. In her opinion Pākehā-based theory and methods could be utilised if they benefitted the wider needs and aspirations of the kaupapa-based framework.[707] Te Wānanga o Raukawa has a similar aim to the Lake Waiorongomai case study, to enhance and rehabilitate ecosystems, which includes the people in a whole of system approach.

> Efforts to restore mātauranga must support and strengthen iwi and hapū capacity to live it… Project activity must also closely consider the conditions that sustain iwi and hapū integrity and stability, and explore substantive, meaningful ways to strengthen them. Iwi and hapū carry a deep responsibility to protect and perpetuate mātauranga and whenua. Whakatupu mātauranga is broad in its scope and intent to support this, via activity to recover whenua and mātauranga; and iwi and hapū historical and via cultural rights to our natural and cultural resources. This activity is critical to restore respectful, reciprocal relationships with atua, tūpuna and whenua, and their life-sustaining roles. It is also crucial to establish mutually-respectful and mutually-beneficial relationships with outside communities. It enables iwi and hapū to gain a greater voice and control over decisions that impact on our whenua, and our lives…
>
> A kaupapa-based project seeks to create functioning mātauranga-based ecosystems in which hands-on experiential learning can take place. Theory and practice can be brought together to create an outdoor living classroom to achieve the

[707] Ibid, p. 11.

> multiple learning goals of preserving mātauranga, and restoring iwi, hapū and whenua.[708]

When Linda Smith's *Decolonizing Methodologies* was re-released as a second edition in 2012,[709] she refers to the use of kaupapa Māori research as a methodology used across disciplines including the fields of health, medicine, justice, education, history, law, politics, architecture, planning and environmental management.[710] She re-asserts the validity of Māori knowledge and historic practices in contemporary research contexts, including western paradigms, where these dual knowledge systems can be complementary, "Māori knowledge represents the body of knowledge which, in today's society, can be extended, alongside that of existing Western knowledge."[711]

In a 2015 collation of articles relating to kaupapa Māori theory and research,[712] Leonie Pihama described kaupapa Māori theory as: based on ancient knowledge; grown from mātauranga Māori and Māori movements; a relatively new theoretical framework with political intent; providing researchers with a cultural template.[713] She emphasised that kaupapa Māori theory is organic, fluid, evolving and transformative.[714] She also stated that: "to ensure the diversities of Māori experiences and an inclusion of whānau, hapū and iwi knowledge, Kaupapa Māori theory must be reflective".[715] This is directly relevant to this thesis, which is a reflective narrative of a hapū-led restoration project that achieved transformative change.

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[708] Ibid, pp. 22-23.
[709] Smith, L., 2012.
[710] Ibid, p 195.
[711] Smith, L., 1999, p. 175.
[712] Pihama, L., *et al.*, (Eds.) 2015, Kaupapa Rangahau: A Reader. A collection of readings from the Kaupapa Rangahau Workshop Series.
[713] Paper by Leonie Pihama, Kaupapa Māori theory: Transforming theory in Aotearoa. In Pihama, L., *et al.*,(Eds.) 2015, pp. 6-15.
[714] Ibid, p. 7.
[715] Ibid, p. 12.

Kaupapa Māori research is now widely accepted as an academic methodology expanding a wide variety of disciplines and fields.[716] Māori scholars are also extending beyond kaupapa Māori research methodologies contributing to modern academic research conducted in a Māori way.[717]

4.3 Historical emergence of action research methodology

Action research has been a recognised methodology for longer than kaupapa Māori research. The historical emergence of action research as a methodology is explored in this section.

Kurt Lewin was the first to introduce the term 'action research' in his 1946 paper *Action research on minority problem*' [718] which had a dramatic effect on social science at the time. As the originator of this concept in western academia he challenged the status quo when he famously stated that: "research which produces nothing but books will not suffice".[719] He argued that conventional research was not good enough for addressing complex social problems. "Unlike research that produces findings with action, the spiral and cyclical research process leads to action and improvement."[720] Action research methodology thus creates space for learning through experience and exploratory action.

Kurt Lewin proposed the theory of action research to be a process of action and reflection for a particular problem to bring about an effective social change. This notion addressed criticisms in social science where generalised trends were extracted from

[716] For example: Hollis-English, A., 2012, Māori social workers: experiences within social service organisations; Ngata, R., 2014, Understanding Matakite: A kaupapa Māori study on the impact of matakite/intuitive experiences on wellbeing; Pihama, L., *et al*., 2015; Smith, L., 2012, p. 195.
[717] For example: Ruwhiu, L., 1999, Te Puawaitanga o te ihi me te wehi: The politics of Maori social policy development; Hoani, S. & Davies, S. (Eds.), 2011, Toroa-te-Nukuroa: Volume VI: Whānau transformation through wānanga education.
[718] Lewin, K., 1946, Action research and minority problems.
[719] Ibid, p. 144.
[720] Craig, D., 2009, Action research essentials, p. 3.

survey data. He identified a series of steps often referred to as the 'cycle of action' (Figure 4.3.1). Kurt Lewin explained the process as "a spiral of steps each of which is composed of a circle of planning, action, and fact-finding about the result of the action."[721] He intended this mode of social research to not only understand social issues, but to effect positive change.

Figure 4.3.1 The action research cycle adapted from Lewin 1946 (*Source: Townsend, A., 2013, p. 12*)

The first step in the spiral of Lewin's 'cycle of action' was being aware of the problem. The mission to diagnose the issues meant that it was then possible to identify potential areas that 'unfreeze' a situation, create movement and therefore lead to transformative change.[722] Actions then follow with a fact-finding analysis of effectiveness. Adjustments are considered as the cycle completes. As the cycle continues the aim is to 'unfreeze' the complex issue and form new behaviours based on corrective action.[723]

Kurt Lewin identified the issue of who should participate in the research and how. He proposed that "at least of equal importance to the content of the research on intergroup relations is its proper placement within social life. When, where, and by whom should

[721] Lewin, 1946, Action research on minority problems, p.146.
[722] Chevalier, J., & Buckles, D., 2013, Participatory action research: Theory and methods for engaged inquiry, p. 11.
[723] Lewin, K., 1984, p. 206. Cited in Chevalier & Buckles, 2013, p. 11.

social research be done?"[724] He proposed that social research and change should no longer be "done 'to' or 'on' communities but activated by them, often with the support of others".[725] Lewin's work to enhance community performance was underpinned by a commitment to democracy, where the participants (including the researcher) were all fully engaged in all steps of the action cycle.

> Lewin adapted the logic of science and management to the task of collective self-inquiry and critical understanding undertaken by participants struggling with real-life issues. More than a method, action research is a commitment on the part of both researchers and actors to jointly observe, problematize and transform behaviour. Lewin's work is an inspiring meshing or scientific theory with real-life experimentation and the ideals of democracy.[726]

Alongside Lewin's theory similar initiatives emerged such as the 'sociotechnical analysis' that Tavistock Institute[727] (established 1947) developed within their action-oriented inquiry. Their contribution to action research included improving organisational settings. For example they assisted the British army when they faced various human resource problems such as low morale, officer selection and civil resettlement for repatriated prisoners or war."[728] During the post-war period their research extended into private industrial organisations who were struggling with complex issues along with scarce capital and low productivity.[729] This sociotechnical

[724] Lewin, 1946, p. 145; Lewin, K., 1946, p. 37. Cited in Townsend, A., 2013, Action research: The challenges of understanding and changing practice, p.11.
[725] Townsend, 2013, p.11.
[726] Chevalier & Buckles, 2013, p. 12.
[727] Ibid, p. 4.
[728] Dicks, H., 1970. Cited in Chevalier & Buckles, 2013, p. 13.
[729] Chevalier & Buckles, 2013, p. 13.

theory promoted a shift of emphasis from a top down approach, towards more internal supervision and cohesion between small self-regulating production teams. In this way collaborative action research looked at technical improvement and increasing multi-skilled employees, which resulted in 'joint optimisation' of production.[730]

The Tavistock Institute extended the principals of action research into analysing group dynamics by combining explorations into psyche and society. This experimental approach created the field of psychosociology, which then progressed into 'social clinical' practices.[731] Group psychology research aimed to support the personal growth of employees as well as creating institutional changes in the workplace, the educational system and in family life.[732]

In 1953, Stephen Corey conceptualised action research as a concept that was a natural fit in education where a practitioner-researcher is concerned about a particular issue of practice,[733] and can improve practitioners' practices.[734] The researchers were able to "define their problems more sharply, … draw on all of the experience available to them for action, … test out… promising procedures on the job and accumulate evidence of their effectiveness."[735] In his opinion "differences in methodology between traditional research and action research were minor."[736] He explained:

- Identifying the problem is similar to deriving a hypothesis.
- Planning action is similar to planning the methods and resources to collect data.
- Conducting the action is similar to gathering the data.
- Reflection on the results is similar to a discussion and/or conclusion.

[730] Ibid.
[731] Dubost, J., 1987, pp. 287-291. Cited in Chevalier & Buckles, 2013, p. 16.
[732] Chevalier & Buckles, 2013, p. 16.
[733] Corey, S., 1953. Cited in Klein, S. (Ed.), 2012, Action research methods: plain and simple, p. 15.
[734] Corey, S., 1953, Action research to improve school practices, p. 141.
[735] Ibid.
[736] Corey, p. 143.

In the 1970's, as action research developed in Latin America, Asia and Africa, the term 'Participatory Action Research' became popular in the southern hemisphere.[737] Participatory action research was well suited to the rural sector which is why it developed well in the southern hemisphere.[738]

In the 1960's, participatory action research was advanced by Paulo Freire who pioneered education research methods in adult literacy and learning environments. His contribution was based on the Marxist social theory. He championed a series of small meetings where collaborative decisions on a range of actions led to improved situations - promulgated by the participants.[739] Paulo Freire's critical pedagogy examined the use of 'grassroots' knowledge in reflection and action to transform the world. Similarly he emphasised community-based development to include participants as co-investigators.[740] Over the next four decades the application of participatory action research extended globally as a popular method in areas such as: "technological innovation (farming systems research, appropriate technology), alternative natural resource management (participatory rural appraisal, participatory learning and action) and the promotion of traditional, indigenous or local knowledge systems."[741]

Throughout the 1970's to 1990's there was a rapid growth in action research literature. The Lewinian cycle of action was adapted to guide practitioner-researchers further. In 1971, John Heron wrote about the positives of 'experiential research'.[742] He argued that

[737] Rimoldi, E., *et al.* (Ed's.), date unknown, Contemporary approaches to participatory action research in Aotearoa/New Zealand.
[738] Chevalier & Buckles, 2013, p. 21.
[739] Ibid, p. 23.
[740] Freire, P., 1993, Pedagogy of the oppressed, pp. 68-109.
[741] Chevalier, & Buckles, 2013, p. 21.
[742] Heron, J., 1971, Experience and method.

"the basic explanatory model for creative original research behaviour is… intelligent self-direction."[743]

In 1974, Chris Argyris and Donald Shön extended the 'action cycle' to 'double-loop learning' (Figure 4.3.2).[744] By 1978, the same authors extended the double-loop theory to 'organisational learning'.[745] They advanced action research theory to include the study of adult personality, high inquiry dialogue and actionable knowledge. Chris Argyris later reflected on their theoretical perspectives, which he stated had been inundated with criticism from professionals' defensive reasoning of their organisational routines.[746] Chris Argyris urged professionals within organisations to look inwardly and reflect critically on their own behaviour, in contrast to continuous problem solving of external environmental factors. He felt that double loop learning would contribute to widespread organisational system improvements.[747]

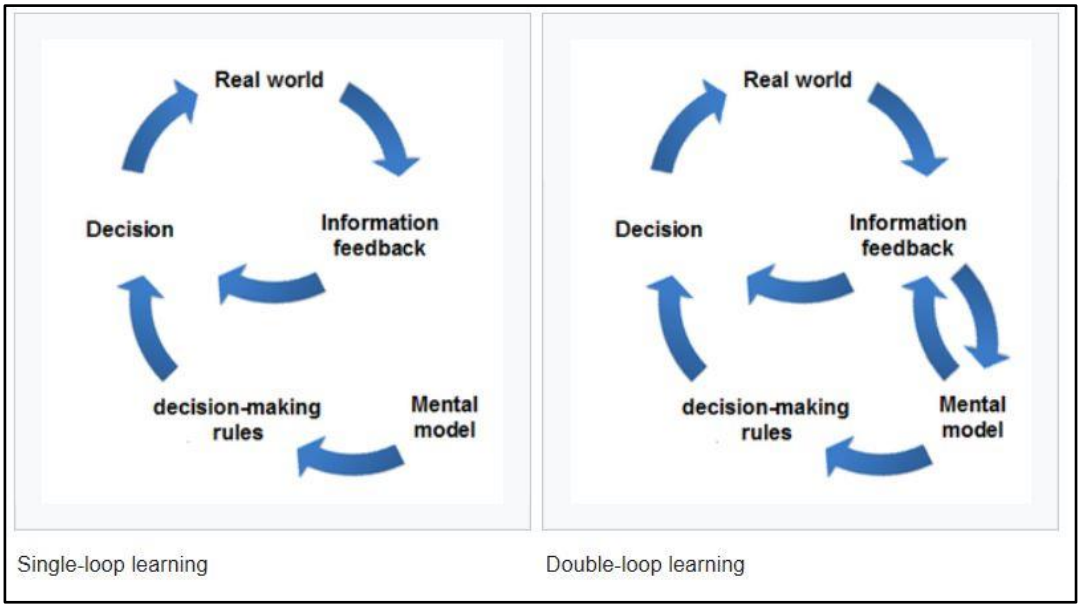

Figure 4.3.2 Double loop learning introduced by Chris Argyris and Donald Shön in 1974 (*Source: https://en.wikipedia.org/wiki/Double-loop-learning)*

[743] Heron, J., 1996, Co-operative inquiry: Research into the human condition, p. 3.
[744] Argyris, C., & Shön, D., 1974, Theory in practice: increasing professional effectiveness, p.19.
[745] Argyris, C., & Shön, D., 1978, Organization learning: A theory of action perspective, pp. 147-157.
[746] Argyris, C., 1991, Teaching smart people how to learn, p. 14.
[747] Ibid, p. 4.

In the 1980's, Stephin Kemmis and Robin McTaggart contributed to their field of education when they wrote a number of notable papers and books on action research. They expanded the Lewin cycle of action to include a separate step of observation between the action and reflection stages.[748] The purpose of this extra step in the action research cycle was to check on the consequences of the action.[749] They surmised that this observation period could also involve monitoring.

In 1982 Stephen Kemmis and Robin McTaggart introduced an extension of the action research cycle to include the double loop in an illustration (Figure 4.3.3).[750] They stated that the simple diagram has a complex array of tasks that contemplates the processes at each step. These two authors also discussed that four key steps may in fact be occurring at the same time. Thus they suggested the concept of 'moments' as more appropriate than 'steps'.[751]

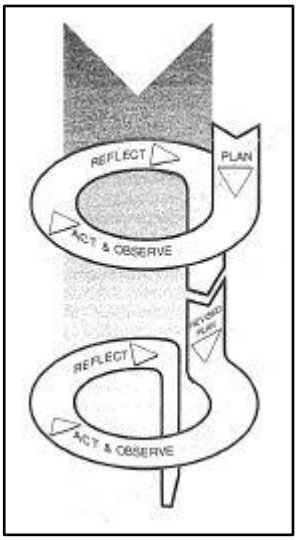

Figure 4.3.3 The double loop action research cycle introduced by Kemmis and McTaggart in 1982 (*Source: Kemmis, S., & McTaggart, R., 1988, p. 11*)

[748] Kemmis, S., & McTaggart, R., 1982. Cited in Townsend, 2013, p.12.
[749] Ibid, p. 11.
[750] Kemmis, S., & McTaggart, R., 1988, The action research planner, pp. 9-21.
[751] Kemmis, S., and McTaggart, R., 1982. Cited in Townsend, 2013, p. 60.

In 1985, Chris Argyris, Robert Putnam and Diana McLain Smith redesigned the action research field by extending the concept to introduce what they termed 'Action Science'. This was another collaborative research approach that advocated generating knowledge as useful in solving practical problems.[752] Action science is the study of "how human beings design and implement action in relation to one another."[753]

In 1988, Jean McNiff published a book on action research and its principles.[754] She expanded upon the 'living theory' concept by drawing on her own vast experiences as well as the experiences of others from around the world. Jean McNiff stated that action research put ideas into action, allowing the practitioner to adopt a relational stance to observe how different forms of knowing are integrated.[755] As the knowing then becomes a real-life practice; the theory is lived. Influenced by Noam Chomsky's[756] work about emergent, generative transformational nature of organic systems, she provided links to more recent literature on new science, complexity and systems theory.[757] Jean McNiff reflected that traditional models did not explain the 'hurly-burly' nature of her professional practice. She developed a model that depicted the generative transformational potential of her thinking and practice (Figure 4.3.4).

[752] Argyris, C., *et al.*, 1985, Action Science.
[753] Ibid, p. 1.
[754] McNiff, J., 1988, Action research: principles and practice.
[755] Ibid, p. 51.
[756] Known as making significant contributions to linguistics, cognitive phychology and contemporary politics as a "figure of enlightenment and inspiration" for political dissenters. Barsky, R., 1997, Noam Chomsky: A life of dissent, p. 191.
[757] McNiff, J., 2013, Action research: Principles and practice, p. 66.

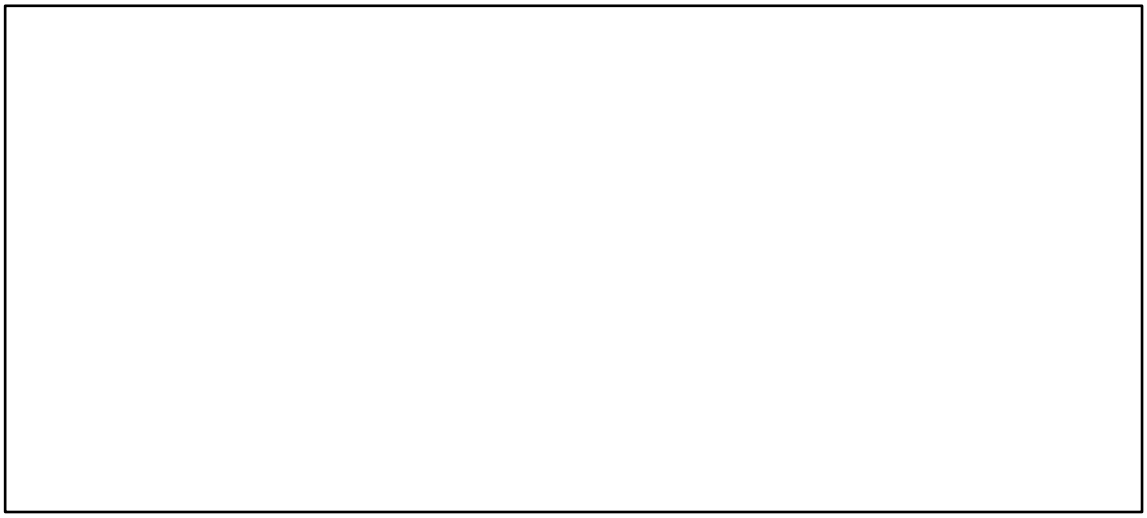

Figure 4.3.4 A generative transformational evolutionary process (*Source: McNiff, J., 2013, p. 66*)

Additionally, in 1989 Richard Winter, introduced six principles of action research that could be used as a guide for researchers: (i) reflexive critique; (ii) dialectical critique; (iii) collaborative resource; (iv) risk; (v) plural structure; and (vi) theory-practice transformation.[758] His principles highlighted the social aspects of action research. He argued that not only did action research aim to understand and improve practice it also set about changing individual and group relationships that might potentially modify entire settings.[759]

Orlando Fals-Borda along with his colleagues in Columbia conducted participatory action research around the same time as it was developing in western academia.[760, 761] He was a major contributor to the field of adult literacy, particularly with two key papers in 1985 and 1987.[762] While many of his early publications were written in Spanish, by the 1990s they were published in English and Spanish. This is when his

[758] Winter, R., 1989, Learning from experience: Principles and practice in action-research, pp. 38-68.
[759] Townsend, 2013, p. 33.
[760] Bergquist, C., 1990, In the name of history: A disciplinary critique of Orlando Fals Bordas historia doble de la costa; Gutiérrez, J., 2016, Participatory action research (PAR) and the Columbian peasent reserve zones: The legacy of Orlando Fals Borda.
[761] Fals-Borda, O., 1997, Participatory action research in Columbia: Some personal reflections.
[762] Fals-Borda, O., 1985 and 1987. Cited in McIntyre, A., 2008, Participatory action research, p. 1.

work influenced western academia. Orlando Fals-Borda commented that in his opinion the concept of participatory action research (Investigación acción participative) had spread to Europe and English-speaking countries from Latin America.[763] Orlando Fals-Borda had a far-reaching approach that combined community-based needs, knowledge and action learning into theoretical and inquiry plans of traditional science.[764] Orlando Fals-Boda distrusted academia and addressed the issue directly:

> Do not monopolise your knowledge nor impose arrogantly your techniques, but respect and combine your skills with the knowledge of the researched or grassroots communities, taking them as full partners and co-researchers. Do not trust elitist versions of history and science that respond to dominant interests, but be receptive to counter-narratives and try to recapture them. Do not depend solely on your culture to interpret facts, but recover local values, traits, beliefs and arts for action by and with the research organisations. Do not impose your own ponderous scientific style for communicating results, but diffuse and share what you have learned together with the people, in a manner that is wholly understandable and even literary and pleasant, for science should not be necessarily a mystery nor a monopoly of experts and intellectuals.[765]

In 1991, Orlando Fals-Borda along with his colleague Mohammad Rahman wrote a book that reflected on their participatory action-research field work, which empowered

[763] Fals-Borda, O., & Rahman, M., 1991, Action and knowledge: Breaking the monopoly with participatory action-research, p.10.
[764] Chevalier & Buckles, 2013, p. 27.
[765] Fals-Borda, O., 1995. Cited in Chevalier & Buckles, 2013, p. 27.

the oppressed over a twenty year period.[766] Their main aim (in conducting research in five continents during that time) and successes allow the people on the ground "to have sufficient control over the generation of new knowledge."[767]

In 1991 John Elliott created a revised action research model (Figure 4.3.5) that attempted to illustrate the complexity involved in this methodology.[768] While John Elliot continued to publish further material for the education sector,[769] he promoted the concept of teachers gaining a 'practical wisdom' as was his experience.[770] The Lewin cycle of action is layered in John Elliott's Model as a sequence of steps that portray the four main features of planning, acting, observing and reflecting. Like Lewin, John Elliott argued that conventional research was insufficient in untangling complex social situations.[771]

[766] Fals-Borda, & Rahman, 1991.
[767] Ibid, p. 146.
[768] Elliott, J., 1991. Cited in Townsend, 2013, p.16.
[769] Elliot, J., 1995, Elliot, J., 2007, Elliot, J., 2010. Cited in Townsend, 2013, p.130.
[770] Elliott, J., 1991. Cited in Townsend, 2013, p.17.
[771] Ibid, p.54.

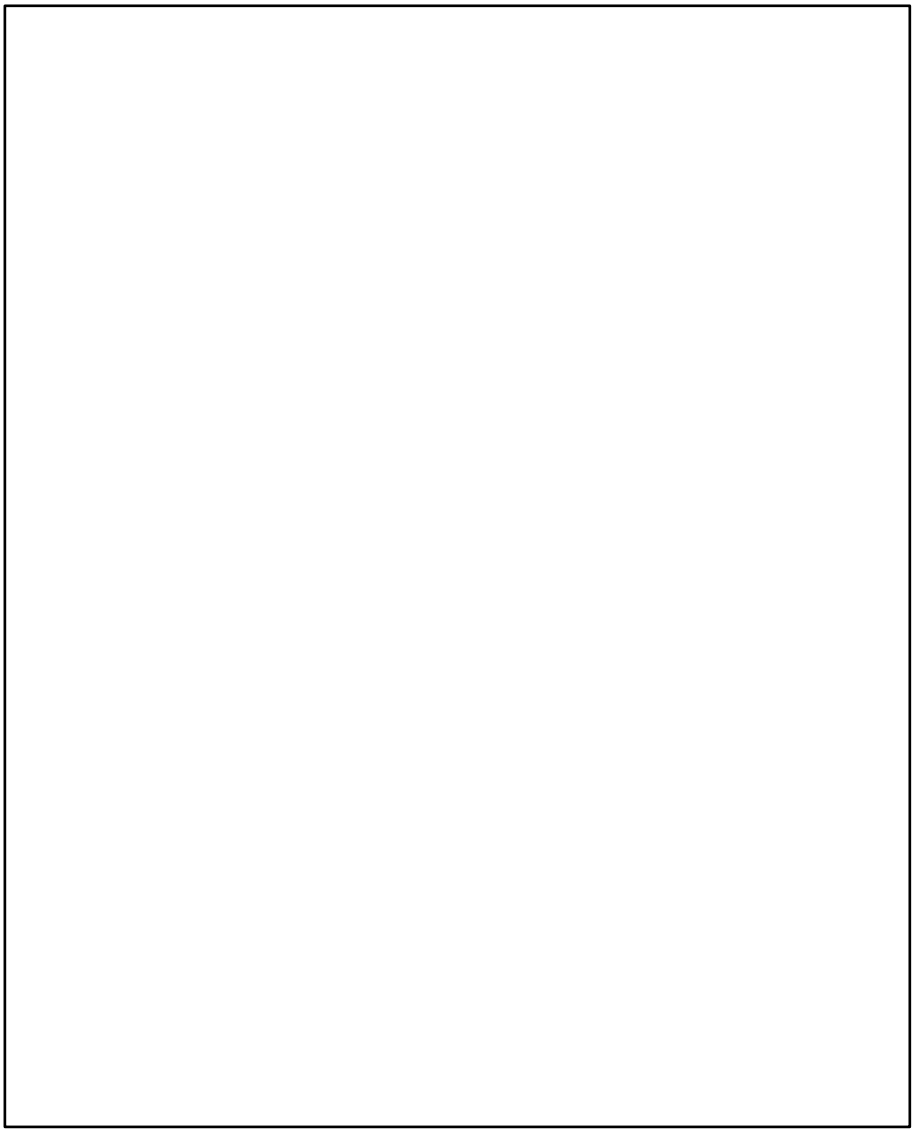

Figure 4.3.5 A revised model of the action research cycle adapted from Elliot 1991, p. 71 (*Source: Townsend, A., 2013, p. 16*)

In 1994, Sue Atkinson suggested that the action research cycle was too simplistic. She proposed mini-cycles and incomplete cycles of action to describe her point of complexity.[772] In the same year, Robin McTaggart published a paper suggesting that Lewin did not intend for his cycle of action by to be followed rigidly step by step, but

[772] Atkinson, S., 1994. Cited in Townsend, 2013, p. 25.

that it was pioneered to contravene normal research practice and allow for adjustments and interactions.[773]

> It is of course a mistake to think that slavishly following the 'action research spiral' constitutes 'doing action research'. Action research is not a 'method' or a 'procedure' but a series of commitments to observe and problematise through practice the principles for conducting social enquiry… The historical location of the spiral metaphor is important. In my view, Lewin was simply trying to suggest that action research was different from traditional empirical-analytic and interpretative research in both its dynamism and its continuity with an emergent practice. The spiral recognises the explicit possibility of acting differently as a result of progressively learning from experience.[774]

In 1998, Elliot Eisner introduced the concept of teacher-as-researcher, an experience that has its origin in the dealings one has within the teaching environment.[775] By examining qualitative inquiry he looked critically at the American education system.[776] Eisner considered knowledge not as an inert material that accumulates and is stored, but something that is known and therefore acted upon by someone.[777] He described growth in education and other social sciences as more horizontal than vertical. There is the

[773] McTaggart, R., 1994. Cited in Townsend, 2013, p.25.
[774] McTaggart, R., 1994, p. 315. Cited in Townsend, 2013, p.25.
[775] Eisner, E., 1998. Cited in Craig, 2009, p. 2.
[776] Eisner, E., 1998, The enlightened eye: Qualitative inquiry and the enhancement of educational practice.
[777] Ibid, p. 210.

opportunity to learn and examine situations from multiple perspectives, where such qualitative inquiry can accumulate in paradigm plurality across many fields.[778]

In 1999, Earnst Stringer launched four main characteristics of action research:

- It is democratic, enabling the participation of all people
- It is equitable, acknowledging people's true worth
- It is liberating, providing freedom from oppressive, debilitating conditions
- It is life enhancing, enabling the expression of people's full human potential[779]

During the late 1990's western natural scientists and anthropologists were acknowledging the contribution that poor rural communities could offer to knowledge development and improved lifestyles through participatory action research methods.[780] An expansive body of literature promoted the inclusion of 'indigenous, traditional or local knowledge systems' in action research. Important contributing authors to these concepts include D. Michael Warren, L. Jan Slikkerveer and David Brokensha,[781] and Fikret Berkes[782]. They wrote about the significant advantages to ecological projects by collaboratively using long accumulated (often generational and qualitative) local ecosystem knowledge of indigenous peoples to the often quantitative scientific approaches. Case studies incorporated traditional and local knowledge systems with western science approaches. These included "ethnogeography, ethnobiology, ethnobotany, ethnoforestry, ethnoagroecology and ethnomedicine".[783] From the case studies debates emerged at important international levels (e.g. the Convention on

[778] Ibid, pp. 210-211.
[779] Stringer, E., 1999, p. 10. Cited in Townsend, 2013, p. 30.
[780] Chevalier, & Buckles, 2013, p. 24.
[781] Warren, D., *et al.*, 1995, The cultural dimension of development: Indigenous knowledge systems.
[782] Berkes, F., 1999, Sacred ecology: Traditional ecological knowledge and resource management; Berkes, 2008, Sacred ecology.
[783] Chevalier, & Buckles, 2013, p. 24.

Biological Diversity, World Intellectual Property Organization and World Trade Organization) that addressed the question of whether traditional knowledge should be part of the public domain or be protected.[784]

The aforementioned John Heron (who introduced the term 'cooperative inquiry') expanded upon this concept when he wrote an article in 1997 and a later book chapter in 2001 with Peter Reason. Together they expanded the concept of action research with 'cooperative inquiry', which was based on promoting collaborative research *with* participants as co-researchers, rather than research *on* people.[785,786] These two authors introduced four ways of knowing – experiential, presentational, propositional and practical ways of knowing.[787] They recognised that forms of knowing also relied upon each other and were often grounded in 'experiential' and 'practical' knowing.[788] Using the action research cycle they identified four important phases.

- Phase 1 – co-researchers assemble to explore an area of social activity. They decide on a plan, the method of investigation and data they would like to collect.
- Phase 2 – the co-researchers then also become co-subjects with other participants and engage in the agreed actions.
- Phase 3 – the co-subjects all become fully involved and deeply engaged in the experience.
- Phase 4 – the co-researchers then meet again to share their results and raw data through presentations. They reflect on the original plans to develop, amend and perhaps repeat the process.[789]

[784] Ibid, p. 25.
[785] Heron, J., & Reason, P., 1997, A participatory inquiry paradigm, pp. 274-294.
[786] Heron, J., & Reason, P., 2001, The practice of co-operative inquiry – research with rather than on people, pp. 179-208.
[787] Heron, & Reason, 1997, p. 274.
[788] Heron, 1996, p. 204.
[789] Heron & Reason, 2001, p. 181.

By the turn of the 21st century action research had become a useful methodology that extended beyond cyclic illustrative traditions in tertiary education, community development, professional development, nursing, health and social care as well as others. As the history of action research was evolving the focus turned to participants involved in the decision-making. Mark Hadfield and Kaye Haw wrote a paper in 2001 that introduced the concept that action research could provide the opportunity to give people a voice through their involvement throughout the research process.[790]

In 2002, Bob Dick argued that the critical point of difference in action research is the continuous cyclic nature of an approach in which action leads to critical reflection, and often to action again, which in turn leads to a continuous evolution.[791] He illustrated his point in another extended action research model (Figure 4.3.6). Bob Dick provided a set of characteristics that defined action research and offered researchers a range of options.

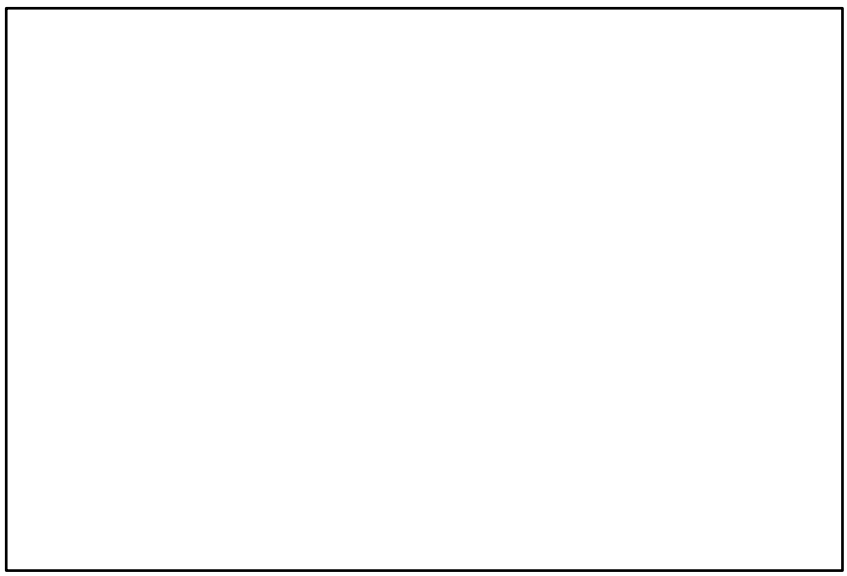

Figure 4.3.6 An extended action research model (*Source: Costello, P., 2003, p. 8*)

[790] Hadfield, M., & Haw, K., 2001. Cited in Townsend, 2013, p. 53. Later they published a book on the topic introducing video as data, video production as a process for generating data and the various video products available to be used at different stages of the research process: Haw, K., & Hadfield, M., 2011, Video in social science research functions and forms.
[791] Dick, B., 2002. Cited in Costello, P., 2003, Action research, p. 7.

Also in 2002 David Hopkins wrote a paper in which he strongly argued that too narrow a sets of steps or cycles might trap practitioners.[792] As pointed out by David Hopkins, the risk lay with practitioners who might become dependent on the model, reducing flexibility and inhibiting independent actions.

In 2003 Patrick Costello agreed with this contention in the field of action research.[793] He argued that "there is a close relationship between the collection of action research data and it's analysis."[794] As such he promoted the write up of results and use of appendices to display raw data.[795]

In 2005, Kathryn Herr and Gary Anderson were careful to note that action research is time consuming and sometimes messy.[796] For them however, it was a captivating research arena with further potential. They commented that more doctoral students were using this methodological approach. They encouraged them to publish their material on top of writing their dissertation, so that other practitioners could learn from them and extend the methodology.[797] Kathryn Herr and Gary Anderson's continuum of researcher positionality from the 'insider researcher' to the 'outsider' has been summarised in the table below by Andrew Townsend (Table 4.3.1).[798]

[792] Hopkins, D., 2002. Cited in Costello, 2003, p. 12.
[793] Costello, 2003, p. 12.
[794] Ibid, p. 57.
[795] Ibid, p. 71.
[796] Herr, K., & Anderson, G., 2005, The action research dissertation: A guide for students and faculty, p. 127.
[797] Ibid, p. 128.
[798] Herr, K., and Anderson, G., 2005. Cited in Townsend, 2013, pp. 78-79.

Table 4.3.1 Continuum and implications of positionality from the 'insider researcher' to the 'ousider'

Positionality of researcher	**Characterised by**	**Related traditions**
1 Insider researcher	Individuals studying their own practices and their own contexts. This can lead to improved self-knowledge and so can result in self/individual transformation	Practitioner research, autobiography, autoethnography, narrative research, self-study
2 Insider in collaboration with other insiders	Groups of individuals coming together to address common concerns. Depending on the ideals being promoted, this can vary in terms of its focus but would include collaborative inquiry groups intended to develop and improve practices within organisations.	Feminist consciousness raising groups, inquiry/study groups, teams
3 Insider(s) in collaboration with outsider(s)	Groups of individuals coming together to address common concerns with the support of an external agent. This could include the kinds of work where an external consultant, sometimes an academic, is employed to support organisational action research. The question here is which of these partners has most influence on initiating this action research. In this, the action researcher is a member of the team within the organisation or setting in which it is based.	Inquiry/study groups
4 Reciprocal collaboration (insder-outsider teams)	In this process partnerships are formed between action researchers, sometimes working in groups between different contexts, for example, different organisations. An example of this would include recent developments in networking action research and cases where groups from different organisations who have complementary but different interests work together with a common cause.	Collaborative forms of participatory action research that achieve equitable power relations
5 Outsider(s) in collaboration with insider(s)	In this process the outsider establishes a pattern of change, based upon action research, which they use in negotiation with and in support of a community. In this, the researcher is one of the outsiders who aims to achieve things with and on behalf of the insiders. This differs from (3), which the action researcher is one of the insiders who is receiving this support. This could also include some of the projects where action research is used as a means for developing practices.	Mainstream change agency: consultancies, industrial democracy, organisational learning, community empowerment (see Freire 1970).
6 Outsider(s) studies insider(s)	In this process the focus of study is the conduct and outcomes of action research. The purpose of the outsider is to understand the work and world of the insider and so they enter that person's, or group of people's, context, often organisation, or network, with the aim of understanding it. This is not necessarily covert, however, as the outsider would negotiate participation and involvement in this research as normal.	University-based academic research or action research projects.

(*Source: Adapted from Herr and Anderson, 2005, p. 31, cited in Townsend, A., 2013, pp. 78-79*)

In 2006, Jean McNiff and Jack Whitehead hypothesised a new idea of the 'living theory' model of action research that focussed more on the practitioner researcher involved and moved away from cyclic models.[799] They promoted a validation process which included video evidence to prove 'energy flowing values'.[800] This differentiated from propositional forms of research that are argued and written down. These authors also promoted the sharing of results as an important aspect of the learning process.[801]

In 2007 Danny Burns created a 'systemic action research' notion that again was an alternative to the original cyclic concept.[802] It was particularly suited to large organisational systems. Rather than small individual projects that followed a simple sequence of steps, this approach was aimed at the dynamic complexity within systems and dispersed activities. Danny Burns stated that "we can never fully understand, explain or predict reality, and we can only ever see a bit of it, but we can try to make enough sense of it to be able to act effectively within it."[803] Making sense of all the fragments through reflection is based on connecting the patterns and constructing a meaningful narrative derived from our emotions and our senses.[804] With regards to large, complex, systemic action-research projects, he commented that "a whole variety of methods are likely to be used… so mixed methods are likely to be a defining feature of systemic action research."[805]

Also in 2007 Bridget Somekh and Lesley Saunders introduced a new set of action research principles to guide practitioners. Their principles show an evolution of the

[799] Whitehead, J., & McNiff, J., 2006, Action research living theory.
[800] Ibid, pp. 64-79.
[801] Ibid. Cited in Townsend, 2013, p. 29.
[802] Burns, D., 2007, Systematic action research: a strategy for whole system change, p. 1.
[803] Ibid, p. 2.
[804] Ibid.
[805] Ibid, p. 133.

action research theory. The eight principles bulleted below outline what these authors consider action research should aspire to achieve:

- Integrates research and action
- Is conducted by a collaborative partnership of participants and researchers
- Involves the development of knowledge and understanding of a unique kind
- Starts from a vision of social transformation and aspirations for greater social justice for all
- Involves a high level of reflexivity
- Involves exploratory engagement with a wide range of existing knowledge
- Engenders powerful learning for participants
- Locates the inquiry in an understanding of broader historical, political and ideological contexts[806]

In 2008, Stephen Gordon adopted the term 'Collaborative Action Research' for transforming school cultures and empowering educators.[807] He championed collaboration as a powerful action research tool, where an external research expert might engage with small groups of teachers to conduct schoolwide projects. Stephen Gordon modified the action research cycle again for this concept (Figure 4.3.7). This is another example of an action research methodology being flexible to interpretation, social position and context.

[806] Somekh, B., & Saunders, L., 2007, Developing knowledge through intervention: Meaning and definition of 'quality' in research into change, p. 187.
[807] Gordon, S., 2008, Collaborative action research: Developing professional learning communities.

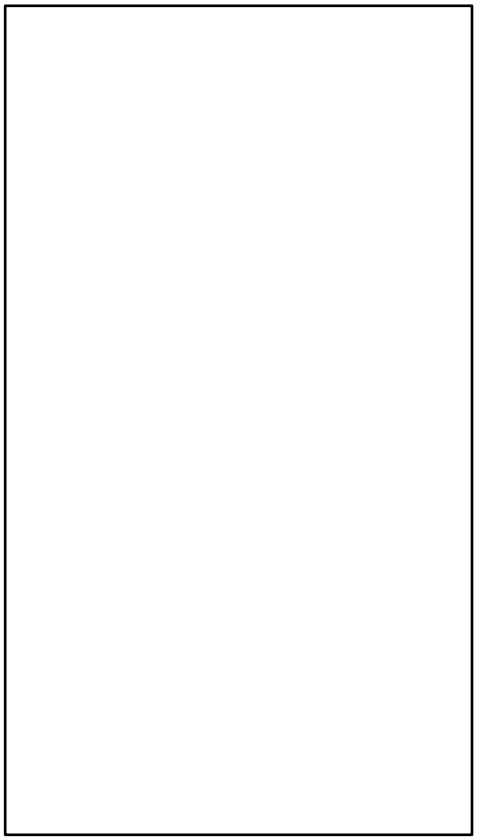

Figure 4.3.7 Schoolwide collaborative action research cycle by Gordon 2008 (*Source: Gordon, S., 2008, p. 3*)

In 2009, according to Dorothy Craig, action research differs to other types of research because of the addition of an 'action plan'.[808] This author stated that action research uses a qualitative approach to gather relevant data throughout the investigation.[809] This is in contrast to analysing the changes from starting and ending points. Three main options are utilised for qualitative data analysis, they are: (i) reporting; (ii) descriptive reality; and (iii) grounded theory.[810] The 'reporting' approach transcribes the results and through a low level examination presents observations of action and any reflections drawn for improvement in practice.[811] The 'descriptive reality' approach requires a greater level of engagement with a systematic way of gathering, transcribing and

[808] Craig, 2009, p. 12.
[809] Ibid, p. 165.
[810] Ibid, p. 166.
[811] Ibid

analysis of several sets of data.[812] Finally the integration of the data forms a narrative which is detailed in a final report.[813] Dorothy Craig promoted the use of 'grounded theory' as an intensive analytical approach, used to derive theory from the research environment, including interactions and activities that took place throughout the research endeavour.[814] The action researcher looks for "emerging categories, themes and patterns across the data sets, thus enabling findings that are grounded in research contexts."[815]

In 2009, Christopher Day and Andrew Townsend encouraged action researchers to write more during the process, as it assists the reflection stage.[816] They also saw writing as a means to promote and share knowledge between the action research community and its participants.[817]

In 2010, Martyn Denscombe stated that an action research strategy is to solve a particular problem and produce guidelines for best practice.[818] Martyn Denscombe provided very useful guidelines and best practice for social research including action research.[819] The cyclical action research process he recommended for professional self-development included five steps: (i) professional practice; (ii) critical reflection; (iii) research; (iv) strategic planning; and (v) action (Figure 4.3.8). Again this proposed action research feeds back directly into a continuous cycle to develop professional practice.

[812] At least three sets of data.
[813] Craig, 2009, p. 166.
[814] Ibid, p. 169.
[815] Ibid.
[816] Day, C., & Townsend, A., 2009. Cited in Townsend, 2013, p. 57.
[817] A number of journals emerged for people interested in using action research as an approach to their investigations, for example: Townsend, 2013, p. 57; Noffke, S., & Somekh, B., 2009, The sage handbook of educational action research, p. 3.
[818] Denscombe, M., 2010a, Ground rules for social research, p. 21.
[819] Denscombe, 2010a; Denscombe, M., 2010b, The good research guide for small-scale social research projects.

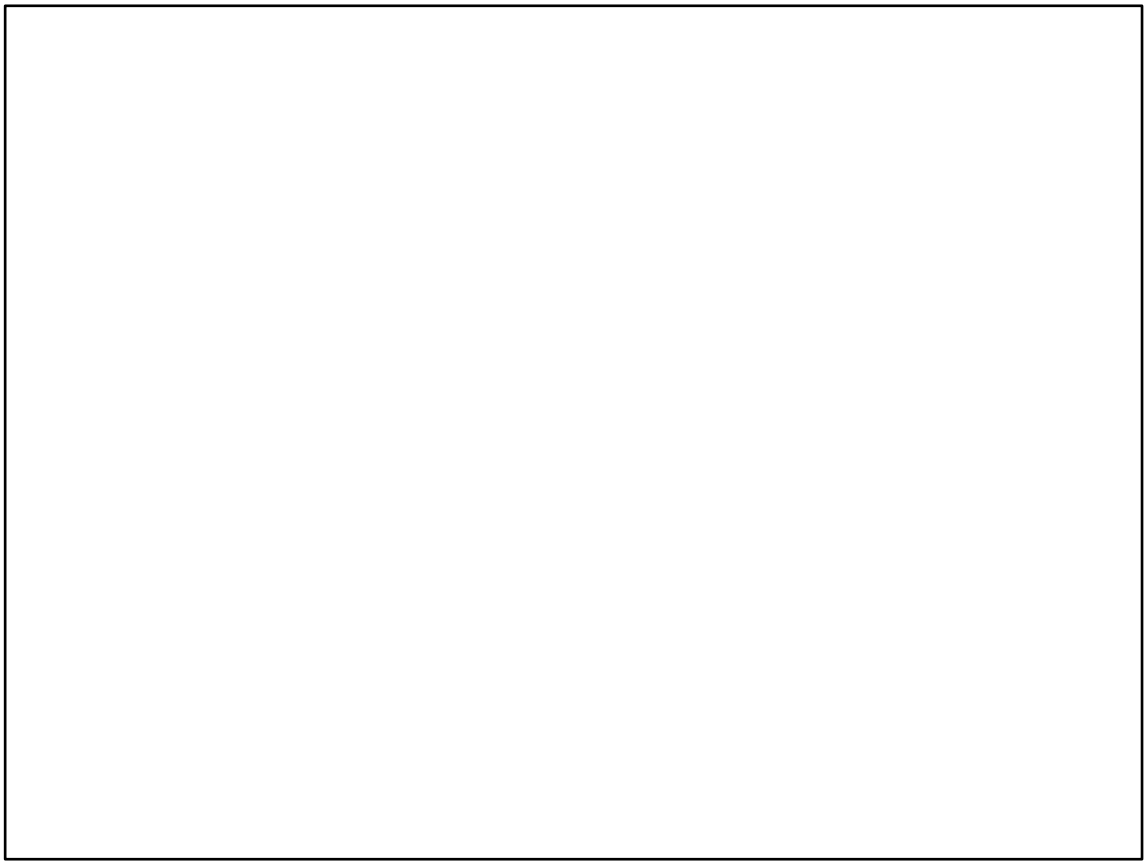

Figure 4.3.8 The cyclical action research process as extended by Denscombe 2010 (*Source: Denscombe, M., 2010b, p. 129*)

In 2010 Andrew Townsend extended the action research cycle to include six steps. It was aimed at upskilling academics at masters and doctorate levels.[820] This extended cycle of action research included: (i) refining a focus; (ii) conducting reconnaissance; (iii) reflecting on progress; (iv) planning for action; (v) implementing and observing action; (vi) reflecting and evaluating change.[821] He proposed that the steps could, in any situation, overlap each other, repeat a step, or remove a step, depending on the circumstances. This model was promoted as a guide to assist action research practitioners in the western academy, specifically for instructional purposes.

[820] Townsend, A., 2010, p. 141. Cited in Townsend, 2013, pp.18-19.
[821] Ibid, p. 19.

In 2012 drawing on the writings of Jean McNiff and Jack Whitehead (in particular their 'living theory'), William Barry presented his 'transpersonal living educational theory' as an alternative approach to action research.[822] Although he supported much of what Jean McNiff and Jack Whitehead promulgated, he strongly argued against their necessity of video evidence and values. His work in the educational field challenged the researcher to critique their own teaching practice. His aim was to transform the American public schools into holistic learning communities that understood and respected the multiple intelligences of themselves (the schools, teachers and researchers) as well as others, in order to improve their (students and teachers) health and well-being.[823]

In 2013, influenced by literature on principled views as the best approach to guide action research, Andrew Townsend created a new set of eight principles.[824] His principles are:

- Action research is concerned with changing and improving actions
- Action research involves, in some way, research
- Action research is located in professional, cultural and social contexts
- Action research is an inherently participatory process
- Action research is consciously and deliberately reflexive
- Action research is a self-critical and socially critical activity
- Action research is in itself educative
- Change through action research involves leadership.[825]

[822] Barry, W., 2012, Is modern American public education promoting a sane society? pp. 69-81.
[823] Ibid, p. 69.
[824] Townsend, 2013, pp.18-33.
[825] Ibid, pp.18-33-41.

In 2014, a group of researchers published an article that focussed on their approaches to action research with an integrated wildlife-management case study in New Zealand.[826] They suggested that the key to the success of integrated environmental and natural resource management depends on the participation of different disciplines and stakeholders.[827] Although they went on to highlight that in practice it can be difficult as "many initiatives fail to address the underlying social processes required for successful engagement and social learning."[828] The authors cited "an increasing number of science programs in natural resource management are being developed use collaborative or social learning approaches."[829] Will Allen and others used the action research approach to critically reflect on their research team engagement practice with Ngā Matapopore[830] with the purpose to identify lessons around how to collaborate more effectively. By doing so, they identified a need for conversations across a core spectrum of disciplinary, multi-, inter- and transdisciplinary research (Figure 4.3.9).[831] From their reflections, they created two rubrics for evaluating a research team's transdisciplinary and interdisciplinary collaborations. In their case they assisted their team with identifying issues early on in the project, which could then be mitigated. They stated:

> this provides us with a more reflexive approach to communication and engagement, grounded in an understanding of how our own work contributes to other disciplines,

[826] Allen, W., *et al.*, 2014, Bridging disciplines, knowledge systems and cultures in pest management, pp.429-440
[827] Ibid, p.429.
[828] Ibid.
[829] Tress, B., *et al.*, 2005, Researchers' experiences, positive and negative, in interactive landscape projects; Allen, *et al.*, 2011, Building collaboration and learning in integrated catchment management: the importance of social process and multiple engagement approaches; Robinson, P., *et al.*, 2012, Barriers and opportunities for integrating social science into natural resource management: lessons from national estuarine research reserves. Cited in Allen, *et al.*, 2014, p. 430.
[830] Ngā Matapopore ('The Watchful Ones') a national Māori advisory and advocacy group referred to in Allen, *et al.*, 2014, p.432.
[831] Allen, W., 2014, p.433.

knowledge systems and cultures. The lessons that emerge help us improve our own practice in this area.[832]

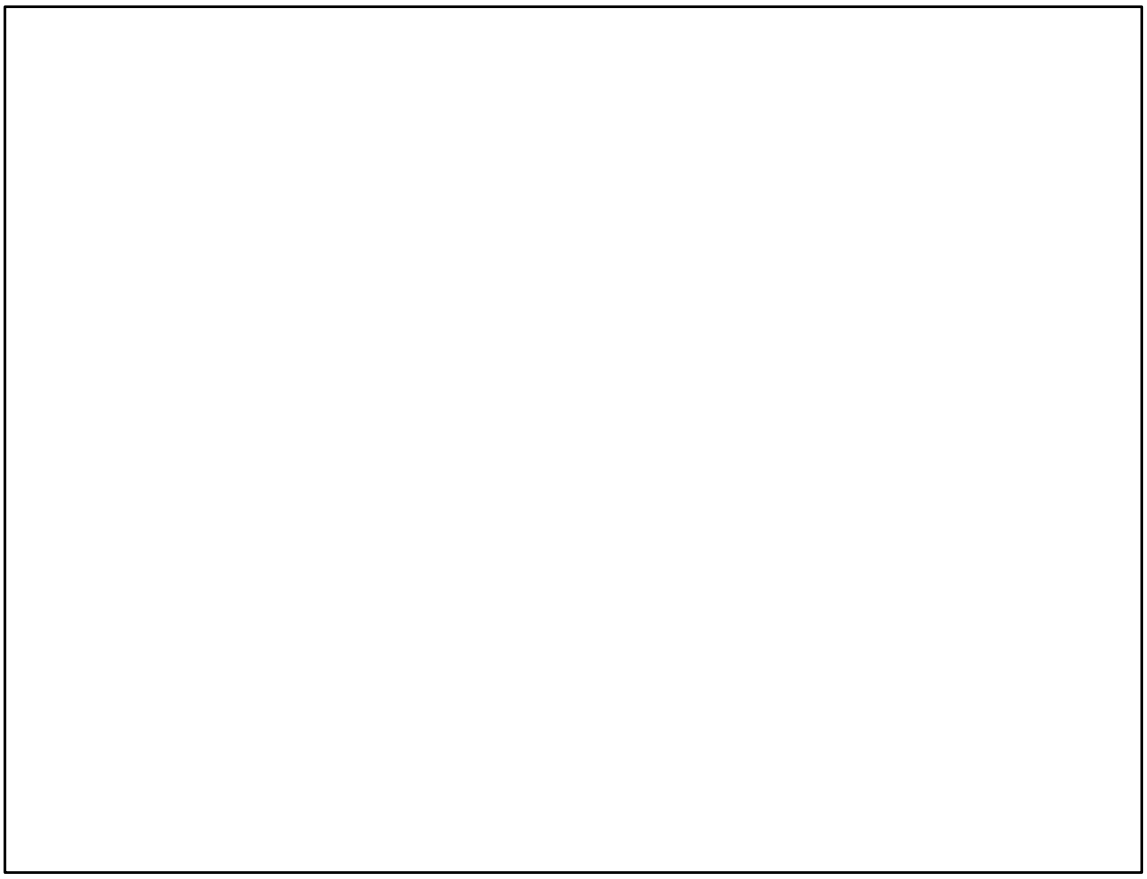

Figure 4.3.9 Different types of science driven initiatives and engagement likely to be required within an applied research program (*Source: Allen, W., et al., 2014, p. 433*)

4.4 Comparing and contrasting attributes of kaupapa Māori research and action research

Both kaupapa Māori research and action research were potentially useful methodologies to use and express in this doctoral research endeavour. There are many similarities and differences between kaupapa Māori research and action research, as explored in the preceding literature reviews. The table below analyses the literature reviews conducted to highlight a number of key attributes of the two research approaches kaupapa Māori

[832] Ibid, p.439.

research and action research methodologies (Table 4.4.1). This comparative analysis is an attempt to condense the contents detailed within Sub-sections 4.2 and 4.3. The table (4.4.1) was co-produced with whānau member Anthony Cole who has approximately 20 years contract research experience across a number of academic disciplines that support resource and environmental planning practice.[833]

Table 4.4.1: Selected key attributes of kaupapa Māori research and action research methodologies

Attributes	**Kaupapa Māori**	**Action research**	**The same?**
Worldview	Based on Māori philosophy	Based on western philosophy	No
Domains	Tikanga Māori	Business, education, family life, community	No
Applicable in social science field	Yes	Yes	Yes
Participatory action research	Yes as in 'Pedagogy of the oppressed'	Inspired by the work of Paulo Freire	Yes
Intelligent self-direction	Hapū mediated	Stakeholder mediated	Yes
Participatory involvement	Yes	Yes	Yes
Participants control the research process	Yes	Initially not a set process, now a semi-flexible guide	Yes
Participants control self-determined goals	Yes	Yes partial inclusion along with research & experts	Yes
Participants empowered	Yes	Yes this is the aspirations	Yes
Aligned with Critical theory	Yes based on reflection & practice (G.Smith, 1997, p41)	Yes (e.g. critical pedagogy (P. Freire, 1993))	Yes
Transformative change	Yes	Theoretically possible and desired	Yes
Orientation towards written outputs	Neither irrelevant nor central	Books alone will not suffice (K. Lewin, 1946, p. 35)	Yes
Acquire knowledge for the collective	Yes for the purpose & interest of whanau, hapū & iwi	Yes for the participants & potentially the community	Yes
Key mechanism of social change	Action and dialogue	Action and reflection	No
Applied and social methods differ	The expression of kaupapa relevant to both	Yes, methods differ in these 2 domains	No
Celebrates learning through experience	Yes (i.e. mohiotanga[834])	Yes (i.e. experiential learning)	Yes
Defining a problem	Not irrelevant, but manaakitanga is always first	First step in a cycle of action	No
Planning	Hapū-mediated	Community-mediated	No
Who does social research?	Knowledge development is always hapū mediated	Community-mediated and/or participatory	Yes
Researcher a participant	Yes, often whānau, hapū or iwi connections	Can be. Participants and researcher involved in all steps	No

[833] www.anthonycole.nz
[834] Knowledge, wisdom.

Forms of social organisation	Socially mediated and woven together by rangatira[835]	An attempt to create learning that is of the people, for and by the people	No
Researchers and participants work together	Yes. Modes of this kind are increasingly used	Yes. Community engagement and participation is central	Yes
Used as a trouble shooting method	Generally not	In organisations (e.g. low morale)	No
Efficiency oriented	Efficiency aspirations are provided by hapū as they deem appropriate	Can be, depending on the problem context	No
Action stage	Based on the expression of kaupapa and tikanga	The implementation of a plan	Yes
Observation stage	Yes	Yes and can include monitoring	Yes
Reflection stage is critical	Based on alignment to kaupapa and tikanga	Focused on plan completion and emerging best practice	No
Can involve concurrent action steps	Yes	Yes	Yes
Practical problem solving oriented	Value-based (e.g. reclaim, reframe, re-instate)	Yes (i.e. action science)	No
Reflexive critique	Generally not mana-enhancing	Yes, a search for superior explanation	No
Dialectical critique	Generally not mana-enhancing	Yes, an extension of action science	No
Theory-practice transformation	A dialogue between theory and practice always co-exist	Theory suggests that transformation is possible, work in progress	No
To improve practice rather than knowledge	Expression of kaupapa/tikanga is always central	Yes	No
Real-life experimentation	Yes. Research is a 'lived experience'	Yes. Experiential research (J.Heron, 1971), Living theory (J. Whitehead & J. McNiff, 2006)	Yes
Action research is not a method	Kaupapa and tikanga driven	A series of commitments	No
Is equitable	Every voice has a place	Yes - acknowledges people's truth worth	Yes
Is liberating	Decolonising activism	Freedom from oppressive, debilitating conditions	Yes
Is life enhancing and empowering	Yes	Yes	Yes
Driven by a vision for social transformation	Yes initial focus. But may include tangata and whenua	Yes	No
Political and decolonising motivations	Yes one strand of kaupapa Māori research specifically targets these foci	Can be used but generally it has a much wider scope	No
Rural poor community participation	Yes	Yes	Yes
Indigenous knowledge participation	Yes	Yes	Yes
Exclusive of other cultural knowledge	No (L. Smith, 2000; G. Smith, 2000 cited Denzin & Lincoln)	No	Yes
Science and community work together	Yes	Yes	Yes
Open to counter narratives	Yes	Yes	Yes

[835] Chief, high ranking leader.

Reclaims cultural identity	Yes	Yes	Yes
Reframes the subject–object model	Yes	Yes	Yes
Researcher is embedded	Yes	Yes	Yes
Citizen science	Yes	Yes	Yes
Integrates research and action	The development of kōrero Māori always exists insitu	Yes	No
Collaborative partnership	Generally hapū preferenced and led	Yes	No
Exploratory engagement	Can be but generally grounded	Yes	No
Reflexive	Can be	Yes	Yes
Co-learning	Yes	Yes	Yes
Contextually responsive	Yes	Yes	Yes
Creative rather than prescriptive	Yes	Yes	Yes
Sharing of results	Yes	Yes	Yes
Research data and intellectual property owned by participants	Yes usually	No usually the researcher or research team	No
Publishing determined by participants	Yes usually	No usually the researcher or research team	No
Spiritual, social and psychological aspects	Yes	Spiritual aspects not usually included but other 2 yes	No
Holistic	Yes	No	No

The results in this table show 34 attributes were similar between the two methodologies and 26 were not. So as discussed earlier in section 4.1 the two methodologies are somewhat aligned. However, significant differences also exist for example the two approaches are based on different worldviews. One option for this doctoral research endeavour would have been to use a combined kaupapa Māori research and action research methodology. However, methodological blending of this kind of concept would go against one of the founding principles of kaupapa Māori research (i.e. to emancipate Māori research from the constraints of Western ideologies). A kaupapa Māori research approach was clearly the most appropriate methodology for this case study.

However given the number of synergies and the relevance of action research to kaupapa Māori research attributes as clearly portrayed here, I retrospectively reflected on action research features of the case study (Chapter 6). This reflection and analysis provides an important Māori cultural contribution to action research scholarship based on a case study in which whānau and hapū determined their own research process.

Chapter 5 Key kaupapa expressed in the Lake Waiorongomai restoration project

Ki te whakatutuki ai ngā hiahia o ngā tūpuna,

kia ora ai ngā taonga o te iwi.

The desire of the ancestors to revive the gifts handed down to their descendents.

This whakatauki[836], in relation to this doctoral research endeavour, exhorts the aspiration of the whānau[837] and hapū[838] members of Lake Waiorongomai to restore and protect their wāhi tapu[839] as a special taonga[840]. Although the revitalisation process focussed on ceasing the ecological decline issues and then strengthening the wellbeing and mauri of the lake and its surrounding wetlands, the kaitiaki[841] team also envisaged active whānau engagement to return and use the site for cultural and recreational purposes.

As outlined in Chapter 4, this doctoral research endeavour utilised primarily a kaupapa Māori research methodology. The evidence presented in this chapter suggests that the Lake Waiorongomai restoration project provided numerous opportunities to express kaupapa[842], tikanga[843] and te reo[844]. Kaupapa are individual inherited cultural values

[836] Proverb.
[837] Family, extended family.
[838] Sub-tribe, clan.
[839] Sacred site.
[840] Treasure.
[841] Guardian, caretaker.
[842] Values, strategy, purpose.
[843] Custom, obligations.
[844] The Māori language.

that are also associated with certain types of behaviour. Our tūpuna considered some behaviours to be appropriate in certain places and at certain times (i.e. 'tika') and other behaviours were not appropriate. Kaupapa may then also be expressed as tikanga or the right ways of doing things. The expression of kaupapa, tikanga and te reo throughout the restoration project and this research endeavour were important to hapū and provide evidence of transformative changes to ecosystem wellbeing (which includes people)[845], enhanced cultural benefits and promoted growth in knowledge development. The whānau and hapū of Lake Waiorongomai were inspired by the local restoration project conducted by hapū of Ngāti Tukorehe at Te Hākari dune wetland in Kuku (Figure 1.2.2). The results of this doctoral thesis, supports the underlying argument presented by Huhana Smith in her doctoral thesis findings that by healing the whenua, the people are also healed.[846] All generations of Ngā Hapū o Ōtaki were able to contribute and be involved in the project. This will help to ensure positive impacts on the wellbeing of tangata, whenua and waterways continue into the future.

Figure 5.0.1 depicts an early timeline during the initial stages of whānau and hapū concern for their taonga and their aspirations for the restoration of Lake Waiorongomai.[847] Te Reo a Taiao Raukawa ki te Tonga (Taiao Raukawa) and the Manaaki Taha Moana (MTM) Horowhenua regional case study, provided iwi[848] support that led to Lake Waiorongomai becoming one of six local case studies in the region.[849] The Lake Waiorongomai case study was hapū-led and supported by myself as an iwi MTM researcher with ancestral links to the hapū of Ōtaki. I was approved by the hapū

[845] As discussed in detail in Chapter 2 (Section 2.1).
[846] Smith, S., 2007, p. 26.
[847] As discussed in detail in Chapter 3 (Section 3.2).
[848] Tribe.
[849] As discussed in Chapter 1 (Section 1.2). For more information about the Manaaki Taha Moana: Enhancing Coastal Ecosystems for Iwi and Hapū programme refer to www.mtm.ac.nz

to support them and the whānau of Waiorongomai. This in turn led to the doctoral research being incorporated alongside the lake restoration activities.

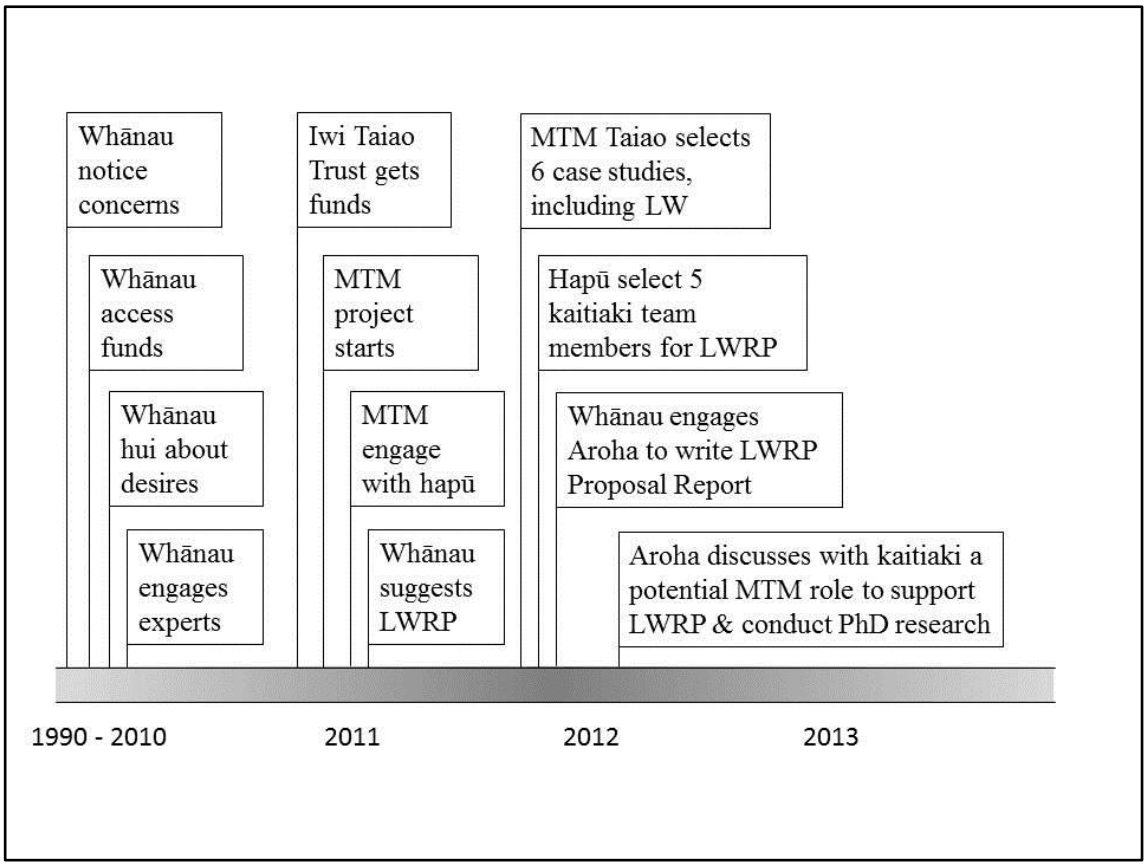

Figure 5.0.1 The Lake Waiorongomai restoration project initial timeline

Key: Lake Waiorongomai (LW), Taiao Raukawa the Iwi environmental research trust (Taiao), the Manaaki Taha Moana research programme (MTM), the Lake Waiorongomai restoration project (LWRP) and doctoral research endeavour (PhD research).

Figure 5.0.2 provides a basic overview of the Lake Waiorongomai restoration project and doctoral research timeline progressing from the ideas and the discussion stage to restoration activities. The oral narratives within this chapter are based on the experiences of whānau, hapū and myself, during the restoration project and doctoral research journey. These narratives emphasise the role played by the expression of kaupapa and tikanga in the restoration project. Therefore, this chapter is more than just a reflection on results or outcomes, in kaupapa Māori terms it also explains what might

be referred to in western science as 'method' (i.e. the expression of kaupapa and tikanga). In kaupapa-based Māori research, decisions on the appropriate use of method (i.e. the expression of kaupapa and tikanga) are generally not only made before a research project starts. The expression of kaupapa and tikanga are likely to be decided by whānau and hapū on a day-by-day basis during the project in response to real-world events, questions and problems that occur. As such, it is only possible to reflect on the methods used in a Māori community knowledge development journey in retrospect because of the flexibility within the research process. In addition, kaupapa Māori 'method' is socially mediated in real time and determined by the whānau, hapū and/or iwi. This chapter also enlarges on chapter 4 by providing a written reflection on both project outcomes and method.

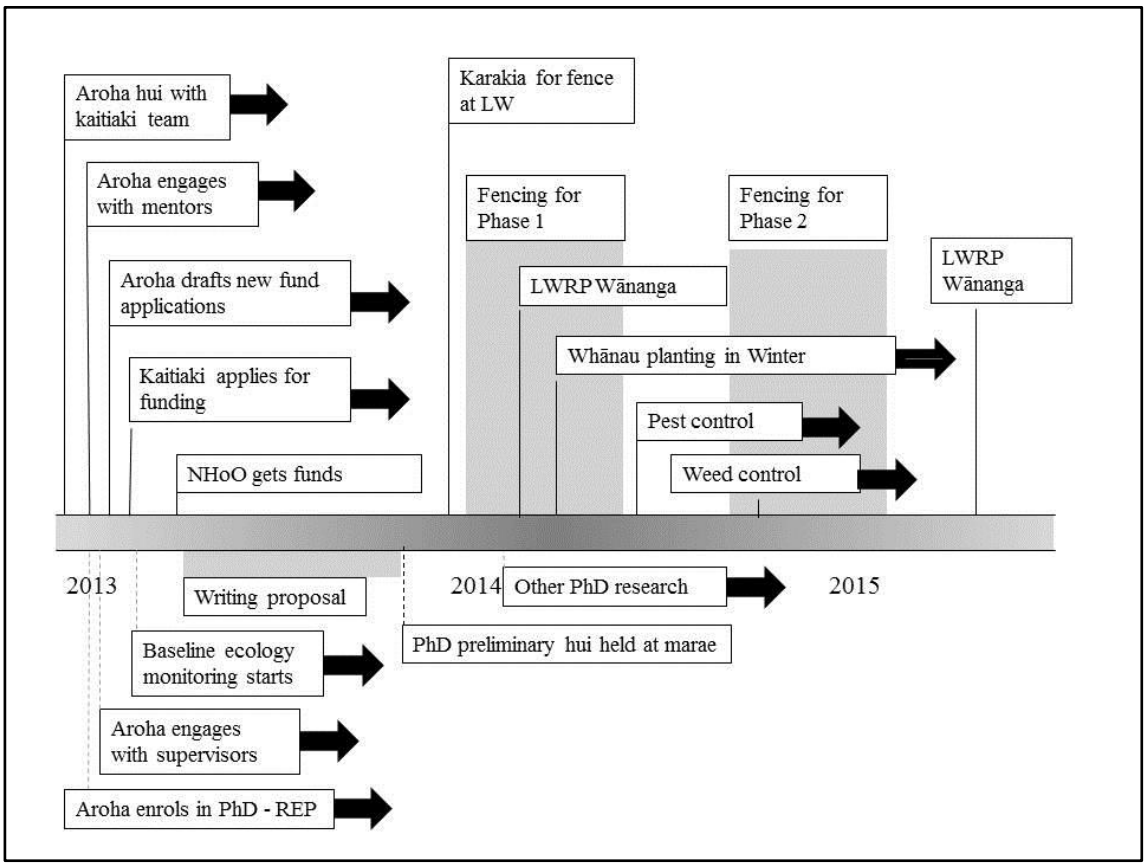

Figure 5.0.2 A timeline of the Lake Waiorongomai restoration project initial stages

5.1 An introduction to kaupapa of significance to this project

In this case study, kaupapa can be thought of as values that resonate with the things that key whānau and hapū of Lake Waiorongomai believe and know through their intergenerational experiences.[850] Huanga[851] is important, as Te Waari Carkeek explains: "Māori have a natural aptitude to lending their hands and minds to repairing special places in our whenua so we all share in this experience. We are the people who know our lands and seas from our tūpuna. Our whakapapa is in the lands." As a historic document for the whānau and hapū of Waiorongomai this chapter is expressed in narrative forms to describe, narrate and explain the restoration activities and experiences.

Numerous kaupapa are of value to the whānau, hapū and iwi who associate with Lake Waiorongomai. To provide context and understanding of their key kaupapa for the restoration project detailed throughout this chapter, brief explanations are provided below. Four kaupapa were considered highly important to local whānau at the start of this restoration project (i.e. rangatiratanga, wairuatanga, kaitiakitanga, ūkaipōtanga) and two more emerged as significant during the project (pūkengatanga and kotahitanga).

- Rangatiratanga – the right to conduct our affairs on the lands and waterways that we belong to by birth right, incorporating all aspects of our traditional and contemporary beliefs, in a chiefly manner. "Tangata whenua are the authority over lake environs."[852]
- Wairuatanga – spirituality, expressing respect for the environment that we're entering whether that be the ocean, forest or waterways. Wairuatanga includes the need to respect this sacred site at all times.

[850] T. Carkeek, personal communication, 7 November 2016.
[851] Benefit, advantage, relative, kin.
[852] Caleb Royal in Luke, 2014, p. 47.

- Kaitiakitanga – recognising our place in the natural world and includes activities like: fishing, hunting, planting crops, harvesting and storing food (at the right time of the year and month), maximising productivity and allowing the natural cycles of reproduction to sustain all life and natural resources. "Management of stock effluent; sowing of filter plants; [putting] land and water management policies in place; weed eradication; deletion of introduced species; fish stock rotation; increased native stocks; [implementing] commercial fishing bans; area recognised as mahinga kai[853]".[854]
- Ūkaipōtanga – an expression that describes our belonging to a place that: sustains us and that we in return respect and maintain. Utilised in mutually beneficial symbiosis. A place where we can engage in the traditions of our ancestors that are still beneficial in the modern world. "Papakāinga[855] and pā tuna[856] are re-established; and seasonal camping is a regular occurrence".[857]
- Pūkengatanga – teaching, learning and educating in a Māori way, passing on knowledge so that others become learned or proficient.
- Kotahitanga – the coming together of people and beliefs in a common kaupapa or tikanga for the benefit of all.

Oral interviews, wānanga[858], hīkoi[859] and visual footage were used to capture the expression of kaupapa, tikanga and transformative change. The theoretical and practical aspects of these methods used in the Lake Waiorongomai restoration project are described in Chapter 6. The remainder of this chapter is partitioned into three main result sections (5.2-5.4). They evidence the case study's expressions of kaupapa and tikanga used in this kaupapa Māori research approach. Section 5.2 is a synthesis of oral

[853] Cultivation, food gather place.
[854] Caleb Royal in Luke, 2014, p. 47.
[855] Original home, home base.
[856] Eel weirs.
[857] Caleb Royal in Luke, 2014, p. 47.
[858] Learning, workshop, seminar.
[859] Walk.

interviews gathered at the start of the Lake Waiorongomai restoration project that highlights the historic reflections of kaumātua[860]. Their words and individual interviews have not been reinterpreted, dissected or analysed - they remain as they were given. However, the individual interviews have been organised by myself (as author) to create themes for each kaupapa (5.2.1-5.2.7). General patterns within the whānau-hapū interview as a group at the start of the restoration project (5.2) have been analysed (in Sub-section 5.5.2).

Section 5.3 is a written narrative account that describes aspects of the Lake Waiorongomai restoration project as it evolved. The chronicle recounts the experiences of kaumātua, kaitiaki, whānau, hapū as well as the involvement of wider iwi and community members. My narrative reflections are then reinforced in Section 5.4 with the voices of kaumātua and kaitiaki gathered in oral interviews during and towards the end of my doctoral research endeavour. The whānau and hapū oral interviews in Section 5.4 have been treated similarly to those in Section 5.2 (i.e. organised into themes). The individual interviews have not been analysed but rather general patterns within the group have been reflected upon (Sub-section 5.5.2). The restoration narratives within this chapter are further supported with photographs as another form of evidence of transformative change underway. The final section of this chapter (5.5) will explore the transformative changes occurring during the Lake Waiorongomai restoration project. This, combined with the next chapter (6), will highlight the transformative changes occurring during restoration activities and until the end of this research endeavour. It is envisaged by the kaitiaki, whānau and hapū of Lake Waiorongomai that the restoration actions and learning opportunities will continue long after this research is completed.

[860] Elders.

5.2 A synthesis of historic reflections about Lake Waiorongomai from kaumātua at the start of the Lake Waiorongomai restoration project

The oral interviews of kaumātua and kaitiaki at the start of the Lake Waiorongomai restoration project expressed the strong link their whānau and hapū historically had with this wāhi tapu which was spiritually significant and a local food basket. The expression of kaupapa tuku iho[861] and tikanga maintained the wellbeing of Lake Waiorongomai. The local hapū were an integral part of this whānau Māori ecosystem.

5.2.1 Maintaining the wellbeing of Lake Waiorongomai through the expression of rangatiratanga - Te Waari Carkeek

Te Waari Carkeek highlights aspects of rangatiratanga, mana whenua[862] as well as kaitiakitanga in the following kōrero[863] when he introduced the Lake Waiorongomai site and restoration project at day one of the first MTM research programme hīkoi, held on 13 November 2010.

> Here it is (Lake Waiorongomai, once) covered in flax and toitoi, kanuka, manuka that's all been cleared, so you have got the remnant of the land. To me, when I was a child, a young person, this used to be a huge lake. I used to think it went on for ages. What I didn't understand was that there was another lake just to the north of it, which was called Kahuwera. So that lake had effectively been drained of all its water. So now its farm,

[861] Values passed down by our ancestors.
[862] Trusteeship of land.
[863] Narrative.

> the lake [Kahuwera], and the same thing was sort of happening here [Lake Waiorongomai].
>
> Our relations still own the land here but they farm it. As you can see the cows are in the lake, they're walking the edge of the lake and eating the edges of the lake. Also the two feeder lakes, one coming from the north and one coming from the south, also have cows doing their business in the water. So water quality in the lake has been seriously diminished over the last few years.[864]

5.2.2 Maintaining the wellbeing of Lake Waiorongomai through the expression of wairuatanga - Ariana Te Aomarere

The following kōrero is from a local tohunga who is in touch with that ever present spiritual dimension - Te Ao Tua-ātea. Ariana Te Aomarere recalls:

> My memories mainly come from my grandfather, Hema Hakaraia. He was a trainer and used to take his horses out there every day for walking and swimming in the sea. What I remember about Waiorongomai is what my cousins told me about the patupaiarehe[865] and how they hid in the sand dunes and how they came out when you caught the eels. I went out there a couple of times to catch the eels but unfortunately I didn't ever see any.
>
> A bit like a dream, a beautiful place, where the eels lived, an elementary place. A place that meant a lot to us, from our

[864] T. Carkeek, 13 November 2010, personal communication.
[865] Fairy folk.

> history, where battles were fought, where lines were drawn, where memories were made… A sacred place because of where it is placed because of its name… it holds a special place in many hearts and mine too. Grandfather, to him Waiorongomai was a place of sanctuary. He went there every day right into his eighties.
>
> As I still own a part of the lake bottom, it has a grip on me. It has a big grip on me and so that's maybe what I am sharing with you. That, although even you sometimes can not see that which connects you to a place, it still runs in your veins as does Waiorongomai run in mine.[866]

5.2.3 Maintaining the wellbeing of Lake Waiorongomai through the expression of kaitiakitanga - John Huff

Kaitiakitanga is inherently linked to rangatiratanga, since whakapapa links Māori to the natural world and results in a relationship that carries responsibilities to care and nurture. Kaumātua John Huff spent a lot of his youth at Lake Waiorongomai as many Ōtaki whānau, hapū and iwi members did back in the day. His interview was conducted with his two cousins the late Retitia (Betty) Raureti and the late Borgia Hakaraia who also had shares in the Waiorongomai 10 Block. These cousins requested their interview on the 9 May 2013 to be conducted together, evidence of their close relationship to each other as whānau. Throughout John Huff's kōrero, aspects of kaitiakitanga and whanaungatanga[867] were expressed.

[866] Interview with Ariana Te Aomarere, 17 December 2013, at Iti Street, Ōtaki, Interviewer Aroha Spinks.
[867] Kin ship, family relationships.

My name is John Huff. Born and bred in Ōtaki. Talking about Waiorongomai we were just saying a while back there, about the run of the eels. I used to go out there about the run of the eels. I used to go… with my father on a horse and cart early in the afternoon when it was a real storm, when it was really belting in. We used to go out about 3 o'clock in the afternoon. Set up camp out at the mouth of the lake down on the beach side and sit there and wait till dark. That's the only time they would come down was when it was dark. You could hear them coming down the drain, it was that full. Then you had to light the fire on both sides so you got the reflection of the eels going past. You just pick out the one's you wanted, you didn't just go in and throw any one out. You picked out the good sized ones.

The next morning you might have three to four, what they call chaff sacks in those days. Some people might know how big a chaff sack is… Then you'd go home about 10 in the morning. When you got back to Tainui [Marae] you just sang out to all the people that lived in that area and they came and got their part share of the eels. You know what I mean? You could come through the pā at any time of the week and all you would see, [were] not clothes on the lines, but eels on the washing lines. The clothes would be on the fence. All the tuna pāwhara[868].

[868] Hanging, filleting by splitting down the backbone, removing the internal organs, salting and drying in a traditional Māori process.

You know like, everybody looked after each other in those days there was none of this business of keeping a whole lot for yourself. And the little ones the cuz[869] was talking about, they were thrown in the eel box because they were too small to pāwhara or to waste salt on. So anybody that had a box were lucky, because they got what we called the left overs. But mostly everybody at Tainui always got their feed of eels. When the run was on even some of the Pākehā[870] up there used to like the odd eel or two - now and then. So you would send them half a dozen pāwhara eel. We supposed they ate them.

The thing in those days was the Māori, he got what he wanted and he shared. He didn't just catch them just because he had plenty. He didn't take it to the tip and throw it away. There was always somebody that wanted something. They never sold any of that sort of stuff. They never had much… you wouldn't call them millionaires. In those days, they just survived, week to week, but they never sold the kaimoana[871] not like they do now.[872]

[869] Abbreviation for cousin.
[870] Non-Māori, European.
[871] Food from the ocean and inland waterways.
[872] Interview with Retitia (Betty) Raureti, John Huff and Borgia Hakaraia, 9 May 2013, at Ngā Purapura, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.

5.2.4 Maintaining the wellbeing of Lake Waiorongomai through the expression of ūkaipōtanga - Borgia Hakaraia

The late kuia Borgia Hakaraia reflected on Lake Waiorongomai as a place of sustenance and recreation.[873] She visited the site a lot as a young lady and mentions some of the other whānau who were frequent visitors like herself:

> I would have been in my twenties out at Waiorongomai, when the water had dried up on the beach and the eels came from the creek and wriggled across the sand – hundreds of them! Johnny Bishop was out there at the time and he was filling up the bags. He had a spring creek and an eel box that he used to put the eels in – he was just picking them up! I couldn't get over the eels they just wriggled across the sand to the sea - a long way.
>
> I saw a toheroa heke. We used to go out to the lodge that Luke Webster built and camp there for a week. I remember all of us going out to the foreshore, just as it was getting on dark and the moon was up. We could see all these things coming up as we went along and they were toheroa. The waves would come in take them down and they'd dig into the sand again. I couldn't believe it! We were just picking them up! Toheroa – just like that.[874]

[873] Ibid.
[874] Ibid.

5.2.5 Maintaining the wellbeing of Lake Waiorongomai through the expression of pūkengatanga - Retitia (Betty) Raureti

For the kaupapa theme of pūkengatanga, the late kuia Retitia (Betty) Raureti provided a description of the special meaning that Lake Waiorongomai had to her as a young person growing up in Ōtaki.[875] Her expressions provide an insight into the 'on-the-ground' learning that playing and living off the land and waterways surrounding Lake Waiorongomai had on her and other local young teenagers. Included in her kōrero are aspects of pūkengatanga, whanaungatanga, rangatiratanga, as well as the condition of the wetlands as it existed at the start of the restoration project. This kuia had an important and influential role in promoting Māori education and te reo within the local Ōtaki region. She was Deputy Principal at Te Korowai Whakamana (the immersion te reo unit at Ōtaki Primary School) and then the first Principal for Te Kura-ā-Iwi o Whakatupuranga Rua Mano.

> No konei au, Ngāti Kapu me Maiotaki.[876]
>
> We used to go out [to Lake Waiorongomai] and these fullas [Borgia Hakaraia and John Huff] here would go out regularly and it was our world. We never or rarely came to town when we were very young, we'd be out there playing cowboys and Indians. We'd play games out in the sand dunes. There were heaps of lupin growing around the lake and heaps of flax so you couldn't get into it like you can now, just walk in, you had to fight your way through the flax that was already there. My disappointment in the place was the last time I went out 'it

[875] Ibid.
[876] I am from here [Ōtaki], of Ngāti Kapu and Ngāti Maiotaki heritage.

> looked like a lawn' the cows had eaten all the edges and you could get right into the lake. I thought they had really spoilt it.
>
> It used to be our playground. We were all Ngāti Kapu. That lake doesn't belong to Ngati Kapu but my grandfather owned the bottom edge of it. His family, Hakaraia's whānau, is Ngāti Maiotaki and so we thought because we were allowed out there to do anything we liked. It was, so we thought, Ngāti Kapu land. See we made it Ngāti Kapu playground. All the kids would go out there and camp. Aunties and uncles would send out food, potatoes, that we could cook on the fire. Stop ourselves from starving and you know we had to survive on our own, get pipis and whatever. Town meant nothing to us in those days, the place to be was out at Waiorongomai. That's where all the fun was for all the kids, we were 10-year-olds and older, anyone under [younger] wasn't allowed.[877]

The remainder of this sub-section (5.2) is dedicated to the kaupapa of kotahitanga and as such includes two interviews that are voices from an Ōtaki hapū member and a Pākehā to provide evidence of collaboration and contributions to Lake Waiorongomai from the wider community. Expressions and exercise of kotahitanga enhanced the success of the Lake Waiorongomai restoration project and doctoral research endeavour.

[877] Interview with Retitia (Betty) Raureti, John Huff and Borgia Hakaraia, 9 May 2013, at Ngā Purapura, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.

5.2.6 Maintaining the wellbeing of Lake Waiorongomai through the expression of kotahitanga - Hori (George) Grey

Hori (George) Grey, a well respected Ngā Hapū o Ōtaki member of Ngāti Kapu, worked for the regional drainage boards. He reminisced about how, historically, flood control mechanisms were considered very positive actions in the region, but are now considered detrimental to the ecosystem. George Grey presented at the MTM Landscape Architecture Wānanga for the Lake Waiorongomai case study.[878] His interview was conducted later at his home in Ōtaki on 19 August 2013, where he covered aspects of local lakes in the region including Lake Waiorongomai. The following is a short excerpt:

> I will tell a little story about Lake Waiorongomai. In the [19]40's, dad and the Henrys and the [other] families used to go out there March/April. We used to stay in a hutt. That's when the eels used to run when there was a big rainfall they would go out. We used to gather them on the beach. They used to go out in their millions. It's a sight, you never forget it. So it was up to us kids to help to gather them all. The grown ups hung them on the fence, got rid of the slime, pāwhara[879] them. All those eels were brought back to Tainui and shared out to our people. We used to supplement them with going to the beach and getting pipis they were opened and dried. When dad used to fish in his boat we got shark, it was dried. That's what we did as kids, gather, and we learnt alot.

[878] 14 March 2013 at Tukorehe Marae in Kuku.
[879] Hanging, filleting by splitting down the backbone, removing the internal organs, salting and drying in a traditional Māori process.

> Waiorongomai to me was one of our favourite lakes. It was a lake that mostly the town people went to but we used to go there as well. Tane and I used to always go there, spear eels, bring them home. I learnt a lesson from my father. We used to get out there in the mud. You try to kill an eel out there in the mud. It's pretty hard. I told him, he said: 'Son, what you do is bite their heads.' I said: 'What?' He said 'You bite their heads.' 'What if it grabs my tongue?' I said. [He replied] 'It wont.' I went out, crunch, oh gee it works. Well I also said to him: 'What about the slime?' He said 'You know that raupō you get that rub it in your hands, stick it in your mouth, chew it, all the slime sticks to it and you spit it out.' That is what we used to do, my cousin Tane and I. [880]

5.2.7 Maintaining the wellbeing of Lake Waiorongomai through the expression of kotahitanga - Tim Park

Greater Wellington Regional Council Biodiversity Coordinator, Tim Park,[881] was an enthusiastic mentor who had a vested interest to follow in his father's[882] footsteps and aid the restoration efforts underway in the Kāpiti-Horowhenua region. Tim Park was one of the advisors that had been approached by the whānau and hapū of Lake Waiorongomai to plan a restoration project in 1993. He could not be present at the first LWRP Wānanga in February 2014 so he agreed to be interviewed. A few relevant comments are provided next from his interview.

[880] Interview with Hori (George) Grey, 19 August 2013, Hadfield Street, Ōtaki. Interviewers Moira Poutama and Aroha Spinks.
[881] GWRC Biodiversity Officer at the time and now working for Wellington District Council in a similar role.
[882] Park, 1995.

I am a Biodiversity Coordinator at GWRC and have been working with hapū, Aroha, Huhana and Moira on dune projects for the last couple of years. My involvement with Waiorongomai stretches back to the time I worked with QEII Trust with the late Horiana Joyce who talked to me about the reservation[883] of the land and the process that started in early 2000. I have seen the lake degrade over the last 10-11 years, it is really sad to see those changes. So it's awesome to know or to see the fence is going up, when I was out there recently. It's an amazing achievement which I am very pleased is actually happening after talking about it for so many years.

So what is happening at the lake now. Obviously there is the fencing which is amazing. GWRC has supported that fencing through Iwi Projects Fund but we also have what we call KNE [Key Native Ecosystem] Programme. Because of its value Waiorongomai has been selected as one of our region's top lakes and wetland areas. It also has some coastal values, although it's degraded. We see that it is still pretty much intact, the lake system in terms of it's hydrology. We see the value in helping to restore it, so in terms of that KNE assisted programme we are developing, with Ngā Hapū o Ōtaki, Aroha and other stakeholders, a plan for the future restoration of the lake into the next 3 years. That will look at a written plan of the values and threats.

[883] Waiorongomai Block 10 is now registered as a reserve. Discussed in detail Chapter 3 (Section 3.1).

> Purchasing and maintaining traps for example. The planting potential of the lake, wetlands and sand dunes. A lot of things need to be taken into account and you need to get the right species for the right job. Restoration not enhancement. Restoring the local species the characters and the values of what it would have been. Taking it back not to a point in time but taking it to a point where it can function naturally. So hopefully we will end up with a state that will require little or no intervention or on-going maintenance. What plant species are appropriate to use locally but also you have to think about the whakapapa of the species. Because as you know harakeke can change a lot. If we bring in other varieties from elsewhere they will intermingle, interbreed with the flax and change that character. If we want to restore the natural values it is best to use the local varieties. Collect the seed from the local place or translocate from the existing plants around the lake. Spread them around the restoration to preserve that whakapapa.[884]

5.3 A narrative on the expression of kaupapa and tikanga during the Lake Waiorongomai restoration project

The following narrative recounts the experiences of whānau, hapū and the wider community involved in the Lake Waiorongomai restoration project as it evolved. My reflections begin at the start of my doctoral research endeavour and concentrate on the first few years of restorative actions. This chronicle selected aspects of the restoration

[884] Interview with Tim Park, 17 February 2014, at Greater Wellington Regional Council, Wellington, Interviewers Moira Poutama and Aroha Spinks.

project, as well as the expression of kaupapa and tikanga that contributed towards achieving hapū aspirations.

5.3.1 The expression of rangatiratanga as means of restoring a whānau Māori ecosystem - Aroha Spinks (reflecting on project initiation)

The Lake Waiorongomai restoration project became the topic of this doctoral thesis; in accordance with Māori tikanga – starting with the placement of a tono[885] on 24 November 2012. The tono was made by the author, in person, kanohi ki te kanohi[886] with the Lake Waiorongomai 10 Trust Chairperson (the late Jimmy Nicholls) and hapū members at Taaringaroa[887], Ōtaki. An important aspect of our tikanga is to be aware of reciprocity, that when asking for something, one should also offer a koha[888] in return. For example, the taonga I gifted to the hapū was two enlarged laminated aerial photographs of Lake Waiorongomai (Figure 1.3.1 and Figure 3.2.15). The permission I sought was their support for the proposed Lake Waiorongomai restoration project.[889] At the same time, my role in the MTM programme was to also conduct doctoral research. I left the proposition with the hapū members to discuss. A successful response soon followed, and with hapū endorsement, my doctoral research endeavour began.

Whānau and hapū members own the Waiorongomai Block 10 that includes the lake and stream as well as the surrounding lands.[890] Thus they always had the authority or rangatiratanga status in the Lake Waiorongomai restoration project. The hapū established a kaitiaki team including: Te Waari Carkeek, Rupene Waaka, Caleb Royal, Tanira (Rolly) Raureti and Libby Hakaraia. These kaitiaki were my main point of

[885] Special request.
[886] Face to face.
[887] The name of the office building alongside Raukawa Marae, 90 Mill Road, Ōtaki.
[888] Gift.
[889] The hapū of Ōtaki had proposed Lake Waiorongomai as a case study to the MTM Horowhenua team and Te Reo a Taiao Raukawa ki te Tonga (Taiao Raukawa).
[890] As discussed in detail Chapter 3 (Sub-section 3.1).

contact and each had individual authority to approve decisions for the restoration project. They also had the understanding of when to take an important decision to the hapū or a trustee for approval. One of the kaitiaki team members would report regularly to the Ngā Hapū o Ōtaki meetings on the restoration progress and seek endorsement for decisions that were best to receive from that level of authority. I would then report to the MTM Horowhenua regional team and Taiao Raukawa on the local hapū-led case study.

Initially, if a decision required Trust approval, then a kaitiaki would accompany me and introduce me to a Trustee and request endorsement, as an active example of kanohi ki te kanohi introductions to key decision makers. During those visits, whakapapa and whakawhanaunga[891] would be discussed and a koha (usually kai such as a packet of biscuits) was taken. Once a solid connection had been made with Trustees, I was advised by the kaitiaki to seek approvals myself. This communication process was crucial to the success of the Lake Waiorongomai restoration project as it upheld the mana of the hapū and whānau. An illustration showing the various levels of communication within this project is displayed and discussed in Chapter 6 (Sub-section 6.1.1).

The kaitiaki team had a range of expertise that was chosen by the hapū, with skills directly relevant to maintaining the rangatiratanga, tikanga, kaupapa, te reo, and restoration aspirations of hapū members. Kaumātua, Te Waari Carkeek is fluent in te reo Māori and holds vast knowledge of whakapapa and mātauranga. He sits on the GWRC[892] iwi advisory board, 'Ara Tahi'.[893] Kaumātua Rupene Waaka also has vast

[891] Getting to know each other.
[892] Greater Wellington Regional Council.
[893] www.gw.govt.nz/ara-tahi

knowledge of whakapapa and mātauranga and at present is a member on the KCDC[894] iwi advisory board 'Te Whakaminenga o Kāpiti'.[895] Both kaumātua provided valuable local knowledge and guidance. In their council positions they have well-established and positive relationships with both the regional and district councils. Notably, two whānau environmental scientists were chosen to be included in the kaitiaki team, Caleb Royal and Rolly Raureti.

Whānau and hapū valued the gathering of scientific measurements at Lake Waiorongomai and the involvement of these two kaitiaki provided hapū with the assurance that data gathering activities would be done in accordance with local tikanga. Both specialists also teach locally. This provided hapū assurance that as the local whānau appreciated the opportunities for furthering education this kaupapa would be included in the Lake Waiorongomai restoration project. Caleb Royal is a pūkenga[896] for environmental science in the Te Whare Oranga Kaitiakitanga Pūtaiao[897] at Te Wānanga o Raukawa[898] and Rolly Raureti a kaiako[899] of science at Te Kura-ā-Iwi o Whakatupuranga Rua Mano[900]. Both of these tikanga Māori learning institutions are located in Ōtaki.

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[894] Kāpiti Coast District Council.
[895] http://www.kapiticoast.govt.nz/Our-District/Tangata-Whenua/Te-Whakaminenga-o-Kapiti-Iwi-and-Council-Partnership-Committee/
[896] Lecturer.
[897] Department of Environmental Science.
[898] A contemporary Māori wānanga (equivalent to a university), delivering adult education in Ōtaki. "Established in 1981 as the first contemporary wānanga of Aotearoa, pioneering the application of kaupapa, tikanga, kawa to the advancement of Māori within a contemporary education context. Te Wānanga o Raukawa is a unique learning laboratory designed and built specifically for Māori. More than just educating our people, we wish to produce outstanding and sought after graduates who are Māori in the way they think, act and behave while also having the technical skills and qualifications they need to grow, inspire and uplift their whānau, hapū and iwi. Our pioneering education framework, founded on tikanga and kaupapa tuku iho, promotes opportunities to learn about how the Māori mind conceptualised and responded to the world prior to being influenced by the language and culture of later settlers. This distinctively Māori approach to tertiary education is often the key to an individual's academic success." Sourced from www.wananga.com
[899] Teacher.
[900] A Kura Kaupapa that has a vision of: "Providing a Kura-ā-Iwi whose language of instruction and play is Te Reo Māori whose operations are grounded in tikanga Māori, and who, together with the whānau,

Another whānau member involved in the restoration project was Libby Hakaraia, a local film director, whose work is considered (by local hapū) to be vital to the mātauranga wellbeing needs of this Māori community. The involvement of Libby Hakaraia meant that high quality visual records could be gathered during the restoration activities with whānau involvement in both filming and photographic documentation.

My very first task was to activate the restoration project and support the sourcing of the funds to fence off Lake Waiorongomai. This urgent intervention was needed, in order to stop cattle access to the lake and further prevent their direct faecal and urine contamination from affecting lake water quality. Along with guidance from Te Waari Carkeek, I drafted applications to the Ministry for the Environment and their Community Environment Fund. We also submitted a funding application to the GWRC Iwi Capacity Fund. As a recognised rangatira[901] and leader Te Waari Carkeek read, amended and then signed the applications on behalf of the hapū. Unfortunately, the Community Environment Fund application was unsuccessful. Our learnings to share is that in the conservation and research fields of New Zealand the funds are highly contested and competitive. We learnt to be prepared for knock backs at times, to persevere, not to give up, and to look for other avenues.

The Iwi Capacity Fund application was received positively and negotiations began with GWRC staff. Over a series of meetings (14 March, 16 April, 22 April, 8 May 2013) GWRC staff travelled from Wellington to Taaringaroa in Ōtaki to meet local hapū members and discuss the conditions of the application with hapū members. On the 21 May 2015 at Taaringaroa, Lee Rauhina-August (Pouhono ā Iwi – Te Hunga

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hapū and iwi of our tamariki will strive to ensure that we produce young people: who have excellent competence in Te Reo Māori and Mātauranga Māori, with a particular emphasis on Awa, Raukawa and Toa Rangatira tanga; who are high achievers and able to make choices about their future and; who are able to contribute to their whānau, hapū and iwi. E Kore au a ngaro, he kākano I ruia mai I Rangiatea. I will not be lost, for I am a seed sown from Rangiatea." Sourced from www.wrm.school.nz

[901] Of high rank.

Whiriwhiri[902]) of GWRC informed Te Waari Carkeek, Rupene Waaka, Caleb Royal and myself that the application had been successful. When the 'phase one' funding of $50,000 was approved for the first year of the restoration project, it was primarily targeted for erecting a batten and 8 wire fence around the lake. Council staff respected the rangatiratanga of the whānau and hapū, and were proactive in supporting the overall kaupapa of restoration. The whānau and hapū hosted and catered for the meetings as evidence of their expression of manaakitanga[903] and a positive working relationship was maintained with council staff and hapū throughout the Lake Waiorongomai restoration project.

Parallel with these developments, my doctoral research endeavour began. I formulated a research proposal for a Doctor of Philosophy (PhD) in Resource and Environmental Planning. My main supervisor, Murray Patterson[904] suggested that the PhD proposal and confirmation process be held at our marae. This suggestion was received well by the hapū. The Massey University Graduate Research School approved the request due to the nature of the project as immersed in kaupapa and this was the first Massey doctorate interview to be held off the Palmerston North campus - and even better on a marae. The hui was held on 1 August 2013 at the Taaringaroa office, Raukawa Marae in Ōtaki. Before my presentation, Murray Patterson informed the hapū members present that they had the authority to approve the PhD proposal first before I sat with the academic panel. The hapū felt comfortable with this process that acknowledged their mana and rangatiratanga as paramount. If they were not supportive of the PhD proposal then the research would not go ahead. Fortunately the proposal was widely supported and all questions were answered to the satisfaction of the whānau and hapū

[902] Job position title and in her role she liaised and looked after the interests of iwi.
[903] Hospitality, generosity.
[904] Professor at the School of People, Environment and Planning.

members present. Next, the academic panel from Massey University had questions that occurred in a private room within Taaringaroa. Once again, everything went smoothly. I then progressed from provisional to the next stage as a full-time doctorate student.

An important aspect of this hui to mention, was that when questioned by a kaumātua I guaranteed the intellectual property rights of the material gathered to remain with the hapū. Later at the first LWRP Wānanga[905] I discussed the necessity of writing the thesis authored by myself, and the hapū agreed. The hapū then also requested one journal article be produced which would summarise the thesis in a few pages and recommended publishing the article in a Māori or indigenous journal.

Another hapū preference was to involve whānau, hapū then iwi members first in all restoration activities at Lake Waiorongomai. Especially contract work as funding started to roll in, such as the fencing, pest control, weed control, harakeke splitting etc. The ability to offer paid work to their own whānau and hapū supported their ability to assert rangatiratanga and provide economic well-being to their own. One example, at the start of the restoration project was the first fence line that surrounded the lake within Waiorongomai Blocks 3B1, 3B2, 3B3 and 10.

As the deadline approached for the GWRC funding to be spent and the first milestone to erect the fence hadn't begun, I began to angst. To not spend and account for the Phase 1 money potentially jeopardised the proposed further funding of Phase 2, worth $50,000, which had been budgeted to continue fencing activities along the stream for the entire Waiorongomai 10 Block. Unfortunately two of the three hapū members who were experienced fencers had not been approached at that time by whānau members. The one approached whānau fencer turned up to the site visit late. Upon finding the gate

[905] 23-24 February 2014.

locked he drove away and this caused a delicate situation that resulted in a stand-off between two rangatira. I tentatively (but naively) suggested that the Pākehā company that had also separately provided quotes could do the job. However, this option proposal was adamantly dismissed by kaitiaki. Their explanation was that the hapū would not approve or be happy with that outcome. Respecting their guidance and with a few karakia, I continued to wait patiently.

After a discussion about the initial eel report results with Caleb Royal I discussed the fencing predicament we were in. He mentioned that a friend Jeremy Skipper (known as Skip) had only just asked him the day before about any fencing work in the area. Caleb Royal explained that Skip's whakapapa connections included Te Āti Awa ki Whakarongotai heritage, and importantly his daughter was a member of Ngāti Raukawa ki te Tonga and Ngāti Kikopiri. After a site visit a few days later and a quote within the week, Skip received the kaitiaki team approval. Whakapapa connections are extremely important to Māori and in this example it was the deciding factor in ensuring that hapū would approve. As the researcher, ensuring that the rangatiratanga of the whānau, hapū and kaitiaki was respected at all times contributed to the success of the restoration project as well as of my doctoral research.

To continue this fencing story, karakia was held on 21 December 2013 in accordance with our tikanga to ensure that the fencing work and fencers were spiritually protected and introduced to the tūpuna and kaitiaki of the lake (Figure 5.3.1). Rupene Waaka invited his nephew Tanira Cooper (a teacher at Whakatupuranga Rua Mano with proficiencies in te reo) to attend and assist the fencing activities. Most importantly, he was also there to manage a cultural aspect of concern to local hapū, the potential

excavation of koiwi[906] or other taonga[907]. This responsibility had a number of goals. First, to ensure that the physical objects would come under the protection of the whānau, and secondly to ensure the wairua[908] aspects of the taonga, activities and people involved were also protected.

Figure 5.3.1 Photographs taken at the karakia for the Lake Waiorongomai fencing to begin. Photo in the bottom right hand corner from left to right, Tanira Cooper, Rupene Waaka, Jeremy Skipper, Jay Skipper, Hans Somers, Huhana Smith, Ariana Te Aomarere, Te Waari Carkeek, Eila Paul and Aroha Spinks. *(Source: photographs taken by Moira Poutama 21 December 2013 in Smith, H, et al., 2014, p. 7)*

Tanira Cooper also happened to be the son-in-law of one of the whānau fencers that hadn't been reached and he invited Roy Winterburn to join the fencing team, a decision that was welcomed by Skip. That action again pleased the hapū greatly as two whānau members (Tanira and Roy) were working and being paid alongside the main fencing contractor. The full list of fencers in this Phase 1 are listed along with their iwi

[906] Human bones.
[907] Treasure, prized possession or object.
[908] Spirit, soul.

affiliations, in the table below (Table 5.3.1). The fencing was a significant restoration activity that supported the expression of rangatiratanga, whakapapa, whanaungatanga and ūkaipōtanga (Figure 5.3.2).

Table 5.3.1: The list Phase 1 fencers and their whakapapa connections

Jeremy (Skip) Skipper	Te Āti Awa, Ngāti Tama
Roy Winterburn	Ngāti Raukawa, Ngāti Kapu
Tanira Cooper	Ngāti Raukawa, Ngāti Kapu, Ngāti Pare, Tainui
Kiwa Raureti	Ngāti Raukawa, Ngāti Kapu, Ngāti Maiotaki, Ngāti Moewaka
Clarence Enoka	Ngāti Raukawa, Ngāti Maiotaki, Ngāti Kapu and Ngāti Moewaka
Pikitia Skipper	Ngāti Raukawa, Ngāti Kikopiri, Te Āti Awa, Ngāti Tama

Figure 5.3.2 Fencing in progress at Lake Waiorongomai (*Source: top left and bottom photos taken by Rupene Waaka 08 January 2014, top right photo taken by Aroha Spinks 31 March 2014*)

Earlier that first year when I was busy applying for funding, I had a notable conversation regarding the Lake Waiorongomai restoration project with one of the hapū

kuia, Nellie Carkeek. She advised me that the concept of protecting and restoring Lake Waiorongomai had been discussed many times in the past and that she had been to numerous hui with 'fancy food'. Her face and tone then suddenly changed as she looked at me solemnly and warned me "you had better not invite me to another hui to talk about restoration ideas until you have a post or a plant in the ground out there at Lake Waiorongomai."[909] I took that recommendation seriously and it was only after the fence was started on 6 January 2014 that, along with the kaitiaki team, we began planning the first LWRP Wānanga.

The annual wānanga were organised with Rupene Waaka as Chairperson on Ngā Hapū o Ōtaki who was able to determine dates that suited the hapū events calendar. Rupene Waaka also sent the invitations out via email (e.g. Figure 5.3.3) and encouraged hapū members to attend. The first LWRP Wānanga was held 22-23 February 2014 and was a very important event. It informed whānau and hapū members of the initial fencing activities underway, the future restoration plans for Phase 1, their potential involvement, funding, the doctoral research and asked again for future aspirations. The two day wānanga had a packed agenda of presenters, workshops, a hīkoi to the lake, monitoring demonstrations and delicious food (Appendix 2). The wānanga was funded by DoC Bioadvice Fund and administered by Taiao Raukawa. In accordance with the hapū, kaitiaki determined the program. This is an example of the iwi environmental trust respecting the rangatiratanga of the hapū.

Rupene Waaka ran the wānanga, introducing all the presenters and ensuring the program flowed. My supportive role began during the lead up to the wānanga and focused on the following kaupapa and tikanga: (i) tono - asking the presenters to be involved; (ii) kaitiakitanga ensuring presenters knew their presentation times and that

[909] N. Carkeek, personal communication, 12 March 2013.

new visitors understood the need to attend the pōwhiri[910] on the second day, (iii) kotahitanga – making contact with whānau via newspaper advertising, (v) manaakitanga - organising catering and koha for the presenters; and that (vii) ūkaipotanga – making sure all the resources were ready on the weekend for a successful wānanga.

[910] Welcome ceremony on the marae.

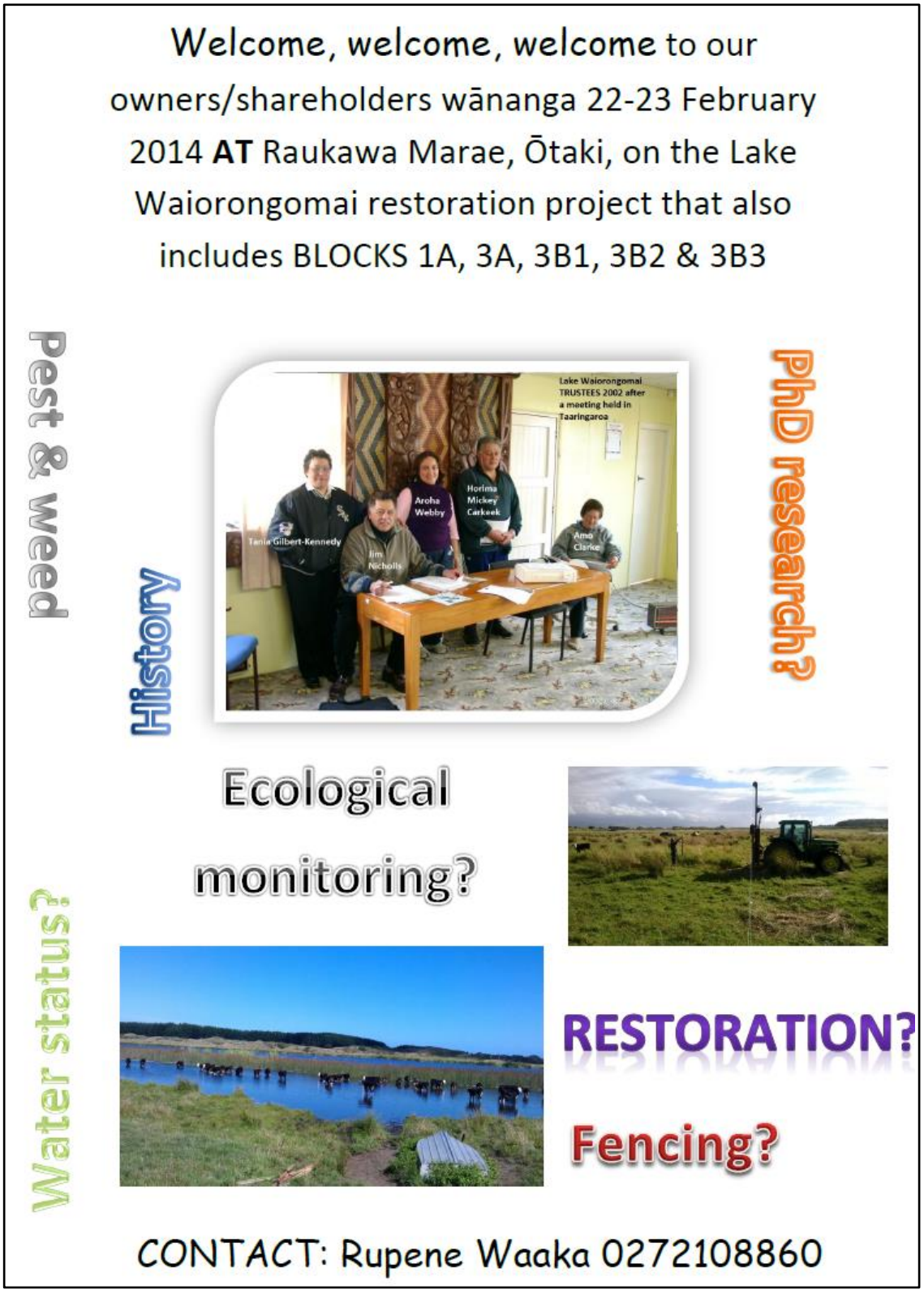

Figure 5.3.3 Lake Waiorongomai Restoration Project Wānanga 2014 invite *(Source: Rupene Waaka, 12 February 2014)*

The attendance at this first wānanga was very good. Over 50 people participated in the first day and 30 on the second. A majority of the whānau and hapū members were kaumātua although and range of ages were present (Figure 5.3.4). Only whānau and hapū owners were invited to the first day of the wānanga, this supported their status in the project and recognised their role in the expression of rangatiratanga. The leasees and community presenters were invited to the second day of the wānanga. One of two farmers at Waiorongomai came and contributed. The other sent in apologies as a family commitment took precedence, which was understood and supported by whānau. This wānanga provided the space for te reo, tikanga and mātauranga to be shared amongst whānau and hapū. It supported aspects of rangatiratanga and manaakitanga while encouraging whanaungatanga, ūkaipōtanga and kaitiakitanga.

Figure 5.3.4 Photographs taken at the Lake Waiorongomai Restoration Project Wānanga 2014 that show whānau and hapū involvement (*Source: taken by Aroha Spinks 22-23 February 2014*)

The whānau were supported by hands-on pūkenga experiences during a hīkoi to the lake. For example, they walked the whenua, saw the fencing activities, observed fish, eels and insect monitoring demonstrations, then finally spread seeds that had been collected on the site earlier. The first fence across the east side of the lake had just been completed earlier that day with the expression of manaakitanga. Another whānau member (Kiwa Raureti[911]) had been recently co-opted to assist with battening the new fence. On the day of the wānanga he started at 6am in order to finish the job just before the whānau arrived. The pole driving machine and wiring was occurring on the other side of the lake as Skip and Graham Winterburn were continuing the fencing job. Caleb Royal lifted the hīnaki[912] he had set the night before and, with help from Pātaka Moore[913] demonstrated eel monitoring and measuring techniques. The children participated in the handling of the eels, returning each to the lake after its measurements were taken. They also assisted with the ecosystem water sampling by scooping up fish, aquatic insects and water samples to be inspected and counted by the whānau, while I explained how these sample methods worked and presented recent results.

The proposed kākahi[914] monitoring was called off as Mickey Carkeek had a previous engagement planned at the Ōtaki Māori Racing Club that afternoon. As he had kaumātua and rangatira status, the whānau supported his excuse… with a bit of light-hearted laughter. Finally, the whānau were provided with purei, toitoi and upokotangata seeds that had been collected on the other side of the lake a few days earlier by myself

[911] Ngāti Raukawa ki te Tonga, Ngāti Kapu.
[912] Eel trap.
[913] Pātaka Moore is another iwi environmental scientist who supported the project and provided me with advice at the start of the project. He works alongside Caleb Royal at Te Wānanga o Raukawa Pūtaiao Department as a kaiako. As well as having Ngāti Raukawa ki te Tonga and Ngāti Pareraukawa[913] descent. He also had a whānau connection to the lake as his mother in law is an owner in the Waiorongomai 10 block. Therefore he felt a connection and responsibility to support the project for his children.
[914] Also known as freshwater mussel and *Echyridella menziesii*.

and Hayden Jacobs[915]. The active engagement of whānau in these activities is evidence of whanaungatanga, ūkaipōtanga, kaitiakitanga and rangatiratanga. The importance of whakapapa connections is also portrayed as whānau, hapū and iwi members contributed to the learning and knowledge development of the wānanga participants.

Libby Hakaraia filmed aspects of the wānanga and caught a special moment as the whānau looked at the Northern Drain and heard of plans for new culverts to improve fish migration. Kuia Hira Royal spoke, with emotion and tears, of being lucky to witness this day, to see the fencing, and the whānau involved (including her two daughters who were present by her side). She then sang a song to those tūpuna who had also desired this vision and had passed on to the heavenly realm.

5.3.2 The expression of wairuatanga events as means of restoring a whānau Māori ecosystem - Aroha Spinks

Given the nature of this wāhi tapu (sacred site), a spiritual dimension was ever present throughout the Lake Waiorongomai restoration project, especially whilst on site. Tikanga associated with wairua were very important to whānau and hapū. Tikanga required that karakia or whakarite[916] was performed at the beginning of all hui, wānanga and hīkoi to the lake.

> Whakarite – beginning the project with a proper ceremony to bless the mahi [work] and ask the natural guardians of the place to look after our project and all those involved in it.[917]

[915] Hayden Jacobs has Ngāti Raukawa ki te Tonga and Ngāti Wehiwehi whakapapa connections. He was at the time a recent graduate of the pūtaiao degree at Te Wānanga o Raukawa.
[916] Meaning blessing, or a karakia (prayer) could be expressed.
[917] T. Carkeek, personal communication, 7 November 2016.

The whānau and hapū established the tikanga that all new visitors to the restoration site be welcomed and introduced to the taonga, kaitiaki and tūpuna present at the lake with a karakia or whakarite first. Before any new work began at the lake, irrespective of what was being performed, karakia or whakarite was spoken to protect those conducting the job. This was usually conducted in Te Reo Māori.

> The karakia starts vibrational transference (i.e. as above so below). We draw on the higher power of stars. This is the magic that takes place. Linking sky and earth, Ranginui and Papatūānuku.[918]

The following narrative illustrates a time when karakia was no performed. As the fencing was nearing completion, gates remained open to the restoration area so that cattle had access to drink from the waters of Lake Waiorongomai. In summer, stock also used the lake as their bath. So an issue of importance for the restoration project involved providing water troughs for stock as a replacement for the lake water. An initial plan to remedy this problem involved providing the leasee of blocks 3B1, 3B2 and 3B3 with 'pumped' lake water for the three new paddocks created. To achieve this goal, three new troughs were ordered along with a water pump, solar panel, battery and pipes up to a new tank on a nearby rise. It was thought this arrangement, would provide a source of water directly from the lake and would thus allow the leasee to be independent. He could continue farming activities without stock access to the lake. This seemed like an ideal option.

The fencing contractor, Skip, had (with kaitiaki approval) sub-contracted a few extra helpers to assist with jobs such as battening. He was aware of the tikanga to provide a

[918] A. Te Aomarere and T. Carkeek, personal communication, 29 November 2017.

karakia for all new visitors to the lake. Skip was also responsible for ensuring the water troughs were operational as part of his fencing contract. To achieve this task, he engaged a sub-contractor to assist with the water trough installation. His friend, Bob[919] was Pākehā, a New Zealander who had expertise in setting up water pumps in the middle of the desert in Australia.

The first obstacle to the plan occurred as the pump that fed the water up to the water tank had insufficient power to operate in a way that provided the volume of water needed. This problem only became clear after Bob spoke to the engineer in the South Island who designed the pump. The local supplier reluctantly provided the engineer designer's details who informed us that:

> "no, that pump will only operate a gold fish pond."

Certainly not the volumes of water that we needed to supply to 25-30 thirsty cows… The pump was returned to the local supplier and a more expensive, submersible pump version was ordered from Australia. This model could float up and down within the water column.

The new water pump arrived, looking rather like a large silver bullet. However, on entering the lake, Bob discovered the large amount of aquatic weed and thick sediment on the western side of the lake. This was not ideal for the machine. Another day of discussions and new ideas saw the plan once again adjusted. In true kiwi ingenuity fashion, Bob rigged up a boogie board to float the pump in the higher surface level of the lake where the water was clearer. We were one step closer to solving the water trough dilemma.

[919] I have nicknamed him 'Bob' for the sake of recounting this narrative in a way that maintains his anonymity.

Next the solar panel became a sticky issue in this narrative. A solar panel was essential to power the pump, to bring the water up the hill, to be stored in the water tank which in turn could supply the troughs. However, with the system set up and the solar panel installed we discovered that it was insufficient to power the new pump. Extra solar panels were ordered, another delay.

Upon ordering these extra solar panels for the sub-contractor I began to ponder as I was finding the situation a bit 'out of the ordinary'. I then had an interesting conversation with Bob. I just had to enquire: "Did Skip provide a karakia for you, before you started working out at the lake?" "No" was the reply. As this revelation sank in… Bob continued to explain that he was starting to feel 'spooked' out there at the lake, wondering if the place was 'special' in some way, as the series of events to him also were 'unusual'. I explained the sacred aspect of the lake and its waters and although I organised a karakia for him soon after, it was too late. As he ventured out to the lake to attach new solar panels he discovered that the pump had been stolen.

New plans emerged and Rupene Waaka approached a neighbour to ask if we could tap into his water pipes to supply the leasee with water for his cattle. He agreed for an annual price based on likely volumes and the water issue was solved. Perhaps the water from this sacred site was never meant to be used for cattle to drink. Wairuatanga should be taken seriously in environmental restoration projects and always respected.

A common phrase used by Māori who are likely to take notice of signs or unusual events is 'now that's a tohu'. I personally had a couple of these 'tohu' during the restoration project. One in particular provides an example of a spiritual experience. It began with a discussion about my initial water quality monitoring results with one of my co-supervisors, Associate Professor Russell Death, and GWRC Science Department

staff member Alton Perrie. Alton advised that I should also include 'dissolved oxygen' and 'salinity' readings along with the other water quality parameters I was measuring.[920] He explained that the GWRC Science Department could loan the expensive piece of equipment to this community based monitoring. The dissolved oxygen and salinity meters arrived, already calibrated and ready to be used in the field via courier two days before the 1st of May 2013.

Now, to set the scene, the 1st of May is the opening day for duck shooting season - a significant occasion at Lake Waiorongomai for some whānau members. The dissolved oxygen meter needs to be in the water overnight, submerged for at least 24 hours, in the middle of the water column and free of aquatic plant material.[921] So I devised a plan to head out to the lake with all my water quality monitoring equipment, 15 lab pottles[922], temperature probe, secchi disc, pen, two laboratory sheets, my aquatic insect net, 5 insect collecting bottles and the two meters. I also had strong rope plus a knife. My good intentions were to tie the expensive dissolved oxygen meter to Rupene Waaka's maimai that stands out about 3 metres from the edge of the western side of Lake Waiorongomai.

After two hours I had completed all the other data collection so I was all set to fix the dissolved oxygen meter in place. Ideally it needed to be deployed on the same day as all the other water quality measurements were taken. This is when I discovered Rupene's maimai was surrounded in plant material, mostly raupō. Now if I had been a hunter, I would have known that the purpose of a maimai is to provide camouflage for the shooters. One of the key ingredients is to ensure that it is also set up early so that the maimai is not obvious or 'new' to wary and clever ducks. I had a laugh to myself as

[920] A. Perrie, 14 March 2013, personal communication.
[921] Not near the bottom of the lake or the surface.
[922] To collect the water samples for Total Phosphorus, Total Nitrogen, Chlorophyll a and Feacal bacteria.

I thought of those in my whānau and friends who are duck shooters who would have found my predicament humorous. It would have been so obvious to them.

As I was walking along the edge of the lake I considered the tight time frame I was in. I only had that afternoon to get the dissolved oxygen into the lake as in two day's time at dawn there were going to be a number of men out there with guns, shooting. I needed to deploy the meter that day and pick it up the next day. Otherwise I would lose the opportunity for an entire month (the duck shooting season).

So I asked the tūpuna and kaitiaki of the lake to help me as I walked along. I needed a pole in the middle of the barren looking lake that I could use to tie the meter to. I admit I was thinking my chances were slim. But then as I neared the north end I looked out the corner of my eye, and there it was: a pole sticking up out of the water, about 30 metres from the east side of the lake.

I was aware that I needed to take care within the north side of the lake. Hans Somers had warned me to take care, because it was treacherous and, in his words 'like quicksand'. I tried not to get my hopes up. I still had the dilemma of how to attach the meter to the pole, and was the pole even strong enough? As I waded tentatively out into the lake towards the pole, I was still requesting aid from those in Te Ao Tua-ātea to look after me and assist my quest. I honestly could not believe my blessed fortune. Not only was the pole made of strong steel and in an ideal spot, it had a strong wire wrapped around it in the perfect place for me to hang the meter off. There were no aquatic plants in the water either. Exhilarated from this wairua experience I thanked the kaitiaki and tūpuna.

As I tied the expensive meter very tightly to the pole I spied an elusive white heron. It stepped out from behind the rushes on the western edge of the lake where I had been

walking and first saw the pole. I had heard from the whānau that there was a white heron at Lake Waiorongomai but had not witnessed it yet. That was the tohu! A sign of wairuatanga. From my perspective it was also the spiritual guidance and approval from the tūpuna and kaitiaki of Lake Waiorongomai, that what I was doing was 'tika' - proof, that I had their support. This experience illustrated to me that Te Ao Tua-ātea and Te Aro-nui are intimately linked and interacting.

5.3.3 The expression of kaitiakitanga as means of restoring a whānau Māori ecosystem - Aroha Spinks

The restoration activities at Lake Waiorongomai are examples of the whānau and hapū carrying out their kaitiaki roles as they revitalise the site. The main restoration activities describing kaitiakitanga in this sub-section involves the completion of pest and weed control measures.

On 29 April 2014 the robust fencing around the lake was complete, with extra 'full rounds' and eight wires to aid in longevity and the exclusion of cattle. By 8 May 2014 a water supply had been provided for stock and the gates which secured access to the lake were closed. This was a momentous occasion for the whānau as their taonga was finally protected from direct cattle access and effluent. Whānau had also been excluded and locked out of entry to Waiorongomai Blocks 3B1, 3B2 and 3B3 by the leasee as he protected his cattle from theft. The strong fence and closed gates gave mana to the expression of rangatiratanga by local hapū. The whānau and hapū were very proud of this significant kaitiakitanga achievement and could now focus on further restoration activities. The lake, the mauri, the waters, the life within and surrounding the lake could all start to be enhanced.

Further evidence of kaitiakitanga (i.e. pest control measures) began immediately, as GWRC Pest Control Department staff member Gary Sue delivered twenty four 'DoC 200' predator traps. In accordance with the advice provided by Ngā Whenua Rāhui[923] staff member Rangimarkus Heke. The traps had been donated by GWRC (in October). Rangimarkus has whakapapa links to Ōtaki hapū and is an iwi member[924], locally trained and closely associated to the Te Hākari Wetland restoration project in Kuku (Figure 1.2.2). He provided advice on pest management. He also conducted the GPS locations of the proposed and actual fence lines that became a very important tool (discussed further in Chapter 6, Sub-sections 6.1.5 and 6.2.2).

Rangimarkus Heke placed the traps approximately fifty metres apart, numbered them accordingly with GPS locations. The traps were checked regularly and reset with eggs. Later meat was intermittently placed to provide variety. The volunteer trap checkers after an initial start by Rangimarkus were either trained by himself or the GWRC Pest Control Department. The GWRC Biodiversity Department provided direct funding support to Ngā Hapū o Ōtaki which assists with providing koha to these volunteers as well as other restoration activities. This financial assistance went towards associated trapping costs, such as eggs, meat, petrol, gloves and tongs.

The volunteers included Landross Lewis[925], Matthew Saywell[926] and then Graham Winterburn[927]. Once again, whakapapa connections were important. But not always, as in Matthew Saywell's case. He had studied pūtaiao[928] at Te Wānanga o Raukawa and had been taught by Caleb Royal. Matthew Saywell was also a family friend of mine. However, it was his connection and commitment to learning environmental science and

[923] A division of the Department of Conservation: Te Atawhai Papa (DoC).
[924] Iwi and hapū member: Ngāti Raukawa ki te Tonga, Ngāti Kapu, Ngāti Tukorehe and Ngapuhi.
[925] Iwi member: Ngāti Raukawa ki te Tonga, Ngāti Wehiwehi, Ngāti Tukorehe.
[926] Pākehā, Te Wānanga o Raukawa pūtaiao student.
[927] Whānau and hapū member: Ngāti Raukawa ki te Tonga, Ngāti Kapu.
[928] Meaning environmental science.

tikanga from our local whare kura that was important to the kaitiaki. The kaitiaki knew that he had good intentions and would respect our tikanga on site. Furthermore, he had learnt the associated theoretical pūtaiao knowledge and could now gain practical skills. This pūtaiao graduate, with keen enthusiasm and experience, progressed into employment at GWRC as a Pest & Plant Biosecurity Officer and then onto DoC as a Hut Warden on the Milford Track.

Landross Lewis had gained practical skills working with MTM case studies in Kuku, Ōhau River Loop and Kuku-Ōhau Estuary (Figure 1.2.2). He continued his knowledge development in this case study area by checking traps, splitting harakeke, digging holes for planting as well as planting and clearing the Waiorongomai Stream mouth of parsnip weed. Intermittently, depending on his other commitments Landross continues to assist in activities out at the lake. The photo below shows Landross receiving further advice and learning from KCDC Biodiversity Officer Rob Cross - an evidence of kaitiakitanga as well as pūkengatanga (Figure 5.3.5). Graham Winterburn as a whānau member has a vested interest in this project, which is perhaps why he continued to check the traps for the longest period. Graham Winterburn's commitment to checking all the traps each month throughout the year is an example of kaitiakitanga and ūkaipōtanga. These restoration activities, expressions of kaitiakitanga and ūkaipōtanga assist in improving the well-being and mauri of the Lake Waiorongomai ecosystem.

Figure 5.3.5 Photographs of pest control measures in 2014 at Lake Waiorongomai**.** Photos clockwise from the top left, GWRC vehicle that brought donated traps. *(Source: taken by Aroha Spinks, 20 March 2014)* The GPS locations of all 28 traps within the total restoration area. *(Source: map created on aerial photograph by Michael Urlich, 10 February 2015)* Landross Lewis (left) getting a demonstration and kōrero from Rob Cross (KCDC Biodiversity Officer). *(Source: taken by Aroha Spinks, 12 July 2014)* Baby ferret caught in trap #20. *(Source: taken by Aroha Spinks, 6 November 2014)*

The traps were an effective kaitiakitanga measure that continues in the restoration project. Ferrets, stoats, cats, rats, hedgehogs, and one unfortunate blackbird were caught. The full results are reported on and discussed in Chapter 6 (Sub-section 6.2.3).

Te Rito kura students on their hīkoi[929] to Lake Waiorongomai received demonstrations of the trap resetting with strong warnings from Landross Lewis to not place their hands within the traps, as they would be severed. The students also received a kōrero from their teacher and kaitiaki, Rolly Raureti about the damage rodents do to bird and skink populations in wetlands. The sharp little teeth on the dead baby ferret shown in Figure

[929] 7 November 2014.

5.3.5 helped convey this message to students. More learning opportunities arose for students during the restoration project and these are detailed in the narratives of pūkengatanga (Sub-section 5.3.5).

On the advice from Rupene Waaka I applied to KCDC Heritage Funding for weed control and was successful. KCDC Biodiversity Officer Rob Cross met with Rupene Waaka and I to create a weed control plan. We discussed the use of funds and preferred contractor. KCDC took into consideration the hapū request and contracted Dean Murray, an iwi member[930] recently returned from Australia with experience in this field. Rob Cross contacted the GWRC Biodiversity Coordinator (Tim Park) and they discussed the support and funding that GWRC were contributing to the Lake Waiorongomai restoration project. Rob Cross then approved further funding from his department to assist with native trees planned for planting in winter. The support through funding, mentoring and advice by the local district council and regional council staff has been tremendous throughout this restoration project. This is evidence that these councils are committed to supporting active kaitiakitanga led by iwi.

5.3.4 The expression of ūkaipōtanga as means of restoring a whānau Māori ecosystem - Aroha Spinks

As the restoration activities continued, whānau participation in the Lake Waiorongomai restoration project also increased in a way that resulted in bringing whānau members back to their ancestral landscape. Some visited for the very first time. This was evidence of ūkaipōtanga. The monthly native tree planting days throughout winter each year brought a lot of whānau back to their wāhi tapu to actively engage in kaitiakitanga, which is elaborated further within the narrative of this section. The return of whānau and hapū members visiting the lake for various reasons, continued

[930] Ngāti Raukawa ki te Tonga, Ngāti Tukorehe.

throughout the restoration project. They came for various reasons including contract work, student learning, wānanga and whānau planting days. Others visited to view the site and restoration activities as they had heard about the work underway from other whānau members.

As determined by the whānau at the first project wānanga, monthly winter planting weekends were held every second weekend of each month.[931] These were contextualised and termed 'whānau planting days' by the whānau. Rupene Waaka sent out the whānau invites via email each month. I coordinated the plants and resources. The first invitation as designed by Rupene Waaka is shown in Figure 5.3.6. Having the whānau determine the planting schedule, design their own invitations and distribute them amongst themselves is evidence of enhancing their rangatiratanga and kaitiakitanga, which in turn encouraged ūkaipōtanga.

[931] 22-23 February 2014.

Figure 5.3.6 Invitation to whānau planting days 2014 (*Source: pdf created and supplied by Rupene Waaka)*

To further explain this point, harakeke is one of the dominant remnant native plants still present at Lake Waiorongomai so this was split manually by Landross Lewis for transplanting. Harakeke is an important plant resource used traditionally by Māori for

weaving, rongoā[932], buildings and fishing. It was thus important to encourage the growth of this plant species on site. Translocating this plant species is important as it is easily hybridised. Cutting and preparing harakeke blades is hard manual work, but this hands on method of translocating keeps the original strain of harakeke present, maintaining its whakapapa to place. Whakapapa of plants is considered important to local hapū.

Landross Lewis had been skilled up on harakeke splitting during the MTM Kuku case studies by Ngā Whenua Rāhui staff members Rangimarkus Heke and Richard Anderson[933]. During another hīkoi to the lake on 10 April 2014, Landross Lewis and I were shown the technique of checking the hakakeke whakapapa and resource properties (Figure 5.3.7). Elaine Bevan[934] and long-time Ōtaki resident Sonia Snowden[935] are both weaving experts and kaiako at Poutuarongo Toi Whakarākai[936], the creative program faculty of Te Wānanga o Raukawa. They identified the whakapapa of the harakeke at Lake Waiorongomai to be the local long bladed type of flax used to make rope historically throughout the Horowhenua region. They also checked the lake edge mud for paru used traditionally to dye plant materials. However, it was not present at this location.

[932] Medicine.
[933] Richard Anderson is Huhana Smith's partner and therefore he has a whānau connection to Ngāti Raukawa ki te Tonga and Ngāti Tukorehe. He has considerable experience in restoration projects throughout New Zealand including working locally with iwi and hapū.
[934] Shareholder in Waiorongomai Block 1A, Ngāti Raukawa, Ngāti Toarangatira, Ngāti Tukorehe, Ngāti Wehiwehi.
[935] Ngāti Wai, Ngāti Hine, Ngāti Whātua, Ngā Puhi.
[936] Māori Design and Art Department.

Figure 5.3.7 Harakeke activities at Lake Waiorongomai in 2014 *(Source:photo's taken by Aroha Spinks, 10 April 2014)*

There was a great turn out on the very first whānau planting day held on 12 April 2014. The prepared flax was planted near the lake edge and spread back approximately 40metres. There were intermittent breaks between areas of plants. Plant ecologists refer to these restoration breaks as planting 'nodes', however this was contextualised and this planting pattern was renamed 'whānau' areas. Whānau of all ages were present and everyone set about working, with activities available for the young and elderly as well. Photographs taken on the day show how enjoyable these engagements in ūkaipotanga and kaitiakitanga were to whānau (Figure 5.3.8).

Figure 5.3.8 First whānau planting day (*Source: photo taken by Aroha Spinks, 12 April 2014*)

After a few Harakeke plantings, other native trees on the riparian planting plan for the KCDC Riparian Fund were discussed and agreed to with kaitiaki members and KCDC. Both the KCDC Biodiversity Officer (Rob Cross) and the GWRC Biodiversity Coordinators (Tim Park and Michael Urlich) accompanied these whānau planting days, providing important information about species being planted. Some plants needed: extra care during handling; to be planted in wet areas or in the shade; protection from the salt air to survive while others could cope in exposed areas. Additional resources were necessary this time too with weed mats, protector sleeves, bamboo stakes, garbage bags for removal of the plastic pots. All plants and resources were pre-ordered by myself and delivered to the site by whānau via four wheel drive vehicles. Prior

preparation also included Landross Lewis digging holes in the ideal planting areas.[937] The whānau members present on the day soaked up the council knowledge quickly and soon set about to actively plant their 'whānau' groupings of trees. As this first native tree planting day came to a close, one whānau member looked up and exclaimed "oh wow my nephew and his tamariki[938] have made it from Taupo."[939] With a welcome break the whānau, council members and Hans Somers left the remaining plants to ensure Dominic Bowden[940] and his crew had not made the four hour journey for nothing. Dominic Bowden's tamariki were visiting the site for the first time, one of many where whānau members brought their tamariki, mokopuna[941], nieces and nephews to their wāhi tapu for an initial visit. These examples as well as the photographs provide evidence of ūkaipōtanga, whanaungatanga and kaitiakitanga (Figure 5.3.9).

[937] Later other volunteers prepped those holes for the native tree plants. Notably harakeke was planted in the mushy wet swampy ground therefore had cow foot holes which were often taken advantage of by planting volunteers.
[938] Children.
[939] B. Ford, personal communication, 15 July 2014.
[940] Whānau member and Taupō District Council Strategic Relationships Manager.
[941] Grandchildren, descendants.

Figure 5.3.9 Ūkaipōtanga and kotahitanga at the first riparian whānau planting weekend in 2014. Photos going clockwise from the bottom right photo - Dominic Bowden and his whānau, Hans Somers, Michael Urlich (GWRC), Richard Anderson (Ngā Whenua Rāhui) with Landross Lewis and two photos of Barbara Ford (*Source: Photo's taken by Aroha Spinks, 15 July 2014)*

The final whānau planting day in 2014 saw Donovan Joyce take the initiative by placing a BBQ invite on the Maiotaki facebook site. The invitation extended was for whānau to attend the planting and celebrate after the work was done. It was a most enjoyable occasion. It was a sight to see so many whānau, lots had also travelled from Wellington. As the whānau were planting the city kids started to venture into the lake. Such tentative beginnings soon turned into pure amusement in the water and finally ended up in a mud fight. Much to the aghast and protest of mothers who looked on shouting out that they had "no spare clothes"… comments that only enthralled the other onlookers.

A quick dismissal by kaumātua Nick Albert meant the children had permission to continue and were encouraged to enjoy their fun. Finally, when the mums gave up, they allowed their toddlers and babies to strip down and meander into the shallows. After all the mahi was done we all enjoyed the sharing kai and the company of whānau and friends. It was reported later that all the children had been hosed down afterwards at 'Aunties' (Kuia Jean Albert[942]). Which again for those 'city kids' provided further amusement, and a day they may always remember. The photo collage of this final 2014 winter, whānau planting day express the values of ūkaipōtanga, whanaungatanga and kaitiakitanga at these planting events (Figure 5.3.10).

Figure 5.3.10 Final whānau planting day of 2014 (*Source: taken by Aroha Spinks, 13 September 2014*)

[942] Ngāti Raukawa ki te Tonga, Ngāti Maiotaki

These whānau planting days were very important restoration activities that gave many whānau the opportunity to be involved in the kaitiakitanga actions of the project. They also encouraged ūkaipōtanga as whānau physically got their hands and feet into the whenua and dirt. It was uplifting and fulfilling for all those who participated. At the end of the planting days whānau looked on at the planting areas they had just completed with great pride in their efforts. As the months and then years went by, they reflected on those earlier plantings with feelings of enhanced wellbeing.

With GWRC pleased with the 2014 accomplishments at the Lake Waiorongomai restoration project then granted a second phase of Iwi Environment funding. This contributed towards the completion of the fencing along the remainder of Waiorongomai Stream out to the foreshore and dune area, next to Waiorongomai Block 1A. After this funding was secured, a hīkoi was taken to determine exactly where the proposed Phase 2 fence line should go.[943] This was attended by Waiorongomai Block 1A Trustee - Nicholas (Nick) Albert[944], leasee Kathy Simcox, farmhand Hayden Neil, Rangimarkus Heke[945], Moira Poutama[946], Skip and I (Figure 5.3.11). An apology was received by the other whānau-elected Waiorongomai Block 1A Trustee - Robert (Tipi) Bevan. Nick Albert and Tipi Bevan decided that (as the whānau owner elected trustees) they did not need to inform the Māori Land Responsible Trustee[947] of the hīkoi, only the result. Firstly, they knew the Responsible Trustee would be supportive because the Trust had been withholding dividends for the purposes of fencing off the Waiorongomai Stream. The other reason was that they were asserting their rangatiratanga. They

[943] 24 September 2014.
[944] Iwi member: Ngāti Raukawa ki te Tonga, Ngāti Maiotaki
[945] Ngā Whenua Rāhui staff member and iwi member: Ngāti Raukawa ki te Tonga, Ngāti Tukorehe.
[946] Taiao Raukawa, MTM Horowhenua, hapū and iwi member: Ngāti Raukawa ki te Tonga, Ngāti Tukorehe, Ngāti Kikopiri, Ngāti Kapu.
[947] The Māori Land Trust is now called Te Tumu Paeroa.

agreed for Nick to inform and write to the Responsible Trustee informing her of the agreed plans and funding received.

Figure 5.3.11 Hīkoi for phase 2 fence planning (Source: taken by Aroha Spinks, 24 September 2014)

During the hīkoi I explained to those present that although the Lake Waiorongomai 10 Trust had through Ngā Hapū o Ōtaki secured the funding from GWRC, all those who benefited from the funding needed to contribute in some way. I ensured that the leasee was made aware that she had the responsibility in the future of maintaining the fence. She was already responsible for ensuring her cattle did not contaminate waterways under the Resource Management Act and therefore needed to ensure the fencing remained intact. The leasee chose to donate labour and remove the old inadequate single line of fencing that actually crossed the stream randomly. The continued responsibility of maintaining the fence is an example of the owners, the leasee and council all expressing kaitiakitanga towards this ecosystem.

I conveyed to Nick Albert the whānau and hapū request for a camping area showing him the historical Rikihana camping site. Marked by an old macrocarpa tree, it sat alongside the Waiorongomai Stream - about 300 metres from the beach. He agreed to donate and include a reasonable piece of Waiorongomai Block 1A land surrounding this location to the restoration area for that purpose in the future. The leasee also listened to the kōrero and although not party to the decision, she was made aware of the reason for this area of land being set aside. This significant action was later agreed to by Tipi Bevan. The actions of these two Trustees showed support for whānau aspirations to increase the number of whānau members returning to visit their wāhi tapu. An example of ūkaipōtanga, this camping area made possible the future use of this site for recreational and cultural purposes. The restoration area that was retired from farming in Phase 2 was approximately 10 metres distance on each side of the Waiorongomai Stream.

With Roy Winterburn being unavailable, Skip began the second fencing project assisted by Meihana Taurima[948] and Tuihana Nikora-Whiting[949] on 21 November 2014 (Figure 5.3.12). They completed the Phase 2 fencing over the summer of 2014-2015. Finishing the entire Waiorongomai Block 10 fence line on 2 February 2015 was a momentous occasion for the restoration project and the whānau/hapū. The project site was protected by placing locks on all the gates, an action that expressed rangatiratanga, kaitiakitanga and kotahitanga.

[948] Ngāti Kahunungu, Te Āti Awa.
[949] Local teacher at Ōtaki Primary School, in Te Korowai Whakamana, the te reo Māori only speaking education strand. Te Whānania-Apanui, Te Whakatōhea, Te Ati Hau Paparangi, Te Aitanga-ā-Mahaki.

Figure 5.3.12 Fencing of the Waiorongomai Stream (Phase 2) completing the restoration area and padlock on the restoration front gate of the Lake Waiorongomai restoration area. Photo's clockwise from the top left, Meihana Taurima digging initial post holes *(Source: photo taken by Aroha Spinks, 11 November 2014),* Skip in action fencing alongside photo of Meihana Taurima and Tuihana Nikora-Whiting *(Source: photo's taken by Aroha Spinks,18 January 2015),* bottom three photos are of phase 2 fence lines completed *(Source: photo's taken by Aroha Spinks, 05 February 2015)*

The completion of the Lake Waiorongomai restoration project fences achieved two very important points, it kept the cattle out of the Waiorongomai Stream and it reinstated the ephemeral wetlands. No longer eaten by cattle, weeds now choked the Waiorongomai Stream and increased the water level throughout the wetlands. This, along with a very wet winter with record rainfall[950], caused flooding throughout the region and particularly in Waiorongomai Block 3B2 (Figure 5.3.13). This result pleased whānau as they were aware that ephemeral wetland flooding resulted in the provisioning of food for eels. This same event was not seen in a positive light by the leasees who looked

[950] Twice the average monthly rainfall for four months in a row.

upon the sight in genuine displeasure. After discussions and site visits by myself they were informed of the hapū decision to allow nature and Papatūānuku to take her course. "She is healing herself" they were informed.

Figure 5.3.13 The 2015 flood that increased the level of the lake and reinstated the surrounding ephemeral wetlands. (*Source: Photo's taken by Aroha Spinks, 18 May 2015)*

This was not the only complication that the flooding caused however. The second Lake Waiorongomai Restoration Wānanga (held 13 June 2015) brought the whānau up to date with progress in the morning and in the afternoon another hīkoi to the lake discovered major flooding. This made the Riparian Planting Plan for 2015 impossible. No vehicle could get around the north end of the lake to the west side where our volunteers had prepared the 1000 holes. I discussed this predicament with Te Waari Carkeek and Rupene Waaka who concurred there was a need to plant a reduced number of plants on east side of the lake, even though it was an undesirable location. The

ground was too wet for most of the species ordered the year before. Te Waari explained to me that the action of planting by the whānau was just as important as the rate of plant survival. This is evidence that ūkaipōtanga was as important as kaitiakitanga. The whānau came up with their own new adaptive strategy for the following plantings by rowing the plants across the lake which is described in more detail in Chapter 6 (Sub-section 6.2.5).

Te Waari Carkeek rallied around his whānau for the next whānau planting day and a lot of them turned up. One of the kuia, Queenie Rikihana-Hyland commented in light hearted humour afterwards that she felt like she "had been to a Carkeek Reunion"[951]. Te Waari's comment that day was that it felt like a "hauora hui",[952] a meeting about improving health and wellbeing. The day was photographed by Billie Taylor and an article included in the Te Whakaminenga o Kāpiti Iwi Newsletter (Hōngongoi[953] 2015), (Figure 5.3.14). This was the only known article produced on the Lake Waiorongomai Restoration Project because it was organised and approved by the whānau and hapū. By the 2015 whānau planting days, each time a new whānau turned up the regulars would delight in seeing them. The new crew were made to feel very welcome and taught the techniques by their whānau. Whānau planting days were a prime opportunity for the expression of ūkaipōtanga, whanaungatanga, kaitiakitanga and pūkengatanga. All of which led to the improved wellbeing of the Waiorongomai ecosystem wellbeing and mauri.

[951] Q. Rikihana, 13 June 2015, personal communication.
[952] T. Carkeek, 13 June 2015, personal communication.
[953] June-July on the Māori lunar calendar.

Lake Waiorongomai whānau planting

pōhuehue (muehlenbeckia)

taupata

Ngā Hapu o Ōtaki Planting Group didn't take long to bed down 250 plants at this sacred site on a windy afternoon.

Saturday 13 June saw a great turn out for the Lake Waiorongomai Restoration Project Wānanga and Whānau Planting day. This hapū led project has been actively engaged in improving the ecosystems and wetlands surrounding the sacred site for just over a year now. Actions to date include fencing the Waiorongomai 10 Block completely off from cattle, new culverts to allow fish passage, over 1500 eco-sourced native plants, ecological monitoring, pest and weed control programs along with other positive measures including local kura involvement.

Overall governance and guidance is provided by Ngā Hapū o Ōtaki and the individual Block Trusts, (Lake Waiorongomai 10 Trust and Waiorongomai 1A Trust). Along with the strong whānau and hapū engagement this collaborative project has also received positive involvement by the leasee farmers and external assistance that is aiding in its success. Significant advice and funding has been provided by Greater Wellington Regional Council and Kāpiti Coast District Council.

Other organisations and individuals who have helped along the way include Ngā Whenua Rahui, Whakatupuranga Rua Mano, Te Rito, Te Wānanga o Raukawa, Hapai Consultants, Forest and Bird Horowhenua, Skipper Fencing and other Iwi kaitiaki. This case study is one of six supported in the region by Taiao Raukawa Iwi Environmental Research Unit and the Manaaki Taha Moana Project .

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Aroha Spinks

Tony Manning plants after ????????? has thrown in fertiliser bullets.

Graham Winterburn gets stuck in .....

Amiria Wilcox ensures protection with this sleeve.

Figure 5.3.14 Whānau planting day 13 June 2015 article in Te Whakaminenga o Kāpiti[954]

[954] Te Whakaminenga o Kāpiti, Hongongoi 2015, Lake Waiorongomai whānau planting, p. 16.

5.3.5 The expression of pūkengatanga as means of restoring a whānau Māori ecosystem - Aroha Spinks

A kaupapa that emerged as important to the Waiorongomai whānau during the restoration process was 'pūkengatanga'[955] and this included a focus on knowledge development amongst all generations. There were many opportunities to teach and share knowledge during the Lake Waiorongomai restoration project, as well as the doctoral research endeavour. Whānau learnt restoration techniques during wānanga, hīkoi and whānau planting days as described earlier in the chapter. This section is thus dedicated to the students of the local learning institutes that became involved in the Lake Waiorongomai restoration project.

The learning institutes that became involved in the Lake Waiorongomai restoration project were: Te Kura-ā-Iwi o Whakatupuranga Rua Mano (Whakatupuranga Rua Mano), Te Kura Kaupapa Māori o Te Rito (Te Rito), Te Wānanga o Raukawa and He Iti Nā Mōtai. Rolly Raureti, a kaitiaki team member and science teacher at both Whakatupuranga Rua Mano and Te Rito, was keen to have older students involved. He initiated the tono to the two kura whose principals and whānau approved. Te Wānanga o Raukawa kaiako pūtaiao: Caleb Royal[956], Pātaka Moore[957], Rawiri Richmond[958] and Jessica Kereama-Stevenson[959] included their students regularly for example: planting, monitoring and wānanga. Ōtaki College was the next learning institute to approach the whānau and kaitiaki team to request permission to be involved in learning opportunities in the restoration project. Unfortunately their curriculum and the duck shooting season coincided so, although approved by the kaitiaki their hīkoi did not go ahead. Whānau

[955] Teaching, learning and educating in a Māori way, passing on knowledge so that others become learned or proficient.
[956] Ngāti Raukawa, Ngāti Pare.
[957] Ngāti Raukawa, Ngāti Pareraukawa.
[958] Ngāti Raukawa, Ngāti Tukorehe.
[959] Ngāti Manomano, Ngāti Takihiku.

member Kelly Tahiwi, the manager of He Iti Nā Mōtai, organised a site visit with the young pre-school children that attend their Whare Kōhungahunga.[960] Narratives in this section provide an outline of the highlights of these learning experiences. In particular, taking tamariki out to the lake was always rewarding.

Many students at both kura (Whakatupuranga Rua Mano and Te Rito) have iwi, hapū and whānau connections to Waiorongomai. As whānau member Deanna Rudd stated at a wānanga, "Lets involve the kura as the whānau are the kura and the kura are the whānau."[961] The inclusion of local students in the restoration project provided real life learning, that extended their curricula and enhanced their knowledge development. For example, they developed their roles as kaitiaki in the practical applications of looking after their whenua, planting native trees and respecting wāhi tapu. Capacity building of students was made possible through knowledge transfer from whānau, hapū and iwi members, as well as from external supporters involved in wānanga and hīkoi to Lake Waiorongomai. Students and teachers enjoyed the active learning gained through experiences on site at Lake Waiorongomai and their contribution to cultural survival. This, in my opinion, was a special element of the restoration project and this research.

Whakatupuranga Rua Mano were inspired by the Lake Waiorongomai Restoration Project. By being involved in this project they made council connections which eventually led to them starting a riparian planting regime along their nearby stream. I first met with the principal of Whakatupuranga Rua Mano, the late Harina Cooper (nee Raureti)[962] who was also Betty Raureti's daughter.[963] I outlined the Lake Waiorongomai restoration project plans and discussed the potential for kura students to

[960] Early childcare centre that is immersed in te reo. Similar to a kohanga reo.
[961] D. Rudd, personal communication, 15 July 2015.
[962] Ngāti Raukawa, Ngāti Kapu, Ngāti Maiotaki, Ngāti Moewaka.
[963] 14 February 2013.

be involved. We discussed the opportunity for older science students (being taught by her brother Rolly Raureti) to conduct the fish data collection, thus contributing to the ecological monitoring aspect of the doctoral research endeavour. Harina reminisced on the lake level being much higher as a kid and walking around the sand dune hills to get around the lake. Harina informed me that she would discuss that whakaaro[964] at the next whānau hui for the kura. Rolly Raureti informed me at a later date that the whānau had approved the opportunity. This is an example of rangatiratanga. The kura and whānau followed their own process seeking collective agreement and tikanga approval.

Whakatupuranga Rua Mano students, through their involvement in the restoration project, created increased awareness of artistic, creative, scientific, environmental and local governance careers. For example, during their first hīkoi they interacted and accompanied the Victoria University Landscape Architecture students.[965] Coordinated by Rolly Raureti it was envisaged that their kura students would see the landscape, biodiversity and water quality improve over time. The photo below shows the enthusiasm of youth enjoying the atmosphere at Lake Waiorongomai and nearby beach (Figure 5.3.15).

[964] Thought, plan.
[965] 14 March 2013.

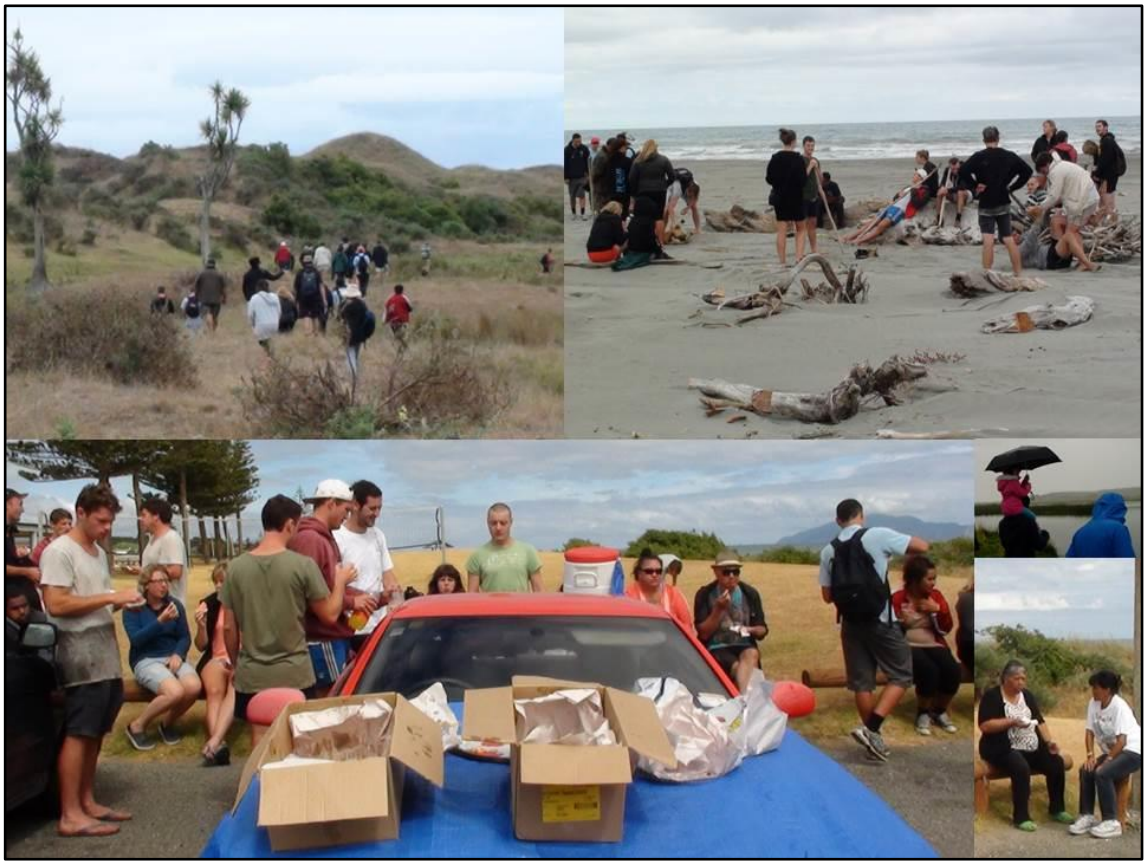


Figure 5.3.15 Te Kura-ā-iwi o Whakatupuranga Rua Mano students attend a hīkoi with Victoria University Landscape Architecture students (*Source: photo's taken by Aroha Spinks, 14 March 2013*)

The next wānanga for the Whakatupuranga Rua Mano art students revolved around the Rae ki te rae exhibition held at the Wellington City Gallery in November 2013 by contemporary iwi artist, environmentalist, MTM Horowhenua Project Manager Dr Huhana Smith[966]. The art teacher, Tetahi Takao[967] and I coordinated a two day wānanga (19 November 2013) which included four presentations, a hīkoi to Lake Waiorongomai and a trip to Wellington (Agenda in Appendix 3).

The first presentation by Wai Familton provided an overview of the Wellington City Gallery, recent exhibitions and a description of her role as 'Liaison Educator (Māori)'

[966] Ngāti Raukawa ki te Tonga, Ngāti Tukorehe, Ngāti Kapu. Huhana Smith was one of the co-supervisors for this Doctoral Research. At the time of publishing this thesis she now held the position of Head of School Arts at Massey University Wellington receiving the title Associate Professor.
[967] Te Āti Awa, Ngāti Rārua and Ngāi Tūhoe.

for the Gallery. Next Huhana Smith spoke of her role in MTM and how this experience inspired her artistic expressions and the environmental messages she expresses through her paintings (Figure 5.3.16). It was hoped that students would also aspire to create great art. I then provided an outline and update of the Lake Waiorongomai restoration project and how my doctoral research incorporated mātauranga Māori and ecological science. The students laughed when I described the difficulty of counting and trying to identify the extremely fast microscopic aquatic insects. My use of a supporting video clip provided proof as they witnessed the very small bugs zipping across the screen. As young persons attention spans at this point may have started to wander, it was lucky for us that Rupene Waaka finished the line up of presentations. His humour, along with his prowess as a lecturer at Te Wānanga o Raukawa, enthused the students along with his kōrero on 'A Kaitiaki Perspective'.

Figure 5.3.16 Rae ki te rae exhibition of paintings by Huhana Smith (Source: Wellington City Gallery)

That afternoon, the teachers and I took the students on a hīkoi out to view the restoration area. This seemed like an escapade to some students who enjoyed venturing up the hill through the tall grass. Other students just found that it itched their legs! After Tetahi Takao conducted our karakia the students settled down to take in the view of the lake and feel the mauri. Drawing on their imagination and inspiration they all began to sketch. One lad added humour to our day as he was mocked for springing up and screaming when a spider crawled up his leg. The second day of the wānanga was planned for the students to: (i) receive a screen printing tutorial at the Wellington City Gallery; (ii) exhibit their work based on the sketches of Lake Waiorongomai and; (iii) receive a tour of the Victoria University Landscape and Architecture campus. Unforeseen circumstances prevented the second day's activities, which was a shame for the students. However, I am sure they enjoyed the outdoor experience and I hope this programme may inspire similar collaborative learning opportunities within our communities.

Tanira Cooper coordinated the next hīkoi for Whakatupuranga Rua Mano students to the lake to partake in a monitoring exercise with the science students (31 March 2014), accompanied by Te Waimarino Ropata[968]. I asked my co-supervisor to be the guest speaker - Associate Professor Russell Death, known at the time as Dr Death. Just the mention of his name intrigued the students. On arrival at Lake Waiorongomai Tanira Cooper conducted our karakia, then he provided a short kōrero on his recent contribution to the restoration project, proudly pointing out the new fence and the batons that he had helped to staple into place. A photo taken that summer of his son (only a few months old at the time) holding a hammer to help with the fencing had hit

[968] ART Iwi member: Ngāti Toa Rangatira and Trainee Teacher.

facebook like a storm, proving that, you can never be too young to learn. Pūkengatanga has no age barrier.

Russell Death provided the students with insights into the basics of ecology and his interest in macroinvertebrates.[969] Students participated in retrieving the fish nets set the night before. They also identified and counted fish, eels and aquatic insects. As the students frolicked about during their hīkoi they made associations to help them memorise the scientific names. These names typically had a young perspective twist as well as a Māori flavour, some examples are provided Table 5.3.2.

Table 5.3.2 Mnemonics created by Whakatupuranga Rua Mano students

Scientific name	**Students' mnemonic association**
Hirinidae	Hirini
Mysid shrimps	My space
Galaxidae	Galaxy
Amphipods	I pods

Tanira Cooper reflected on an aspect of Russell Death's explanation of wetlands having a cleansing function similar to the kidney's in the human body. Tanira Cooper mentioned that this was "easy to relate to, as our mātauranga explains our whakapapa which extends back through time to Papatūānuku[970]. She is just as alive as we are."[971] This was one example of how the explanation of a western ecological science concept was deemed similar to mātauranga understandings of the natural world. This example and the holistic concepts of ecology (that evolved out of western science epistemology)

[969] Tiny aquatic insects, worms, snails, mussels etc.
[970] (i.e. earth mother)
[971] T. Cooper, personal communication, 31 March 2014.

was readily accepted by kaiako, rangatahi[972] and whānau. This example shows that science disciplines can align with iwi and hapū restoration projects.[973]

Now to introduce the other local kura that joined in the activities at Lake Waiorongomai. Te Rito physical education students and their teacher, Hika Pene[974], already made regular visits to Lake Waiorongomai, as they did fitness training through paddocks and out along the stream to the sea and back to school. Since their first run through the restoration area the physical education students have continued to witness changes on site.[975] Te Rito already had a kaitiakitanga program in place that involved planting native trees around their school. Thus, it was a natural progression for them to be involved in this local hapū-led project.

As mentioned Rolly Raureti along with some of the other teachers (who are also whānau and hapū members of Waiorongomai), began to express an interest in the project as a learning opportunity for their students. I attended a hui with the principal Janey Wilson[976] and teacher/whānau member Roimata Baker[977].[978] We discussed the learning opportunities at Lake Waiorongomai and the wānanga I was conducting with Whakatupuranga Rua Mano. Both teachers agreed that the kaupapa aligned with their kura vision. They informed me that they would discuss the potential of their student

[972] Youth.
[973] Dr. Shaun Ogilvie comments that mātauranga Māori and applied ecology are often seen as competing in literature however he poses that they are intrinsically close. "There is a really strong parallel between applied ecology, ecology in general, but applied ecology specifically and a lot of the fundamentals within mātauranga Māori in a practical natural environment sense." (5 minutes, 38 seconds) Ogilvie, S., 2013, Mātauranga Māori and applied ecology: naturally coupled in the natural world, 23 April, video presentation on the website for Ngā pae o te Māramatanga, the University of Auckland www.mediacentre.maramatanga.ac.nz/content/matauranga-maori-and-applied-ecology-naturally-coupled-natural-world
[974] Ngāti Kauwhata.
[975] 31 January 2014.
[976] Ngāti Raukawa, Ngāti Huia ki Katihiku, Ngāti Toarangatira. Iwi member and Ngā Hapū o Ōtaki member.
[977] Ngāti Raukawa, Ngāti Pare. Iwi member and Ngā Hapū o Ōtaki member.
[978] 22 October 2014.

involvement at their next whānau hui. The whānau at that hui approved the active participation of high school students in the Lake Waiorongomai restoration project.

First, I talked to the year 9 and 10 science students about the Lake Waiorongomai restoration project, doctoral research aspects of the project and the ecological monitoring at the lake.[979] Next Michael Urlich talked to the students about his role as GWRC Biodiversity Officer[980]; the biodiversity department; local restoration projects; and his career. The students seemed to be interested in the fact that along with indoor aspects he got to enjoy outdoor activities and liaise with iwi as well. One aspect of the Lake Waiorongomai restoration project was to involve students in the expression of kaitiakitanga and thus inspire possible career opportunities in this space.

The following week we held a wānanga and hīkoi at the lake for the students, who became actively engaged in the project.[981] The wānanga began with a karakia, led by one of the students. Landross Lewis provided the students with a demonstration of his newly acquired skills in setting up and setting off the rodent traps. Landross stressed that the traps are indeed very dangerous and can sever a hand or fingers. This of course gained their attention and all were on alert as they started their hīkoi. The students and teachers headed off to observe a dead baby ferret in a nearby trap that I had informed them of. On the way, the students and teachers observed the new culvert recently placed into the northern drain as well as the fencing going on around it.

As the students made their way around the lake I was responsible for driving Rolly's four wheel drive with Kuia Queenie Rikihana-Hyland and colleague Moira Poutama. Queenie Rikihana-Hyland is an author and story-teller who provided the students with

[979] 28 October 2014.
[980] Michael Urlich was newly appointed as his role expanded to include the Kāpiti region after Tim Park. Tim Park left the GWRC and was employed in a similar role by the Wellington District Council.
[981] 07 November 2014.

an oral narrative as she stood on top of an old dune. The students laid about on the grass taking in the tale. She spoke of her tūpuna arriving in the area, and of scenes as a child collecting kaimoana and distributing kai to the whānau throughout the township. After Queenie Rikihana-Hyland's descriptive kōrero, the students joined her in planting a grove of harakeke (Figure 5.3.17). Some students were keen to partake, others took a little coaching as their 'flash shoes'[982] were less than ideal for the muddy wetland. However as the students ate their lunch on the sand dune after planting and karakia, all were very proud of their restorative efforts.

Figure 5.3.17 Te Rito wānanga, hīkoi and involvement in the Lake Waiorongomai restoration project (*Source: photo's taken by Aroha Spinks, 07 November 2014*)

After lunch the group returned to the shallow eastern side of the lake to retrieve the nets set the night before, most of the students were reluctant. Lucky there was at least one

[982] Which became a nickname for those who wore them to a wetland hīkoi.

keen player not shy at getting dirty or wet in the process. Fortunately she also had the gift of a negotiator and persuaded another friend to accompany her into the water and hold on to the other end of the net. All the students were well aware it was eel habitat. There was commotion upon seeing and then later releasing the eels, as the students were well aware of their slippery slimy bodies and sharp teeth. Their teacher, Rolly Raureti had perhaps told them a few fishing stories. However, he is a military trained hunter and gatherer well skilled in the practices of setting nets, preparing and consuming traditional foods. The students' excitement turned to disappointment as they realised that all the eels in the hīnaki were too small to pāwhara[983] and smoke. The students remained optimistic though that they would one day be part of a wānanga and due to the whānau restoration efforts find edible sized eels. After recording the fish counts, the excursion ended and the exhausted bunch headed back to the vehicles and returned to kura. This is one example of a Te Rito wānanga and hīkoi that provided numerous pūkengatanga opportunities and experiences to students. Incorporating learning outdoors in a local hapū-led restoration project can be very rewarding and inspiring as students are able to relate the theories learnt within their classrooms to real-world experience.

The two annual plant inventories provided further pūkengatanga opportunities. Lisa (Lil) Keen[984] (a pūtaiao student at Te Wānanga o Raukawa) and myself learnt alot about native wetland and dune plants; and about the weeds that were present at Lake Waiorongomai. Tim Park[985] and Pat Enright[986] shared their knowledge while collecting data. Tim Park showed us how to collect seeds and cuttings from various plants. The

[983] Hanging, filleting by splitting down the backbone, removing the internal organs, salting and drying in a traditional Māori process.
[984] Iwi member: Ngāti Raukawa ki te Tonga, Ngāti Kauwhata and Te Wānanga o Raukawa pūtaiao student and mum to whānau member Pukohurangi te ata Hapeta.
[985] GWRC Biodiversity Coordinator.
[986] Reknowned New Zealand Botanist.

seeds and cuttings were given to Waitohu Streamcare Group to grow for the Lake Waiorongomai restoration project. The Waitohu Streamcare Group have a strong relationship with GWRC and MTM and are very passionate riparian planters with their own nursery at Ōtaki Beach. The group willingly took these precious plant materials and nurtured them. Lisa Keen attended Waitohu Streamcare Group planting days after the introduction. She learnt a number of propagation techniques and cared for the Waiorongomai seedlings on behalf of whānau. In spring 2015, the Waitohu Streamcare Group conducted a transplanting wānanga at the Te Puna nursery of Te Wānanga o Raukawa. The group taught the Te Rito students and teacher Roimata Baker techniques of transplanting the sedge seedlings from Waiorongomai into bigger pots. Te Rito continued to maintain a relationship with the Waitohu Streamcare Group which led to dune restoration hīkoi and wānanga at Ōtaki Beach. This pūkengatanga opportunity built a relationship between this kura and a local environment group from the community, based on an expression of kotahitanga.

My final reflection for this section is to describe one of the most precious hīkoi I experienced with the babies from He Iti Nā Mōtai.[987] To begin, the whānau impressed me by going ahead with the plans even though the winter weather had a slight drizzle. They had all the babies rugged up in warm jackets with hats and some were so small they were carried in back packs.[988] Before entering the paddock, the babies and whānau said their karakia, then meandered through the cattle on their hīkoi. Te reo Māori was used throughout this excursion. I drove the plants through the paddock to the restoration gate where each baby received a native plant. Most struggled with the weight and through the long grass a short distance to dig holes. Staff had brought a few small spades for the tamariki who enjoyed working with the adults. Most were quite

[987] 14 September 2016.
[988] Babies can start at young as 9 months old at this early childhood centre.

serious about the job, proudly stomping in their tree once planted. The youngsters were enthralled with the dirt which quickly turned to mud in the drizzle, as well as the insects - especially the 'noke'[989]. Andrea Rosser[990] and I collected water and aquatic insects after the planting. The children's faces shone as they exclaimed in te reo, the names of the different insects and shrimps swimming about. All were a little sad when we had to return them to the lake, but Andrea informed them that their whānau were waiting for them and this brightened their little faces. To end the pūkengatanga occasion, the tamariki and adults sang a gorgeous waiata. Truly a memorable moment. The expression of pūkengatanga, kaitiakitanga and kotahitanga continues into the future with all these learning institutions still involved.

5.3.6 The expression of kotahitanga as means of restoring a whānau Māori ecosystem - Aroha Spinks

Following on from the involvement of the learning institutes during the Lake Waiorongomai restoration project, the whānau and hapū also received assistance from external sources. Cohesian within the whānau and hapū continued throughout the project. However, new external relationships increased over time showing growth and development of kotahitanga. Kotahitanga added momentum to the hapū-led project. Iwi support and wider community involvement all strengthened the restoration activities. Essential funding and mentoring at the beginning of the project from external agencies such as GWRC, KCDC and DoC continued. This section resumes the Lake Waiorongomai restoration project journey by reflecting on examples of external support that evolved throughout the Lake Waiorongomai restoration project.

[989] Worms.
[990] Ngāti Pākehā.

It is appropriate to acknowledge that the whānau and hapū were the first to come together in an act of kotahitanga to work on the common goal of restoring Lake Waiorongomai. The communication, planning, innovative ideas generated, practical activities, contractual work, annual wānanga and whānau planting days are all aspects of kotahitanga detailed earlier in this chapter. This narrative now highlights the external assistance that supported the Lake Waiorongomai restoration project that also contributed to it's success.

The baseline ecological monitoring discussed later in this thesis (Chapter 7) is a perfect place to start a narrative about kotahitanga as this activity was contributed to by many. Caleb Royal and whānau conducted the eel monitoring first. Te Rito students and a Te Wānanga o Raukawa pūtaiao student Lisa Keen[991], were involved in recording the fish monitoring data. My nephews, Reuben Bennett[992], Manaia Bennett-Smith[993] and Heremia te tihi Bennett-Ogden[994] helped me on two occasions to set fish nets before kura wānanga. Landross Lewis helped me with setting and retrieving fish nets set on 14 November 2014. The Forest and Bird Society Horowhenua conducted regular (3 monthly) bird monitoring surveys. Tim Park (GWRC Biodiversity Coordinator), Pat Enright (Botanist), Lisa Keen and myself all contributed to the creation of a plant inventory. Many volunteers helped me to conduct the quarterly water quality and aquatic insect monitoring (Lisa Keen, Hayden Jacobs[995], Ursula Keswick[996], Iritana

[991] Iwi member: Ngāti Raukawa ki te Tonga, Ngāti Kauwhata and Te Wānanga o Raukawa pūtaiao Student and mum to whānau member Pukohurangi te ata Hapeta.
[992] Iwi member: Ngāti Tukorehe, Ngāti Porou and student at Whakaktupuranga Rua Mano. 30 March 2014.
[993] Iwi member: Ngāti Kahungunu, Ngāti Porou, Ngāti Tukorehe and student at Whakatupuranga Rua Mano. 06 November 2014.
[994] Iwi member: Ngāti Raukawa, Ngāti Tukorehe, Ngāti Kapu, Ngāti Porou and student at Kereru Kōhanga Reo. 06 November 2014.
[995] Iwi member: Ngāti Raukawa ki te Tonga, Ngāti Wehiwehi and Te Wānanga o Raukawa pūtaiao student.
[996] Associated iwi member: Ngāti Raukawa ki Te Kaokaoroa o Pātetere, whāngai Ngāti Raukawa ki te Tonga (my step daughter) and Te Wānanga o Raukawa te reo student.

Bennett[997], Reuben Bennett[998], Ariana Raika[999], Pikitia Skipper[1000]). Alton Perrie and Brett Cockeram from the GWRC Science Department in Masterton calibrated, lent, sent and downloaded data from Dissolved Oxygen and Salinity Meters. Figure 5.3.18 illustrates some of the collective contributions made in this ecological monitoring area.

Figure 5.3.18 Ecological monitoring participants. Photo's clockwise from top left, Caleb Royal and son measuring the length of eel, Caleb's son & nephew rowing out to get hīnaki, (*Source: photo's taken by Rupene Waaka, mid February 2013)*, Iritana Bennett water quality sample collection (*Source: photo taken by Huhana Smith, 28 January 2014),* Tim Park (GWRC) and Pat Enright looking at hornwort during plant inventory (*Source: photo taken by Aroha Spinks, 18 January 2015*, Ariana Raika (*Source: photo taken by Huhana Smith, 28 January 2014),* the Forest and Bird Society Horowhenua with Lisa Keen, Hans Somers and Tim Park (*Source: taken by Aroha Spinks, 31 January 2014),* macroinvertebrates and eels, center photo Pikitia Skipper (*Source: photo taken by Huhana Smith, 28 January 2014).*

[997] Iwi member: Ngāti Tukorehe, Ngāti Porou and Whakatupuranga Rua Mano student.
[998] Iwi member: Ngāti Tukorehe, Ngāti Porou and Whakatupuranga Rua Mano student.
[999] Iwi member: Ngati Wehiwehi and Nga Puhi as well as a Whakatupuranga Rua Mano student.
[1000] Iwi member: Ngāti Raukawa ki te Tonga, Ngāti Kikopiri, Te Āti Awa and Ōtaki Primary Te Korowai Whakamana Student.

A Key Native Ecosystem Report on Lake Waiorongomai was developed by GWRC staff, members of the kiatiaki team, and myself. It is envisaged to be printed by GWRC and made available on their website, an action deemed important by kaitiaki to gain hapū approval. The material within the final draft report incorporated ecological data collected for this doctoral thesis. Hence the kaitiaki team placed the document on hold for hapū review until after the release of this thesis. The GWRC Biodiversity Manager, Richard Romjin, respected this decision and the department placed an embargo on the document. GWRC still recognise Lake Waiorongomai as a Key Native Ecosystem internally and are waiting for hapū approval to advertise externally on their website. GWRC secured three years of biodiversity funding for the Lake Waiorongomai restoration plans contributing to restorative measures (such as pest control and further culverts). On establishing Lake Waiorongomai as a Key Native Ecoystem within the region, GWRC also liaised with KCDC, who agreed to secure biodiversity funding for weed control and riparian planting for the next three years. GWRC and KCDC chanelled the biodiversity funds through to Nga Hapū o Ōtaki who then administered and organised the restoration work. This is just one example of the positive collaborative relationship that Ngā Hapū o Ōtaki has built with the regional and local district councils. This example of kotahitanga also provides evidence that these councils respected the rangatiratanga asserted by the whānau and hapū, and were willing to adhere to local tikanga within their resource and environment planning.

GWRC Pest Control staff member Gary Sue (Senior Biosecurity Officer) contacted Rupene Waaka in regards to reviewing the traps at the Lake Waiorongomai restoration project as part of maintaining this Key Native Ecosystem. In addition, the auditing staff member was new to the site. Rupene Waaka provided approval and requested that the staff member contact myself. The staff member Darren Lees was informed that, due to

the visit being his first, he would need to have a karakia performed by a whānau or hapū member. He agreed to this tikanga and, due to earlier commitments by others, he met my mum Eila Paul[1001] on site. Eila performed the karakia for him at the gate. Darren Lees asked if he could say his mihi, which was very appropriate. Afterwards Darren described how he rarely had the opportunity to use te reo Māori and expressed his gratitude for this occasion. Evidence that the hapū-led restoration project also provided opportunities for persons of other cultures to also express mātauranga and te reo Māori. This example shows the expression of kotahitanga, rangatiratanga, wairuatanga, tikanga and te reo Māori.

The following narrative introduces a local gravel company that donated resources to the Lake Waiorongomai restoration project. During the first two years of this restoration project I drove my vehicle, a 1998 Mazda Familia through puddles and paddocks surrounding Lake Waiorongomai. I earned the nickname 'Possum Bourne' from Landross Lewis for the execution of flying at six metre puddles and sliding through the mud in true kiwi country rally car racing style. At times my car was almost completely covered in mud, sometimes it remained that way all week, much to horror and embarrasment of my children, who would sink down low in my back seat. Personally I was quite proud of the evidence that I was a hardworking out-in-the-environment wahine.

However, I eventually approached a kaumātua about the fact that the condition of the last 1km of the road was very likely ruining the mechanics of my vehicle. He replied that improving the state of the road might encourage non-whānau to bring their vehicles to explore further down the discreet road. He worried that vandalism, hoon driving, and

[1001] Hapū member: Ngāti Raukawa ki te Tonga, Ngāti Tukorehe, Ngāti Kapu, Ngāti Wehiwehi, Ngāti Toarangatira, Ngāti Raukawa ki Te Kaokaoroa o Pātetere and Tainui.

rubbish would increase in the sacred site. These activities could also be detrimental to hapū relationships with the local farmers. I respected the decision and prayed my vehicle would last the distance. During the winter planting of 2015 however, this decision changed.

My friend, fellow doctoral student and whānau member Arini Loader[1002] was driving her uncle and kaumātua Nick Albert in his small city vehicle out to a whānau planting day. Now Nick had been in the New Zealand Army, so imagine an imaculate car both inside and out. Unfortunately, she took a tentative approach to the largest puddle which saw her and Uncle Nick stuck, stranded in the middle. When they ventured out of the vehicle to participate in the planting, the vehicle flooded with mud and had to be towed away for a complete makeover. After a stern discussion with Nick, I was instructed to take this matter up with the kaitiaki team again. This time, given the rangatira status of another kaumātua involved, I was given the green light.

I firstly point out that Ngā Hapū o Ōtaki had already negotiated a Memorandum of Understanding with a local gravel company operating in the Ōtaki River. This company recognised the rights of iwi (as outlined in the Treaty of Waitangi). Thus, they had agreed with Ngā Hapū o Ōtaki to the request to receive gravel free of charge for hapū and iwi purposes. Rupene Waaka emailed the Winstones Head Office manager, Dan McGregor, Projects and Policy Advisor, and informed him of the hapū requirement and noted myself as the contact.[1003] I then coordinated the provisioning of gravel with the local Ōtaki Office supervisor Shane Hagai, who assessed the site. Within one week, seven truck loads of gravel (worth approximately $2000) were delivered and laid. (See before and after photos Figure 5.3.19). Winestones contribution provides an example

[1002] Now Dr Arini Loader and History Lecturer at Victoria University in Wellington. Whānau member: Ngāti Raukawa, Ngāti Maiotaki, Te Whānau-a-Apanui, Ngāti Whakaue.
[1003] D. McGregor, personal communication, email 31 July 2015.

of the expression of kotahitanga as they freely provided materials as well as their services to aid the project. They also acknowledged rangatiratanga by supporting iwi rights guaranteed to them by the Treaty of Waitangi.

Figure 5.3.19 Before and after gravel was added to the road leading into Lake Waiorongomai and at the entry to Waiorongomai 3B2 (*Source:Top photo's taken by Shane Hagai, 11 September 2015, bottom left photo taken by Aroha Spinks, 13 June 2015, bottom right photo taken by Aroha Spinks, 05 October 2015*)

Kathy Simcox is the leasee for Waiorongomai 1A located by the Waiorongomai Stream. She also contributed to restoration activities on a number of occassions. For example, Kathy and husband Dave helped me assess the possibilities of travel around Lake Waiorongomai in the second winter of the project. They met me at the lake with their four wheel drive motorbike and we explored the different possibilities. With their farming experience they showed me the best track with Waiorongomai 3B2 along existing shallow dune rises. Unfortunately, on the next whānau planting day, one driver

went just that little bit further than the front vehicle I was leading and ended up stranded in the mud. The whānau rallied around in true kotahitanga style and, with a bit of physical strength, in no time the vehicle was back on high ground.

Hans Somers is the leasee for Waiorongomai 3B1, 3B2 and 3B3. He cares for the Waiorongomai Blocks also. Along with his late wife Erna Winterburn-Somers[1004] they made major contributions of land around the lake to the restoration project, allowed access and provided advice. From a farmer‘s perspective he tended to focuss on grazing potential, but also valued Lake Waiorongomai. Both Hans Somers and Erna Winterburn-Somers attended the first LWRP Wānanga[1005] and provided input into the plans. Hans Somers participated in two of the early whānau planting days as well.

Hans Somers is often poetic in his speech, especially when describing Lake Waiorongomai and natural scenes he had witnessed over the years. He provided a lament for inclusion in this doctoral thesis.

[1004] Major shareholder of Waiorongomai 3B2.
[1005] 23-24 February 2014.

LAKE DISCOURSE

At the lake, to the West
The sun has gone to rest
The moon is rising fourth East
Dusk is preparing to spread

Blue autumn mist drifts over the lake
Clouds are drifting by like dreams
Swans are sailing like flotilla
Geese are preparing for take off

Soon they water ski back on the lake
Ducks gone to their watery nest
All is still, not a breeze
Be quiet, soon we too will rest

As a friend of Arini Loader (a whānau member) Te Atawhai Kumar was first invited to Lake Waiorongomai for a whānau planting day. She became further involved as she is employed by Te Aho Tū Roa[1006] as Poutautoko – Te Ūpoko o te Ika a Māui[1007] encouraging environmental messages in te reo Māori within kura kaupapa and kōhanga reo throughout the region. She included the Waiorongomai project in local kura events so that parents were made aware of their child/children's participation in the restoration project. This is an example of an external Māori organisation working within our community providing opportunity for expressions of kotahitanga, pūkengatanga and kaitiakitanga within the Lake Waiorongomai restoration project.

5.4 Project outcomes reflections from kaumātua and kaitiaki

The oral interviews of kaumātua and kaitiaki in this section were conducted during the Lake Waiorongomai restoration project and towards the end of the doctoral research endeavour. The seven interviewees expressed their perspectives in regards to whānau and hapū accomplishments and the expression of kaupapa tuku iho. Significant whānau and hapū involvement, supported by the wider community were fundamental in the initial positive changes to wellbeing within the Lake Waiorongomai whānau Māori ecosystem.

5.4.1 The expression of rangatiratanga and other kaupapa tuku iho during the Lake Waiorongomai restoration project – Rupene Waaka

As the initial oral interview section in this chapter (5.2) began with a kaumātua and rangatira kōrero, it is appropriate that this section starts with the oral interview of another kaumātua and rangatira that contributed significantly to the Lake Waiorongomai

[1006] A programme in te reo Māori working with kōhanga/puna reo, kura, wharekura and communities that embraces Māori culture, language and wisdom. www.teahoturoa.org.nz (& www.toimata.org.nz)
[1007] Te Aho Tū Roa Facilitator for Wellington Region.

restoration project, Rupene Waaka. His guidance, along with the guidance of others, anchored the project and steered it in a positive direction for future generations. This interview was conducted after a few years of the project, so includes reflections of rangatiratanga, ūkaipōtanga and pūkengatanga expressed by the whānau and hapū within the restoration project.

> For me ukaipō was about getting our whānau back on the land. As you know we haven't been too successful as it's been the same old same ones turning up. But I think the buzz for the beneficiaries is that they know someone is looking after their interests in the lake. Ideally we would like numbers [i.e. more people planting]. Then again, when we have worked on the land – you know we are all green horns at this. We need to focus on getting the job done. With the team we have had it's been very very successful.
>
> It's been successful in not only moving the plants from your [Aroha's] place or the Te Puna nursery to the lake, then taking four wheel drives and trailers to the planting area, dragging the plants to the locations to plant, then planting them. There has been a lot of fun. Ūkaipōtanga has seen success in those who have participated and then spread the word. Success is in the beneficiaries interests, that are being well looked after.
>
> The way I look at rangatiratanga is getting a win-win for the beneficiaries of the lake and you to get your PhD [Aroha]. We see that as a key to our rangatiratanga of giving up our taonga

for you to study. Which you are connected to, we are all connected to it. But through the Pākehā system and kāwanatanga it's been separated out, back in the day, to individual owners. So rangatiratanga today is not about ownership but the beneficiaries allowing the research to occur. As Ngāti Kapu you had a connection. Although Ngāti Kapu didn't get those rights out there, one of its sub-sets did, Ngāti Moewaka. But that too is drilled down to whānau, a sub-set hapū of Ngāti Kapu. For us it has been a win-win for everyone. We got research and the restoration project kicked off which enhances our rangatiratanga. We participated in the research, we are the products of the research and like history it will be ongoing. It is not closed. It will be ongoing like an open ended book for us. Like all journeys they are endless…

In regards to my involvement in negotiating with councils, what I have learnt over the years is that you have to build a relationship with local government. That also applies to any organisation that is exercising the principles of the Treaty – which I am actually adverse to as it should be the Treaty in it's entirety, not the principles. Ngā Hapū o Ōtaki has embarked on partnerships. We signed off with other iwi, the Wellington Regional Council and also Kāpiti Coast District Council, Memorandums of Understandings on how to interact with each other. So that's 1993 to 1995, it has been twenty years in the making to see that early work being able to line up with

> appropriate funding like the fencing, planting etc. For any funding agencies you need to set up the entity and play the game. Through those relationships and memorandums of partnerships with councils we have managed to access funding to fence off the whole lake and stream. One of the principles of Whakatupuranga Rua Mano[1008] is to leave the place in a better place than you found it. So in forging our relationships with local government, I think our generation will leave the place in a better situation as kaitiaki of Lake Waiorongomai. Not withstanding that, in having the foresight to include the children, the kura kids and Te Wānanga o Raukawa, we enhance our people… We encouraged that intergenerational knowing.[1009]

5.4.2 The expression of wairuatanga during the Lake Waiorongomai restoration project - Nellie Carkeek

The following interview was conducted with Whaea Nellie Carkeek towards the end of this doctoral research endeavour. She reflected on the involvement of her whānau in the past and present with Lake Waiorongomai. Being a spiritual person she also briefly comments on wairua aspects of the restoration project.

> Waiorongomai was an essential part of our lives. Not just mine the community. We just accepted it. It was where they all went. My father, my eldest brother, all the boys, if there was a tangi they always got their eels from there. It was a normal part of our lives. We grew up with… the talk of Waiorongomai. There

[1008] Whakatupuranga Rua Mano Generation 2000 strategy (i.e. not the kura).
[1009] Interview with Rupene Waaka, 29 November 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.

is a photo of my father and a few others taken when he was 46. We always had eels drying, raurekau. They prepared the eels like that. It was like that, going down the road to the dairy, it was essential. I can remember going out there on a horse and cart when I was quite young. I didn't actually go there much as a kid. Only at the odd times I went with my brother Wakahuia Carkeek – the one that wrote the book – he was very interested in the countryside and anything he could find. It was an adventure going out there. We never thought things would change it was just a lovely country side. Natural. Then I'm not sure what happened after that it just seemed to fade away a little.

So I was quite shocked when I saw it in recent years compared to how it used to be. It had become muddy, the flax gone, the cows eating this and that. No trees, nothing. It wasn't like that in early days. The lake and stream water was clear and flowing easily out to the sea.

I was quite pleased that my kids and moko got involved in the recent restoration. We didn't talk about it much, but they must have recognised the importance of it. I was pleased they were going out to Lake Waiorongomai and being part of the project. It reconnected my kids to the place. That is certainly what we need to do at our own place [i.e. at Rangiuru in Ōtaki].

I enjoyed seeing the landscape architecture student designs. We needed that to bring the enthusiasm back to the lake and the

> importance of the site. It was once an important source of food. I would like to see a village out at the lake for us Māori. The planting and restoration activities we are doing must have an effect of improving our wellbeing on a physical and spiritual level too. Of course it must.
>
> That association was always there with the lake for our whānau. I would like to take someone out there now to tune in.[1010]

5.4.3 The expression of kaitiakitanga during the Lake Waiorongomai restoration project - Mickey Carkeek

Kaumātua Mickey Carkeek is an active kaitiaki and natural food gatherer in this region. During his interview on 8 December 2014 about Lake Waiorongomai he shared biodiversity and kaitiakitanga memories from his childhood. Mickey has been a regular visitor to Lake Waiorongomai over his lifetime. He also commented on the present restoration activities, which in his opinion were already making a difference to the wellbeing at Lake Waiorongomai.

> As kids we grew up here playing in all the streams – the Mangapouri, the Waitohu and the Ōtaki River – they were all our playgrounds. Our eeling was out at Waiorongomai. Famed for its eels! There were eels all over Ōtaki at that time too, even out at Tasman Road. It's all spring water there but all gone today! They started covering them or digging trenches to get rid of all the water so they could farm it and market garden in it.

[1010] Interview with Nellie Carkeek, 29 November 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.

The eels were so plentiful in those days. We all grew up catching eels, playing with them and eating them! We loved eating eels. Lots of whānau had eel boxes. I used to go out a lot with my father and brothers. They would show us what to do to set the hīnaki and to go spearing or floundering. It was a beautiful time and we loved it! You followed the well-worn paths, or you got stuck in the mud and swampy ground. It was all swampy, in fact very, very swampy. The lake was right up – beautiful clean clear lake water, you could see it. You had mullet and fish that go up there. Even seals and penguins – all sorts came up the stream to the lake. You had the white heron or the kotuku visit the lake too. You used to see them on the lake's edge – all the bird life there… the bittern too… you don't see them anymore, very rare but they were there. Ducks, geese, swans – the birdlife out there was just unbelievable. There was an abundance of food there for them. The habitat was fantastic! When it would rain and rain, the water would spill over the lake's edge into the paddock. The eels would come out into the paddocks because the worms were all around the lake's edge – half a mile or more. During the summer season the water would go down but then in winter back up it would go.

One of the greatest moves I've seen is the regeneration [at Lake Waiorongomai]. All around here, nothing's happening! Yet out there it's happening! The fencing is brilliant. I been there, I've

> seen it, it's good. With the fencing in, we will in time see bird life return, the kotuku and others will come back.[1011]

5.4.4 The expression of ūkaipōtanga and other kaupapa tuku iho during the Lake Waiorongomai restoration project - Nick Albert

This sub-section on ūkaipōtanga is a reflective oral interview with whānau member Nick Albert. This oral interview held 17 November 2014 was conducted out on a sand dune within Waiorongomai Block 1A during the hīkoi to establish the proposed fence lines for the remainder of Waiorongomai Stream (Phase 2). This was the last interview conducted on site at Lake Waiorongomai due to the kōrero being only just audible above the wind, which created a poor record for the whānau and hapū. Nick Albert introduced himself first with reference to his Ngāti Maiotaki and Gilbert whānau whakapapa connections. His kōrero provides an active perspective of involvement during the restoration project and touches on the expression of kaitiakitanga, ūkaipōtanga and whanaungatanga.

> Of recent I have been absent from the land, working in the army, I came back to Wellington in recent years. I am a trustee of Waiorongomai 1A that includes the Waiorongomai Stream. The stream is an integral part of the lake. So if we are doing the restoration of the lake we need to include the restoration of the stream and whenua on this side. It connects the ocean to the lake and from the lake to the ocean. What we have been doing today is measuring and deciding the fencing for Waiorongomai

[1011] Interview with Mickey Carkeek, 8 December 2014, at Lupin Road, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.

> 1A. This is important and will fulfil our vision to protect the whole Waiorongomai Block 10 and lake for the future.
>
> The restoration project is also reconnecting our whānau. I recently brought my sister out here to see the work we have been doing.[1012]

5.4.5 The expression of pūkengatanga during the Lake Waiorongomai restoration project - Tanira Cooper

Tanira Cooper speaks about the learning opportunities for students, kaiako, kura and himself. Teaching in te reo Māori at the kura kaupapa he delved into te reo Māori and English as he described his thoughts. As a kaitiaki who has consistently visited Lake Waiorongomai over the years he has begun noticing an improvement of mauri on site. Tanira is one of Harina Cooper's sons and a mokopuna[1013] of Betty Raureti.

> The Lake Waiorongomai project... initiated our search for vocational pathways. [For example] our kids going into science strands. Because one thing those discussions done, is that it opened up our tamariki to what mātauranga Māori can do and kōrero tuku iho can do when you are wearing both pōtae. So my reflections were that our kids are not as frightened to immerse themselves in the science subjects. That is what I got out of it ultimately... The way we could compare whakaaro Māori and whakaaro science. Kaiao and pūtaiao.

[1012] Interview with Nick Albert, 17 November 2014, at Lupin Road, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.
[1013] Grandchild.

I suppose being here all your life and then coming into a job where you are responsible for facilitating pathways for kids it's amazing how much Waiorongomai is going to contribute to some of our kids pathways. In regards to those science pathways, technology, building, fencing etc. For example, after those discussions down there we have girls that have set vocational pathways that needed science in order to achieve those. So that has made Whakatupuranga Rua Mano grasp tighter to mātauranga Māori and then realise pūkenga like yourself (Aroha), how wealthy you can be, you have done that [your studies] and then can come back and obviously do what you do. And that is what it has done for kura. Vocational pathways are flying at the moment. Now the ideas are that, we want heaps of pathways because I believe that kids are so creative, they can create jobs as they learn. They see new things and... it is those little triggers that have never been ignited before. I can facilitate this for these kids.

I can see kaupapa seemlessly weaved into things - contracts, proposals, taiao raukawa, raukawatanga - promoting matāpono, the establishment of our kaupapa and this on top of it. PhDs being written for Massey through a Māori lens and Māori philosophies. Contexts and kaupapa is actually something to be excited about. And for us kaiako to be excited about.

Kura is benefiting from it right now and we haven't even got into the crux of it... I'm talking 'Ko te pae tawhiti' stuff.[1014] Ko te pae tawhiti whaia kia tata. Ko te pae tata whakamaua kia tina. So for our longterm goals we always have to work on the little things to get there and I think this is a really big part of te pae tawhiti. If I could talk about bringing it to now. When our kids finish at te kura Māori I want them to be proud of their identity and when they speak about it they can speak in two terms. So the scientists understand them and at the same time they know their people are behind them, they can feel it. You know when they speak they believe it, because it is easy to speak about Rangi and Papa but to get in the water and say I feel Rangi's tears. When I karakia and go to the river I go for a certain reason. When you believe that and feel that and are able to articulate that in both languages. Then I believe that is when knowledge is power.

For me, pae tata are taking those kaupapa whakaaro Māori. Actually, those are the little things. Taking your shoes off, taking your hat off when you do karakia, doing the dishes when you're done, picking everything up, all your things so it's like how you found it when you left it. At the end of the day those are the ringa raupa things. Attributes that epitimises mātāpono those are the qualities that we are trying to pull out of kids so by

[1014] Vocational pathways. Whāia te pae tawhiti kia tata. Whāia to pae tata kiā maua. Pursue the distant pathways of your dreams so they may become your reality. Vocational pathways website: www.youthguarantee.net.nz

the time they leave wharekura, that's when they mau pōtae – put their thinking caps on. Thats what we are trying to get right, the respect that they have for people. Once they get that respect for other people, you know. They have respect for themselves, they are able to plant their feet and learn. And when they fall over they feel good about themselves, thats just a part of it. Not just fall over and not have anything to fall back on. And that comes right back down to whanaungatanga, manaakitanga, te mea nui o te ao, he tangata, he tangata, he tangata. Whakataukī that have actually carved our way. Whakataukī, pepeha, karakia, old mōteatea that are our ways of talking about our environment. What you are doing is bringing it to the now.

Getting down to wairuatanga, ūkaipōtanga.... that's the part where mātauranga is missed because those mātua had it and I'm talking around the world there's that, I don't know what the scientific term is, there's that magic, that was there to be able to relate to. When plants are talking to plants - humans talking to plants is exactly the same. Its that vibe, the mauri, what state you are in, to be able to do it. Now that's from my heart. Now, if you feel it. If you go to Lake Waiorongomai, you feel it, then you actually know that there has been change, the water is telling you it, the eels the way they are, when they are in your net they used to be all flacid now they are still kicking strong.

> The mauri its just crazy. The mauri is flourishing at Lake Waiorongomai.[1015]

5.4.6 The expression of kotahitanga and other kaupapa tuku iho during the Lake Waiorongomai restoration project - Jessica Kereama-Stevenson

The final interview in this chapter is the voice of iwi member Jessica Kereama-Stevenson (Pūkenga Matua/Lead Academic for Te Whare Oranga: Kaitiakitanga Pūtaiao at Te Wānanga o Raukawa).[1016] Jessica spoke of the influence that the Lake Waiorongomai restoration project had on students enrolled in pūtaiao at Te Wānanga o Raukawa.[1017] She spoke of the opportunity that the Lake Waiorongomai presentation and afternoon hīkoi provided local whānau students, as well as those of other hapū and iwi from around the country. Jessica first spoke to fellow colleague Caleb Royal and myself about a presentation on the Lake Waiorongomai restoration project, but then sought approval from kaumātua Rupene Waaka. Her kōrero below includes references to whakapapa, ūkaipōtanga, whanaungatanga, pūkengatanga, kotahitanga, wairuatanga and mātauranga.

> In previous years we have gone to Greater Wellington Regional Council and Zealandia and they have talked about what they were doing around conservation which was brilliant but there were no references to our own knowing… Lake Waiorongomai in the way you presented it was beautiful because the people could see how the hapū were engaged, how they led the project, how Māori values were important… the importance of

[1015] Interview with Tanira Cooper, 27 May 2016, at Whakatupuranga Rua Mano, Ōtaki, Interviewer Aroha Spinks.
[1016] Interview with Jessica Kereama-Stevenson, 30 September 2017, at Ngā Purapura, Te Wānanga o Raukawa, Ōtaki, Interviewer Aroha Spinks.
[1017] 24 August 2017.

whanaungatanga in the project, the need to be a skilled connector across the whakapapa of those who relate to that project. In terms of our atuatanga, in terms of our knowing our creation stories, you started with how the lake was formed: the story before we arrived. Then you talked about when we arrived. Bathing in that lake in terms of rongoā, of peace, of war and so those concepts of active application of tapu and noa. That wouldn't come from other generic conservation projects. That comes from our pūkengatanga and celebration of our wairua really: 'me ōna tikanga' and all that comes with that. We need active Māori kaitiaki leading our projects that are not token: in a way that scientists and pest management people are the arms but we are the heads. I think Waiorongomai showed ūkaipōtanga in terms of foundation, knowledge, the nourishment, the basket, the connection of the people and the way you guys coordinated things was always with a Māori worldview on it. So that is what our students needed to know.

Lake Waiorongomai showed an authentic project driven by the kaumātua, kaitiaki and yourself [Aroha], it is so refreshing. The field trip cemented it. Going out on to the lake, the time we went out, the sun was setting, it looked golden. They got their hands into the whenua doing the plants. Even though we only did a few plants it was very, very meaningful. The pictures you allowed them to take helps cement memories for them. So loads of components… I think that inspired the students to know that

> they could do that in their piece… For kotahitanga we talk about 'mā pango mā whero, ka oti ai te mahi.'[1018] For pūtaiao studies we talk about connections, building platforms, sustainable relationships, and information in projects that cause transformation on the land, transformative teaching models, experiences, and so together all the different components of that mahi add up together to that wonderful learning experience for that student to be inspired by. So that's where I think Waiorongomai as a project, in terms of kotahitanga as I see it is building other hapū and iwi to have sustainable relationships, transforming the land, knowing that there are others in this space doing it, who have gone before them and so have broken the earth a little bit. That is how it contributes to that landscape. If we think about restoration along this coastline for Raukawa, every piece of work done across a wetland is part of that bioregional approach to whole landscapes being transformed.[1019]

5.5 The expression of kaupapa and tikanga as a means of transformative change

The kaupapa expressed in this chapter are appropriate at Lake Waiorongomai: rangatiratanga, wairuatanga, kaitiakitanga, ūkaipōtanga, pūkengatanga and kotahitanga. The use of te reo Māori and local tikanga are encouraged by the whānau and hapū of

[1018] English translation of this whakatauki (proverb): *With red and black the work will be complete*. This refers to co-operation where if everyone does their part, the work will be complete. The colours refer to to the traditional kowhaiwhai patterns on the inside of the meeting houses. Retrieved from: http://www.maori.cl/Proverbs.htm

[1019] Interview with Jessica Kereama-Stevenson, 30 September 2017, at Ngā Purapura, Te Wānanga o Raukawa, Ōtaki, Interviewer Aroha Spinks.

Waiorongomai. A new tikanga that was established by whānau and kaitiaki as a result of the restoration project as karakia is performed upon arrival for first visits to Lake Waiorongomai. Due to the sacredness of the site visiting this location is not encouraged without whānau approval, respect for this stance is requested. The narratives within this chapter showed that kaupapa Māori research was an appropriate methodology for the Lake Waiorongomai restoration project. The aspirations, kaupapa and tikanga of the Waiorongomai whānau, hapū and iwi members were supported and at times extended by this accompanying doctoral research endeavour.

This chapter shows that a whānau, hapū and iwi environmental restoration project led to transformative changes and knowledge development that saw improvements in the ecosystem. This included the physical and spiritual wellbeing of the land, water, surrounds and people. As expressed by the kaitiaki and kaumātua, the mauri at Lake Waiorongomai had already begun to improve. Small effects have been felt in all three fundamental realms: (i) Tua-uri (i.e. the realm of mauri); (ii) Te Aro-nui (i.e. the realm perceived by human senses); and (iii) Te Ao Tua-ātea (i.e. the realm of Io Matua Kore that is beyond the time space continuum).[1020] Whānau, hapū and iwi are willing to work collaboratively with councils and the wider community in ways that respect their rangatiratanga and tikanga. Kotahitanga evidence showed that strong positive relationships were just as important as restoration activities. Outcomes of this kind assist in making visible the cause and effect relationships between lake ecosystem and Māori community wellbeing. Because these casual relationships are culturally-mediated by the expression of kaupapa and tikanga, there really is no viable alternative to hapū-led restoration activities that naturally enhance both ecosystem and community wellbeing.

[1020] Marsden, pp. 60-62.

5.5.1 Patterns in the expression of kaupapa and tikanga

This chapter described the expressions of kaupapa and tikanga during the Lake Waiorongomai restoration project that led to transformative change, cultural survival and knowledge development. This case study also created opportunities for local whānau and hapū to develop tikanga by reclaiming, reframing and re-instating cultural customs and practices during restoration activities. Some of these have been illustrated in the following diagram (Table 5.5.1). Table 5.5.1 contains a summary list of selected expressions of kaupapa and tikanga documented in this chapter along with reclaiming, reframing and reinstating labels (column 1). The system of classification used in Table 5.5.1 provides a useful overview of the contribution that this restoration project has made towards whānau Māori cultural survival and wellbeing by: (i) reclaiming the knowing of our tūpuna; (ii) reframing the knowing of our tūpuna in a modern-day context; and (iii) reinstating the mana and wellbeing of this lake ecosystem and Māori community (i.e. Te whānau ā Ranginui rāua ko Papatūānuku).

Table 5.5.1 Examples of reclaiming, reframing and re-instating of tikanga during Lake Waiorongomai restoration project

Treatment	Rangatira -tanga	Wairua -tanga	Kaitiaki -tanga	Ūkaipō -tanga	Pūkenga -tanga	Kotahi -tanga	Manaaki -tanga	Whānaunga -tanga	Whakapapa	Te Reo
Reclaiming	Placing a tono	Karakia preceeds the fencing work	Hapū led restoration decisions & activities	Mana whenua expressed at 1st Wānanga	Pūkenga asked to officiate karakia	Wānanga apologies accepted	Hosting and catering for GWRC staff at hui	Whānau offer to help fencing activities	Whakapapa discussions	
Reclaiming	Offering a koha	Workers need protection of karakia	Restoration fences & gates protect taonga		Mātauranga shared at 1st Wānanga	Workshops at 1st Wānanga	Catering organised by Taiao Raukawa for the 1st Wānanga so all whānau could attend	Whaka-whānaunga-tanga at 1st Wānanga		
Reclaiming	Giving time for discussion	Pōwhiri for manuwhiri at wānanga[1021]			Wānanga during lake hīkoi and demos			Whānaunga-tanga discussions		
Reclaiming	Kanohi ki te kanohi	Waters from the lake no longer used by cattle to drink or bathe						Whānau attend 1st & 2nd Wānanga		
Reclaiming	Upholding the mana of hapū									
Reclaiming	Rangatira-tanga									

[1021] Welcome ceremony on the marae for guests at workshop.

	paramount									
Reclaiming	Kaumātua attend 1st Wānanga									
Reclaiming	Rangatira active at 1st Wānanga									
Reclaiming	Gates on fences locked									
Reframing	A kaitiaki team established	Attempts to use water from the lake for troughs affected by unusual events	First priority - fencing to protect the taonga	Priority for contracts given to whānau, hapū, then iwi, then associated iwi members	PhD seminar held on marae	First project Wānanga held	Hākari (1st Wānanga)	Prefer whānau and hapū are involved	Approve PhD researcher - who had whakapapa links	Student mnemonic-s for scientific terms included Māori terms
Reframing	Project authority by kaitiaki	Finding a suitable location to attach the dissolved oxygen meter	Accounting transparency 1st Wānanga		Hapū have first right of refusal for PhD project	Hīkoi to the lake	1st Wānanga externally funded	Planting 'nodes' are termed 'whānau' areas	MTM Horowhenua researchers have whakapapa links	Kaiako & students learn that some concepts of ecology align with mātau-ranga Māori

Reframing	Kaitiaki regular reporting to hapū		Aroha wānanga organiser		PhD IP vested in hapū	Whānau planting days	Row boats used to transport kuia on the return voyages during planting weekends	Deanna Rudd: "The kura are the whānau & the whānau are the kura"	Majority of contractors are approved who had whakapapa links	Te reo Māori as well as English is spoken at wānanga, hīkoi & hui
Reframing	Kaitiaki mediated meetings with trustees		Tuna returned to lake by tamariki at 1st Wānanga		Aroha recognised as PhD author	Pākehā pest control volunteer	Sharing kai after planting efforts		Fencing contractor had iwi affiliation links	Kohanga & most kura kaupapa hīkoi Te Reo Māori only used on site
Reframing	Personal approaches to trustees permitted		GPS & GIS tools used to create maps		Hapū agree to PhD Thesis being available to public & selves	Wānanga incorporate whānau, hapū, iwi and community members	Ngā Hapū o Ōtaki & Taiao Raukawa applying for funding			
Reframing	Include whānau scientists		The use of photographs, videos, drone footage		Hapū agree to one journal article	Leasee and Ngā Whenua Rāhui attend hīkoi to determine fence lines	Waitohu Streamcare nurture Waiorongo-mai seeds & seedlings			

Reframing	Rangatira to guide &sign funding applications		Four wheel drives used to transport plants & resources to planting sites		Māori & indigenous journal preferred	Row boats concept and actualising to transport plants & resources to sites during flooding	Whānau involved in eel, water, aquatic insect & fish monitoring			
Reframing	Rangatira issuing email and facebook invitations to whānau planting days and wānanga		Whānau and students reflecting on their planting efforts consider their roles as kaitiaki		Monitoring demonstrate-ions (1st Wānanga, kura hīkoi)	Work together during planting days	GWRC Biodiversity, Iwi Support, Biosecurity, Consents, Science, Policy departments & councillors & KCDC Biodiversity, Iwi Liaison support			
Reframing	Kura/Kōhan-ga whānau approached by kaiako for approval to include Waiorongom-ai Wānanga and Hīkoi		Discussions on options to address hornwort		Leasee contributes to 1st Wānanga	Roles for kaumātua and children during planting days ensure their participation				

Reframing					Restoration mentoring for Aroha from GWRC, KCDC and Ngā Whenua Rāhui	External funding for project				
Reframing					GWRC, KCDC and Ngā Whenua Rāhui train pest control volunteers	Leasees support fencing & restoration efforts				
Reframing					GWRC, KCDC and Ngā Whenua Rāhui share knowledge at Wānanga & hīkoi with whānau and students	Leasees contribute to project				
Reframing					Kaumātua and kaitiaki share knowledge and memories during oral interviews	Wānanga include whānau, kaumatua/kuia /kaitiaki kōrero, community expertise, hīkoi with practical activities onsite				

Reframing					Science use to monitor and measure species	Te Wānanga o Raukawa, Whakatupuranga Rua Mano, Te Rito, He Iti Nā Mōtai, Victoria University are involved				
Reframing					Kura students have learning opportunities in the areas of kaitiaki, science, art, fitness	Forest & Bird Society Horowhenua, Waitohu Streamcare, Wellington City Gallery, Winstones aggregates are involved				
Reframing					Student create mnemonics for scientific terms	Plant inventory volunteers				
Reframing					Students learning propagating & ongoing learning opportunities with Waitohu Streamcare Group					

Re-instating	Koroua state the children can continue to play in the mud at planting day	Mihi and waiata to tūpuna (1st Wānanga hīkoi)	Seeds are planted at 1st Wānanga	Whānau wānanga that include hīkoi to Lake	Pūkenga are asked to officiate kōiwi discoveries	Sharing of moemoea	Children were carried on (e.g. on shoulders) during hīkoi	Whānau attend planting weekends	Trans-locating harakeke from existing areas to new planting sites	Te Reo Māori shared at Wānanga, hīkoi and hui
Re-instating	Waiorongo-mai 1A Trustees inform the Māori Land Responsible Trustee of proposed fence lines	Karakia or whakarite preceeds new visitors to site	Whānau planting weekends of native trees	Whānau, hapū and iwi attending hīkoi to the lake	Filming as a form of recording 1st Wānanga	Whānau bring friends to participate in planting days	Kaumātua and children are offered transport on four wheel drives to planting sites	BBQ at the final planting day of 2014	Whānau weaver checks the whakapapa & properties of harakeke so it is known again to whānau	Te Reo Māori used by whānau during whānau planting weekends
Re-instating		Tohu	Pest and weed control measures	Whānau volunteers for planting and pest control	Kaumātua and kaitiaki share knowledge and memories at Wānanga and hīkoi			Children play in the lake and mud at planting day	Wānanga opportuniti-es for whānau to learn whakapapa links to the lake and surrounding land blocks	Te Reo Māori used during kura and kohanga during hīkoi
Re-instating		Whānau use the lake to whakanoa	Restoration activities begin to improve ecosystem wellbeing	Whānau travel long distances (as well) to go to wānanga & planting	Whānau weaver and local weaver pass on the information to whānau			The children get the mud hosed off at Aunty's house afterwards	Whānau activities provide opportunities to discuss whakapapa	Use of karakia and mihi

Re-instating		Mauri improving on site		Hapū contractor for weed control	Whānau and young people learning on site at the lake					Use of Te Reo Māori at Lake Waiorongo-mai & surrounds
Re-instating				Some first time whānau visitors						

Generalised patterns within Table 5.5.1 include the following:

(i) the re-framing of tikanga appears to have been expressed more often (73 examples) than re-instating (39 examples) and reclaiming (28 examples),

(ii) in re-framing tikanga, the kaupapa expressed most appears to have been pūkengatanga (17 examples) followed closely by kotahitanga (16 examples),

(iii) in regards to re-instating tikanga, the kaupapa expressed most appears to have been ūkaipotanga (6 examples) followed by wairuatanga (5 examples), pūkengatanga (5 examples) and Te Reo (5 examples),

(iv) in reclaiming tikanga the kaupapa expressed the most appears to have been rangatiratanga (9 examples) followed by wairuatanga (4 examples) and whanaungatanga (4 examples).

The analysis presented in Table 5.5.1 is of limited usefulness as a measure of activity intensity. For example, the expression of kaitiakitanga was prominent in the Lake Waiorongomai restoration project. Within Table 5.5.1 whānau planting days appears in one box of re-instating tikanga. However, this one kaitiakitanga example represents at least five to ten planting days a year, at least 1000 native plants each year and a considerable effort by numerous whānau, hapū, iwi, students and community members.

The main message to gain from Table 5.5.1 (and the narrative content within this chapter) is that this case study provided many opportunities to reframe, re-instate and reclaim kaupapa and tikanga. The development of distinctive Māori cultural methods (i.e. kaupapa and tikanga) was another significant output of the Lake Waiorongomai restoration project and doctoral research endeavour.

5.5.2 Patterns in the oral interviews

The initial group of interviews conducted at the beginning of the Lake Waiorongomai restoration project detailed in Section 5.2 were typical of the general historic reminiscing by kaumātua and kuia. Their memories included how very special the place was to them and their whānau, hapū and iwi. The waters were once clear and flowing. They often spoke of the catching, preparing and consuming of eels from the lake and stream. Occasionally they mentioned other fish, birds, seafood and plant life which were also abundant in their early years. Many elders recalled camping or staying in huts during summer and eeling season. Thus it is evident that local whānau frequently visited the location.

Another strong message that emerged from kaumātua and kuia during the early stages of the Lake Waiorongomai restoration project and research endeavour was regret for events that had happened in recent decades. In particular drainage, cattle in the waterways, the lack of surrounding plant foliage, the small size of eels, and the disconnection of their whānau as less and less were visiting this sacred site.

The second group of interviews conducted with kaumātua and kaitiaki during the middle to end of the Lake Waiorongomai restoration project (detailed in Section 5.4) had similar reminiscing. The elders had very positive historic memories of Lake Waiorongomai with a strong connection to place, mixed with regrets about the degradation. This group of interviews also included positive enthusiasm for recent restorative measures and whānau involvement. There were numerous optimistic messages and experiences undertaken by the whānau, hapū, iwi members, as well as the community who were involved in the Lake Waiorongomai restoration project. The few interviews presented in Section 5.4 are only a small representation of the many oral

contributions by kaumātua and kaitiaki. In summary, this second group of interviews drew attention to activities that contributed to wellbeing (e.g. fencing, pest control, planting), as well as evidence of improvement in ecological wellbeing (e.g. regeneration, eel health, ducks nesting), cultural wellbeing (e.g. use of te reo, karakia, mihi, waiata, tikanga) and social wellbeing (e.g. physical and spiritual, partnerships, learning, intergenerational).

5.5.3 Emerging synthesis

The restoration narrative within this chapter (Section 5.3) and oral interviews (Sections 5.2 and 5.4) show evidence that key kaupapa identified as important to the Lake Waiorongomai restoration project (by local whānau and hapū) were expressed throughout the restorative actions and research endeavour. The kaupapa, restorative actions and research were conducted in a kaupapa Māori approach that led to many opportunities for learning and tikanga development. The selection of examples within the themed narrative provide a record that this case study had positive effects of transformative change within the three realms: (i) Tua-uri (e.g. the eels are no longer flaccid, the 'mauri its just crazy', the 'mauri is flourishing at Lake Waiorongomai'), (ii) Te Aro-nui (e.g. fencing, whānau planting days, 'Carkeek Reunion', 'hauora hui', 'one of the greatest moves I've seen is the regeneration', the 'restoration project is also reconnecting our whānau', 'improving our wellbeing on a physical… level'), and (iii) Te Ao Tua-ātea (e.g. tohu, 'improving our wellbeing on a … spiritual level too').[1022] The kōrero and photographs presented in this chapter demonstrate initial improvements to physical, mauri and spiritual aspects of the Lake Waiorongomai ecosystem – including the surrounding ancestral landscape as well as associated whānau and hapū.

[1022] Ibid, pp. 60-62.

The Lake Waiorongomai restoration project to date has been an intergenerational effort and this will likely continue into the future.

A further positive message from this chapter is that using a culturally appropriate kaupapa Māori research approach and methods to indigenous environmental projects can be successful for the entire whānau Māori ecosystem. In this case study, lake restoration activities were a mana enhancing process that included whānau, hapū and iwi in every step of the project in accordance with their tikanga which also developed (i.e. reclaiming and reframing) as the project continued.

5.5.4 Conclusion

The Lake Waiorongomai restoration project has initiated restoration activities that were hapū-led and involved collaborative contributions by whānau, hapū, iwi and the wider community. The project achieved its goal of protecting Lake Waiorongomai with the construction of robust fences surrounding the entire Waiorongomai Block 10. Kaupapa and tikanga of whānau and hapū were expressed during the hapū-led project are captured in narratives and photographs. This evidence support the conclusion that a kaupapa Māori research methodology was appropriate for this case study.

The numerous methods used within the Lake Waiorongomai restoration project and doctoral research endeavour were employed and used simultaneously. The restoration methods, doctoral research methods and further results are expressed in the following two chapters (6 & 7). As an example, wānanga involving Kura Kaupapa students included restoration methods such as students planting native trees and witnessing pest control or fencing (Section 6.2), as well as doctoral research methods of wānanga, hīkoi, oral kōrero (e.g. kaumātua, council staff, massey staff) and ecological monitoring (Section 6.3).

It will be obvious to those in the resource and environmental planning field that a number of aspects within this chapter and case study also aligned with an action research approach. Those similarities as well as differences will be explored further in the following chapter (6). Included in Chapter 6 are tools, templates and models that were developed during the restoration project. Chapter 7 will describe the ecological monitoring methods and results.

Chapter 6 Transformative change – a reflection on the enabling role of kaupapa Māori methods, action research tools, adaptive strategies and creative artistic activities

Kia tupu, kia hanga, kia whai mata.

To grow, to shape, to give it a profile.

This chapter provides an overview of the kaupapa Māori methods, action research tools, adaptive strategies and creative artistic activities used in the Lake Waiorongomai restoration project to enable transformative change. Thus, this chapter may be thought of as a contribution to research method (cf. tikanga) and the creation of best practice guidelines. As such, this chapter will be of interest to other hapū[1023], iwi[1024] and researchers seeking to achieve on-the-ground environmental restoration aspirations in accordance with local kaupapa[1025] and tikanga[1026]. Finally, this chapter provides a reflection on the kaupapa Māori research approach used and describes how it aligns with current theory and practice in action research. This reflection is provided because action research is a more commonly used methodological approach in resource and environmental planning, even though clearly it can be limited in a cross-cultural problem context of this kind. This point is made because the Lake Waiorongomai

[1023] Sub-tribe, clan.
[1024] Tribe, nation.
[1025] Values, strategy, purpose.
[1026] Customs, obligations.

restoration project was finally achieved, after initial attempts to restore this lake ecosystem failed. Movement from 'failure' to 'success' was made possible by the use of transformative method. Thus, this chapter plays an important role in this thesis in clarifying the enabling role of kaupapa Māori methods, action research tools, adaptive strategies and creative artistic activities in transformative change. It shows that culturally-mediated methods based on the expression of Māori cultural values (kaupapa tuku iho[1027]) played a central role in enabling transformative change. Further, it seems unlikely that this transformative outcome would have been accomplished by the use of action research method and adaptive management practice.

The socially and culturally-mediated Lake Waiorongomai restoration project was complex and for this reason the methods and results emerged through an adaptive process. This process has similarities with what is described in the western science literature as 'adaptive management'. However, this project required a complex socially and culturally-mediated model of adaptive change that is kaupapa-based and thus transcends the English notion of 'management'.

Because this chapter documents kaupapa Māori (research) contributions to transformative change, it is important to provide some initial context and explanation as to why this chapter is written by using what might be referred to as an unconventional (academic) writing approach. In order to avoid confusion for non-Māori readers, it is also helpful to provide a written guide as to how the contents of this chapter might be interpreted as a contribution to kaupapa Māori research. This last point is especially important because this thesis is not written in te reo Māori as English is my first language. While English can be used to communicate kaupapa Māori, it is incomplete and can contribute to misinterpretation of important ideas. One way of avoiding

[1027] Values passed down from our ancestors.

misinterpretation is to provide adequate written context to help readers to interpret what follows.

6.0.1 Writing style that combines method, results and narrative

Chapters 5, 6 and 7 of this thesis are written in a way that combines elaboration of method (kawa[1028], kaupapa and tikanga), results (outcomes) and collective narrative. This approach stands in contrast to a western science thesis in which theory, method, results, discussion of results and conclusions are typically presented in this sequence. The reason for a different approach employed in this thesis may be explained as follows. In a kaupapa Māori research approach, it is appropriate to narrate results in the first person because 'results' are the expression of culturally defined human values. By contrast, western science often utilises a passive voice, in an attempt to express objectivity, thus avoiding (or concealing) bias caused by the value preferences of the researcher and those who participate in the research process. To illustrate the essential differences in western scientific and indigenous methodologies, Figure 6.0.1 shows that Māori knowledge development is based on the expression of culturally defined human values, using indigenous transdisciplinarity as a basis for transformative change.

[1028] Protocol.

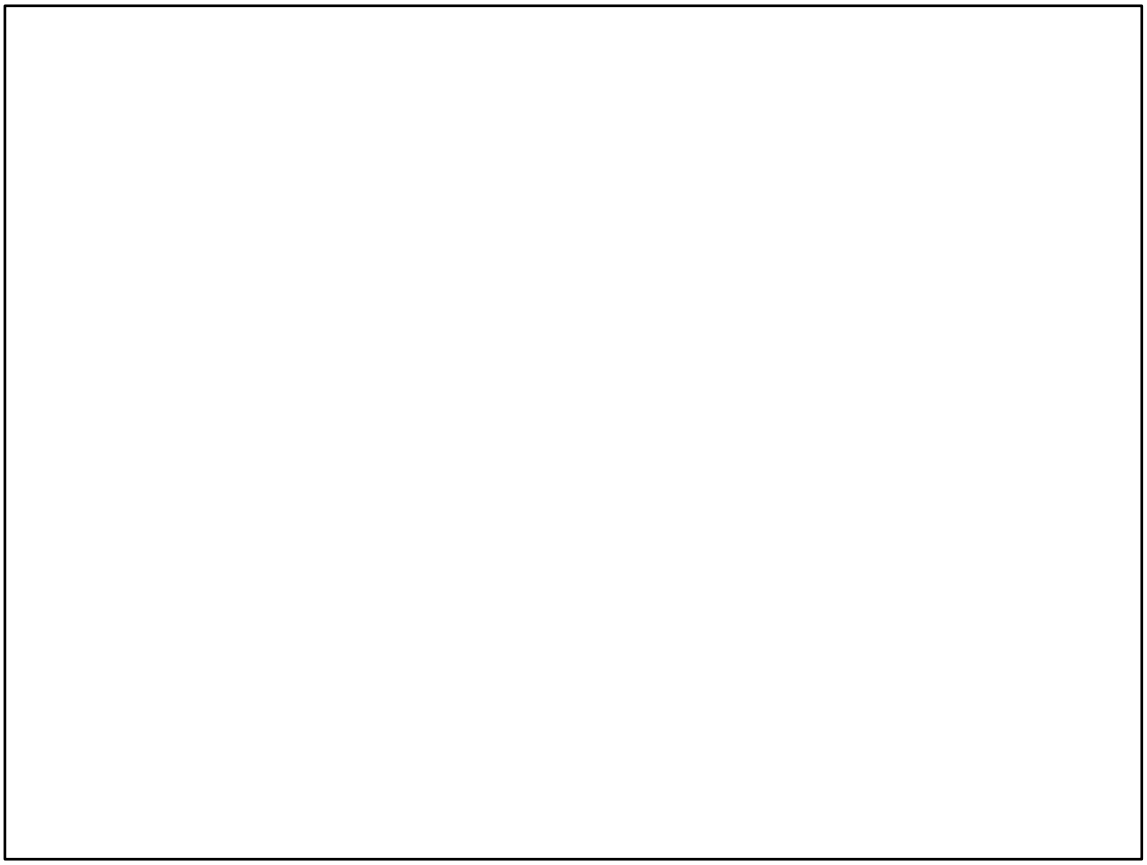


Figure 6.0.1 Analysis, synthesis and values based knowledge development *(Source: Cole, A., 2017, p. 132)*

Within Chapters 5 and 6 of this thesis it was culturally appropriate not to separate 'method' from results. Instead, results are described and discussed using first person narrative in a way that links these community activity outcomes to method (i.e. the expression of Māori cultural values). This is the essence of kaupapa Māori research. New knowledge (mātauranga, māramatanga, mōhiotanga), methods (tikanga) and narratives (pakiwaitara, pūrākau) are often co-created by whānau[1029] and hapū as part of daily activities that express Māori cultural values (kawa, kaupapa, tikanga). In summary, Chapter 6 makes a contribution to method, results and the co-creation of narrative in a way that aims to help other iwi and researchers to activate transformative

[1029] Family, extended family.

change in ecosystems (which includes people[1030]) in a mana enhancing way (i.e. through the expression of Māori cultural values).[1031]

6.0.2 The important distinction between research project and researcher

In western scientific approaches, a doctoral student typically maintains a clear line of distinction between (i) themselves as 'researcher' and (ii) the experimental or socially-mediated process which they use as a basis for creating new learning. In kaupapa Māori research this line of distinction is less distinct. This point is important because Chapter 5 of this thesis focused attention on community expressions of kaupapa and tikanga. By contrast, this chapter (6) focuses attention on my involvement in this research project as a whakapapa-based member of a Māori community (i.e. that includes my hapū). This kaupapa Māori research project was an expression of whanaungatanga[1032] and my genealogical relationship with this Māori community was a critical deciding factor that made it possible for me to take on a research role. There is a very real sense in which I am 'just' a whānau member in this project that has the same privileges as other whānau members. However, as a kaupapa Māori researcher, I had additional responsibilities.

The main responsibility focuses on my ability to express manaakitanga[1033] towards my whānau and hapū. Next to whakapapa[1034], manaakitanga is one of the most important attributes of a kaupapa Māori researcher. My responsibilities in this project included drawing on my understanding of Te Ao Māori[1035], my education and previous career experiences to help facilitate this whānau Māori ecosystem restoration project. Use of

[1030] Described in Chapter 2.
[1031] Note: Chapter 7 describes the ecological monitoring methods and results within the same chapter. Given that the material presented in Chapter 7 is based primarily on ecological methods, in contrast to Chapters 5 and 6 it uses a passive voice typical of western science.
[1032] Kin ships, family relationships.
[1033] Generosity.
[1034] Genealogy.
[1035] Māori worldview.

expressions such as ‘facilitator’ or ‘project manager’ approximates a job role that is not easy to capture in English words. A more appropriate Māori word would be ‘kotahitanga’[1036]. My responsibility in this project was to give expression to kaupapa and tikanga in such a way that whānau and hapū members were able to work together as one[1037].

In my role as a kaupapa Māori researcher is was not for me to decide what the best research method would be for the successful completion of this project. Whānau, hapū and kaitiaki choose methods that were consistent with their inherited Māori cultural values (i.e. kaupapa and tikanga). Thus, it would be incorrect to describe or interpret procedures and methods we used as an attempt to uncover new ‘scientific’ methods or processes that should be followed in order to achieve transformative change in a project of this kind. The methods were ways in which we could give expression to our cultural values. In this context, a stepwise procedure means nothing if it is not a heartfelt expression of kawa, kaupapa and tikanga. This is important for the correct interpretation of this present chapter.

The key message of Chapter 5 and 6 of this thesis is that it was the expression of Māori cultural values that enabled transformative change in this six year project. A point I return to later in this chapter is that action research (by contrast) focuses attention on correct method (i.e. theoretically sound, stepwise procedure) as an essential basis for transformative change. Action research is thus limited in a cross-cultural, indigenous problem context of this kind because it attempts to provide an ‘objective’ and ‘value-free’ framework in which communities/stakeholders can express their values. This chapter leads to the inescapable conclusion that action research methods would not have

[1036] Unity, togetherness, collective action.
[1037] Tahi.

produced or achieved a similar amount of transformative change in this degraded whānau Māori ecosystem problem context.

My role as a kaupapa Māori researcher in this project did not mean that it was my primary job to create new knowledge or method. In kaupapa Māori research, new knowledge is co-created by a Māori community. For this reason, the writing of this doctoral thesis should not be considered as a 'writing project on the side' that I created. This doctoral thesis represents the co-construction of a narrative that belongs (and is dedicated to) my whānau and hapū. It would not be culturally appropriate for me to try and create a publication in isolation from my whānau and hapū. This would diminish their mana and my own. However, I have had the responsibility to 'facilitate' this co-construction process. While it was my responsibility to write the words of this thesis, it was also my responsibility to ensure that what is written provides a true and accurate record of this transformative experience. Whānau members provided guidance as I progressed with my writing and the kaitiaki team peer reviewed the chapters within this thesis.

6.0.3 The significance of a kaupapa Māori researcher

A further conclusion drawn from this chapter is that transformative change of the type produced in this project would not have been possible with any researcher except a kaupapa Māori researcher. This point was not so clearly seen at the outset of this project, however, in reflection there are a number of reasons why the contributions made by a kaupapa Māori researcher are essential to transformative change. This thinking is significant as a contribution to those who seek to create future projects of this kind.

First, there are very practical reasons why the role of a kaupapa Māori researcher who is able to work as a whānau member of a Māori community and 'on-the-ground' is important. In western management terms, a project of this kind involves an enormous effort in the areas of relationship building, communication, record keeping, consistently meeting, obligations and organisation. Relationships, reciprocity, responsibility and generosity are foundation pillars of a project of this kind in a Māori community. Throughout these various expressions of kaupapa and tikanga, the kaupapa Māori researcher is able to nurture and support the collective expression of kotahitanga (i.e. unified, collective, transformative action). This should be considered as a wairua (sacred) responsibility.

Second, in modern-day context the members of a Māori community are generally pre-occupied with the responsibilities of earning a living to support their whānau. My involvement in this project as a doctoral candidate (i.e. kaupapa Māori researcher) meant that I could use my part-time doctoral scholarship[1038] from the Manaaki Taha Moana research programme (2011-2015) to cover the basic needs of my whānau so that I was free to commit myself to work fulltime on this project. This meant that at least one member of our Māori community was available to attend meetings, organise contractors and resources, write funding applications, communicate, reciprocate, ensure obligations were met, keep records etc. These duties may seem insignificant in western scientific research terms, however they are essential contributions that assist in maintaining the integrity of a project of this kind, especially in the 'eyes' of funding organisations and accountability to hapū.

Finally, in 2015 when my doctoral scholarship monies came to an end, it was necessary to attempt the writing of this thesis while working part time in order to cover the needs

[1038] 0.2 FTE (Full Time Equivalent = 2 days of paid employment)

of my whānau. This meant that previous progress on the lake restoration project was more difficult to sustain. This point does not diminish the importance of writing this thesis or its role in this project as a whole. However, there is an economic reality associated with sustaining a project of this kind that needs to be carefully considered when initiating community led environmental projects.

6.0.4 Organisation of the information in this chapter

Section 6.1 describes how action research tools and creative artistic activities were used in the Lake Waiorongomai restoration project and Manaaki Taha Moana (MTM) research programme.[1039] This written description is provided in the hope that these approaches may inspire and assist other iwi, hapū, whānau and researchers who are involved in environmental restoration endeavours.

Methods used in the Lake Waiorongomai restoration project and doctoral research endeavour were mentioned in Chapter 5, and are described here in greater detail. For the sake of clarity, restoration methods (6.2) and research methods (6.3) are described in separate sub-sections, although notably they were inextricably linked.

Reflective tools were utilised within the restoration project and doctoral research endeavour these were detailed along with the theoretical interpretation of their use in Section 6.4. It is envisaged that these may be used as best practice guidelines and adapted further by iwi, hapū, whānau researchers, as well as other community organisations involved in environmental restoration projects.

The final section (6.5) of this chapter reflects on the aspects of this hapū-led restoration project that used a kaupapa Māori research methodology to compare and contrast with

[1039] The Lake Waiorongomai restoration project is a local hapū-led case study that initially gained momentum from the support of the Manaaki Taha Moana research programme. Described in Chapter 1, Sub-section 1.2. Also refer to www.mtm.ac.nz

action research. This reflection provides a cultural contribution to the action research discipline and field of resource and environmental planning literature.

6.1 Action research tools used in the Lake Waiorongomai restoration project and doctoral research endeavour

The desire for a restoration project at Lake Waiorongomai had been extensively discussed and various options researched by whānau and hapū along with external advice prior to this doctoral research project.[1040] The Manaaki Taha Moana (MTM) research programme provided an opportunity for the whānau and hapū to be supported by their iwi environmental trust, Te Reo a Taiao Raukawa ki te Tonga (Taiao Raukawa). As an MTM researcher, I was asked by Te Waari Carkeek to collate existing hapū plans and meeting notes into a report for GWRC for which they had previously received funding. This report included (i) advice from kaumātua[1041], local councils and the Department of Conservation as well as (ii) a written description of the shared vision of local whānau and hapū.[1042]

In 1993, the Department of Conservation had created a draft discussion paper named '*Korero Whiriwhiri mo Te Oranga o Waiorongomai: Conservation Management of the Waiorongomai Wetlands'*. In the draft, issues (i.e. nga take) were identified as:

- Lake level
- Water quality
- Wildlife and fish habitat
- Neighbour impacts
- Protection

[1040] Described in Sub-section 3.1.3.
[1041] Elders.
[1042] Te Rūnanga o Raukawa Inc., 2011. (unpublished report)

- Tikanga[1043]

As Rupene Waaka later commented "this was the genesis but unfortunately with no funds it therefore floundered."[1044] The draft document proposed that the goal was:

> to revitalise the mauri of Waiorongomai: Hei whakaoho te mauri.[1045]

A further objective involved enhancing:

> the conservation values which are the cultural, spiritual, natural, educational and community potentials of the resource: tikanga a nga tipuna [and] through tikanga provide cultural and harvest outcomes: mahi a nga tupuna.[1046]

This conservation vision that was first articulated in 1993 took another twenty years before active restoration measures started with the fencing in January 2014. Getting this complex lake restoration project started was finally made possible by the use of the following socially and culturally-mediated methods.

6.1.1 Clear communication

Clear communication is essential in any project that is working towards goals. When working with Māori communities in the area of environmental research and resource management, "consultation rather than confrontation is a key" according to Huhana Mihinui.[1047] A successful tono[1048] to the whānau, hapū and Waiorongomai 10 Trust

[1043] Department of Conservation, 1993, p. 2.
[1044] R. Waaka, 31 March 2016, personal communication.
[1045] Department of Conservation, 1993, p. 1.
[1046] Ibid.
[1047] Mihinui, H., 2002, Consultation rather than confrontation is a key, p. 32.

chairperson cemented my involvement to support the restoration aspirations whilst conducting this doctoral research. Within this collaborative project, as author and iwi researcher I accepted a central responsibility to communicate with the contributors to the lake restoration. The whānau and hapū established a kaitiaki team for me to liaise with directly on a day to day basis, which was also a key ingredient to the success of actions within the restoration project and doctoral research endeavour. Notably other aspects of communication were the responsibility of the hapū. The following sociogram illustrates the communication pathway used in this project (Figure 6.1.1).

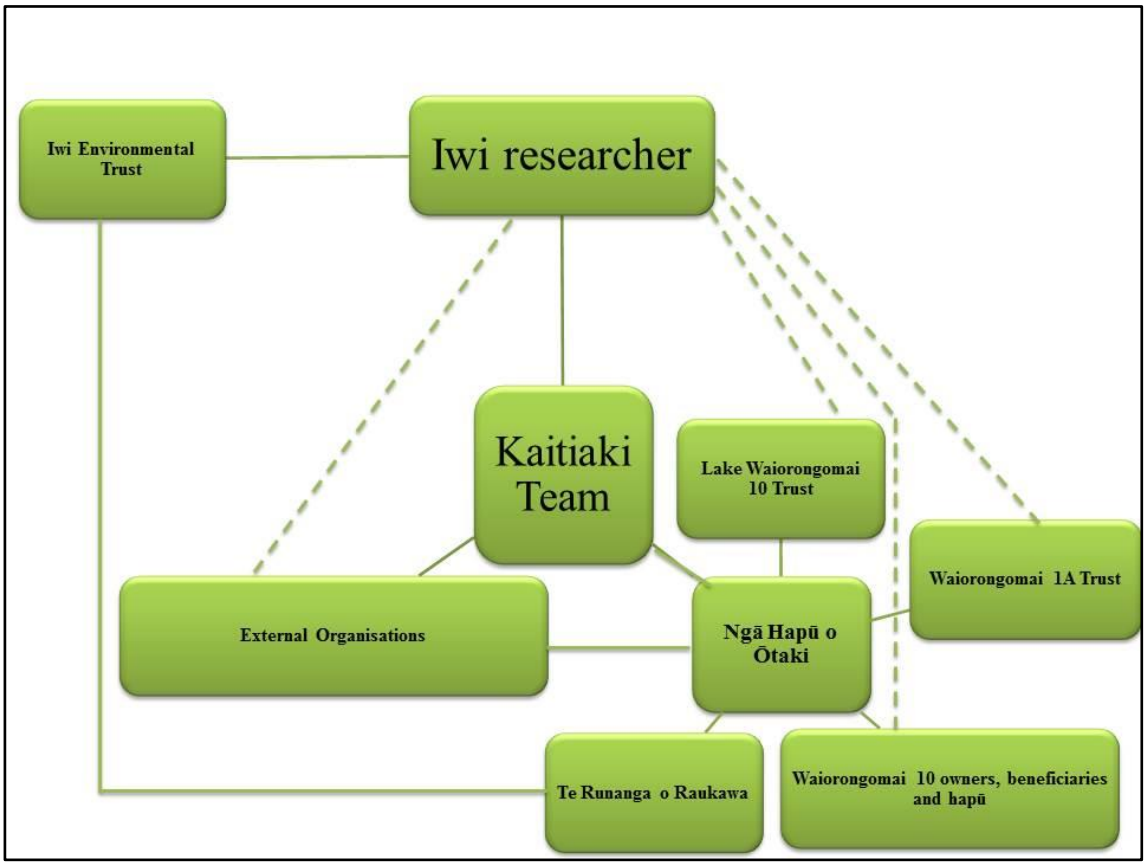


Figure 6.1.1 Communication sociogram for Lake Waiorongomai restoration project

These communication pathways were set up from the beginning of the restoration project. The hapū elected kaitiaki team members were essential to my supportive role

[1048] Request, bid.

in guiding the day-to-day planning and restorative measures. Kaitiaki team members had authority to make decisions or recommended when to take suggestions to the hapū or trustees for approval - as they deemed necessary. The solid line in the Figure 6.1.1 indicates two way communication that occurred throughout the project. The dash lines of communication in Figure 6.1.1 indicate the growth in my relationship with the kaitiaki team members and whānau. Direct communication was approved by the kaitiaki team as I gained their confidence to know and understand the whānau and hapū environmental aspirations, kaupapa, tikanga and my limitations to not step beyond my supportive role.

This communication arrangement can be illustrated by the management options considered by whānau and hapū regarding the threat of the aquatic weed hornwort (*Ceratophyllum demersum*). This invasive weed was discovered in the lake during the ecological eel monitoring. Kaitiaki requested that I collate relevant research reports on the management options and other iwi experiences that could be used to provide a presentation at the second LWRP Wānanga[1049].[1050] This was to ensure that the whānau and hapū were: (i) able to make an informed decision; (ii) involved in the decision-making; and (iii) that as many members as possible were made aware of the management option chosen. This practice ensured the mana and rangatiratanga[1051] of the hapū was respected and it also provided protection for me. This topic was particularly important as one of the management options included the potential of introducing exotic grass carp (*Ctenopharyngodon idella*) into the lake.

[1049] Learning, workshop, seminar.
[1050] 13 June 2015.
[1051] Sovereignty.

6.1.2 Applications for funding

As discussed earlier (Sub-section 5.3.1) the environmental research funding sector in New Zealand is complex, competitive and oversubscribed. Clear, precise and relevant information must be included in all applications for funding in order for them to be successful. Ensuring the research project proposal meets the funding criteria while aligning with whānau/hapū/iwi aspirations and kaupapa is critical to funding application success. This outcome can best be achieved by investing sufficient time in face to face dialogue and the expression of manaakitanga at the start of the project (including planning) as well as throughout the project. Yet this culturally appropriate approach creates strong positive whanaungatanga and whakapapa connections that are crucial to the overall success of any hapū/iwi environmental project.

In the case of Lake Waiorongomai it was important to ensure careful planning included in-depth discussions with kaitiaki team members in the drafting of funding applications. Kaitiaki, kaumātua and/or trustees approved final funding applications for submission. Appendix 4 contains an example of one of the successful funding applications that was crucial to instigate the initial active restoration measures at Lake Waiorongomai. This application to GRWC Iwi Projects fund was, at the time it was made, open for interpretation. Other successful funding applications for Lake Waiorongomai included:

- KCDC Heritage Funding
- KCDC Riparian Funding
- The Department of Conservation Bioadvice Funding
- GWRC biodiversity department funding
- GWRC pest control sponsored traps
- GWRC land management department funding

6.1.3 Action and resource planning tools for the Lake Waiorongomai restoration project and doctoral research endeavour

Sound planning is essential for any project to ensure that project goals and objectives are timely, measurable, achievable and successful. Drawing on project management experiences from my work in the seafood industry in past years, I developed action, ecological monitoring and monitoring resource plans for Lake Waiorongomai. Selected sections of the LWRP Action Plan and LWRP Ecological Monitoring Plan as work in progress documents are provided as examples in Appendix 5 and Appendix 6 - respectively. The LWRP Monitoring Resource Plan which was also developed in the planning stage of the project is provided in Appendix 7. These plans may be used and adapted easily to other restoration projects.

These planning documents were beneficial as communication aids for hapū, kaitiaki, funders, my PhD supervisors and other interested parties. They are easily adaptable, and regular updating was essential to ensure efficient records and accounting for new plan additions. Saving the newly changed documents with the latest date in the file name helps to maintain the use of the most recently saved edition. As an example the title 'LWAP_020214' represents the 'Lake Waiorongomai Action Plan 2 February 2014'.

In the Lake Waiorongomai case study, as detailed in Chapter 3 (Sub-section 3.1) the lake and stream are included in one land block (i.e. Waiorongomai Block 10 Lake). Waiorongomai Block 10 was set aside by the whānau and hapū as a Māori Reserve in 2003.[1052] During the planning stage of the first LWRP Wānanga kaitiaki team member Rupene Waaka requested that I research and report back on the Te Ture Whenua Act 1993 requirements to notify the Trustees of the intention to hīkoi with beneficiaries on

[1052] New Zealand Gazzette, 3 April 2003, p. 913.

the block. This was done and a summary document produced (Appendix 8) for the whānau and hapū to use on any other land blocks that are designated as Māori Reservations under the Act.

Restoration projects usually require native plants that are preferably eco-sourced. In the Lake Waiorongomai project native plants had to be ordered a year in advance from a reputable nursery. To purchase these plants, funding applications were made each year to the KCDC Heritage Fund. These applications required a Heritage Plan for Lake Waiorongomai. To achieve the LWRP Heritage Plan I extracted relevant parts from the GWRC Iwi Projects application (Appendix 4). As a requirement of this fund a memorandum of understanding (MoU) was created around important factors such as: (i) only using local eco-sourced native plants from the Foxton ecological district; and (ii) retiring the agreed area (MoU in Appendix 9).

Planting plans were created in discussion with KCDC Biodiversity Officer Rob Cross, who advised on appropriate local wetland and dune native tree species. Using the GWRC mapping program available online, Figure 6.1.2 shows an example of a map-based planting plan that was created a year in advance to accommodate the lead time need to order native plants. One thousand native plants were ordered, with species determined by landscape location, and advice given by Rob. In the planting plan shown in Figure 6.1.2, wetland species that are capable of spending long periods in winter with the roots waterlogged were ordered for August. Dune plant species that favour free-draining root conditions were ordered for July, September and October plantings. Plants were ordered from Kāpiti Nursery[1053] and Taupo Nursery[1054]. In my supportive

[1053] Kapiti Nursery and Landscaping Ltd. (www.kapitinursery.co.nz)
[1054] www.tauponativeplant.co.nz

role, it was important at the end of summer to check that additional planting gear such as protectors, stakes, mats and fertiliser tablets were well in stock (at least 1000 units).

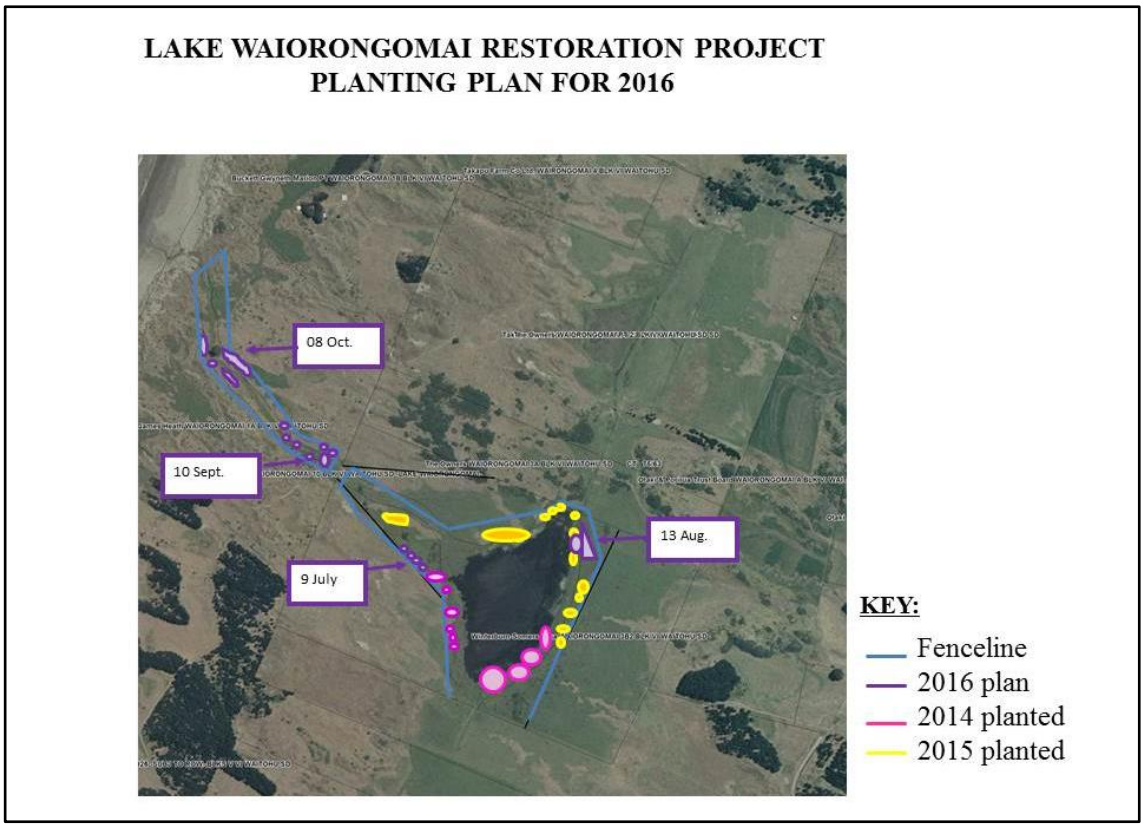


Figure 6.1.2 Planting plan for 2016 (*Source: Aroha Spinks created 2 August 2015*)

Figure 6.1.2 was used for whānau planting days in 2016. The spatial planting strategy provided the whānau with plenty of advance warning of potential dates they may wish to attend. Rupene Waaka took on the pivotal role of creating the invitations and started the circulation to whānau via emails. Donovan Joyce placed invitations on the Maiotaki facebook page and we also used 'word of mouth' by whānau members.

Below is a checklist created for the restoration project in preparation for whānau planting days (Table 6.1.1). In advance of a planting day much preparatory work was needed such as: coordinating delivery of suitable plants for each location on the morning of the planting event; a four wheel drive vehicle with a tow bar and trailer;

booking at least one back-up four wheel drive vehicle; informing the leasee/s in advance of planting days; and sending reminders to encourage whānau to attend.

Table 6.1.1 Whānau planting day checklist

Item	#	**Tick √**
Keys to gates	5	
Plant protectors	250	
Warm woollen matts	200	
Fertiliser tablets	250	
Plastic Rubbish Bags	5	
Camera	1	
Pocket knife	1	
Shovel	5	
Gumboots	1 pair	
Jacket	1	
Gloves	10 pair	
First Aid Kit	Medium	
Mobile phone	1	
Drink bottle & water	1	
Lunch/Afternoon tea	1	
Tow rope	1	
Keys for padlocks on the boats	1-2	
Oars	2	
Life jackets	3	

Running wānanga and workshops is quite common on our Ngāti Raukawa ki te Tonga marae. For our wānanga, the following budget template shown in Table 6.1.2 was useful. An aim of the MTM research programme in the Horowhenua was to ensure that wānanga were well resourced and catered for as an expression of our manaakitanga (see Chapter 5, Section 5.3.1).[1055] One recommendation to environmental planners, policy makers, funders, researchers, scientists and iwi is to adequately resource engagement with whānau, hapū and iwi as it is crucial in active environmental projects. MTM provided for at least a koha[1056] of $500 in wānanga budgets for the marae. This was over and above the venue hire costs, and koha to kitchen hands. For the first LWRP

[1055] He mihi atu to Moira Poutama for the delicious kai and all those kaimahi who assisted in the kitchens.
[1056] Gift.

Wānanga that received Department of Conservation Bioadvice Funding, the funding application budget included an allowance of koha for presenters. This tikanga was approved and supported by the funding agency.

Table 6.1.2 Wānanga budget template example

Expense	Budget $	Spent to date	Remainder	Details of expense
Venue Hire	500	500	0	Whare kai and wharenui hire
Marae Koha	500	500	0	Koha at powhiri
Catering	1000	875	125	(e.g. $5/head per person morning tea, $15/head per person lunch, $5k/head +GST)
Van Hire	150	150	0	Use of iwi marae van $150 koha per day
Project Hire	50	50	0	Use of projector & screen $50 koha per day
Presenters koha	300	250	50	Koha for travel & time
Participants koha	300	300	0	Koha for travel & time
Stationery	200	150	50	Stationary (Whiteboard markers, A3 worksheets, pens, vivids etc)
TOTAL	**3000**	**2775**	**225**	

6.1.4 The enabling role of creative artistic activities that inspired

Using visual methods that incorporate mātauranga Māori as an enabler of transformative change contributed to the retention of our Māori cultural identity and ensured the satisfaction the whānau and hapū of Waiorongomai.[1057] Along with oral traditions of sharing knowledge, visual methods such as whakairo[1058], rāranga[1059], ta moko[1060] were used by Māori historically.[1061] An aim of the MTM research programme

[1057] Main audiences for this doctoral thesis are described in detail in Chapter 4 (Sub-section 4.1.5).
[1058] Carving.
[1059] Weaving.
[1060] Tattoo, carving of the skin.
[1061] Ford, J., 1992, A brief essay on the history of Maori art in New Zealand, pp. 4-6; Mead, H., 2016, Tikanga Māori: Living by Māori values, pp. 269-284; Smith, H., 2011, E tū ake: Māori standing strong, pp. 11-19, 46-91, 122-143.

in Horowhenua was to use creative artistic activities to inspire and generate interest among the hapū and whānau involved in the local restorative case studies.[1062]

When the Lake Waiorongomai restoration project initiative began, MTM Horowhenua researchers had whānaunga connections[1063] who introduced them to the Landscape Architecture staff at Victoria University in Wellington (in particular to Professor Penny Allan and husband Professor Martin Bryant). Following this introduction, the fourth year Masters students' in Landscape Architecture at Victoria University were engaged to design visual, future-inspiring, potential ideas for the range of MTM Horowhenua case studies.

The organising team for this creative artistic activity consisted of MTM researchers and Victoria University Landscape Architecture staff who worked together to identify and decide on wānanga agenda and methods that could be used to develop 'cultural appreciation' and facilitate knowledge transfer to the students. The concepts, tools and methods used during the MTM Landscape Architecture wānanga were based on traditional Māori cultural practices. Three methods were used: (i) Waharoa – welcome to the marae; (ii) Hīkoi - walking and talking on the whenua; and (iii) Whakapapa – the Māori genealogical system that makes sense of a complex world.[1064] Wānanga and these three cultural practices eventually became incorporated into a bi-cultural design-studio framework. The design studio was bi-cultural and action-based, and helped to facilitate cross-cultural knowledge development at this cross-cultural interface. Penny Allan and Huhana Smith wrote a MAI journal article specifically dedicated to the

[1062] Chapter 1 (Section 1).
[1063] Paul Ransfield, Ngāti Tukorehe, Ngāti Raukawa ki te Tonga.
[1064] Allan & Smith, 2013, p. 144.

outcomes and experiences of these MTM Landscape Architecture bi-cultural studio wānanga.[1065]

The Landscape Architecture students actively participated in annual wānanga where they were immersed in tikanga marae and mātauranga for varying periods of time. Each MTM landscape architecture Wānanga started with a pōwhiri[1066]. Students were then divided into case study groups (including Lake Waiorongomai)[1067] by the Victoria University staff. Each morning of the wānanga, local kaumātua, kaitiaki and other external experts related their perspective and guidance to students. These oral kōrero[1068] provided opportunities for students to listen to indigenous knowledge relating to the ancestral landscape. During these sessions, students heard the environmental concerns and aspirations of hapū and kaitiaki members. After a delicious lunch prepared at the marae by Moira Poutama, students visited each case study site. Using the hīkoi methodology, each afternoon they walked a different case study site (for example, a Lake Waiorongomai hīkoi, Figure 6.1.3). Students were invited (and inspired) to start sketching designs on site, photograph the landscape and discuss opportunities and ideas with hapū participants. In addition to scholarly research and creative artistic activities, students were given opportunities to ground themselves in practical daily realities such as: learning to set up the whare tūpuna[1069]; setting and clearing tables in the whare kai[1070]; and generally cleaning up after themselves. The week-long wānanga were enjoyed by the students, as they engaged in active learning,

[1065] Allan & Smith, 2013.
[1066] Welcome ceremony at marae.
[1067] The case studies for these wānanga were: (1) Waiwiri Stream from Lake to Sea; (2) Ōhau River Loop; (3) Kuku Ōhau Estuary Enhancement; (4) Ransfield's Wetland Kawenata; (5) Lake Waiorongomai Restoration Project (refer to Figure 1.2.2 for locations).
[1068] Speak, narrative.
[1069] Meeting house.
[1070] Dining room.

while immersed in Māori tikanga and kaupapa to inspire their designs. Many commented on the new unity and friendships amongst the groups.

Figure 6.1.3 Landscape Architecture students on hīkoi to Lake Waiorongomai 2013 *(Source: Photographs by Huhana Smith and Aroha Spinks, 14 March 2013)*

The landscape architecture designs were presented back to the hapū and local community. Using this bi-cultural design studio, the Waiorongomai whānau and hapū received many inspirational designs over the years that included; rongoā[1071] gardens, bird sanctuaries, viewing platforms, glow in the dark pou[1072] lighting up pathways at night, singing concert arenas and a pito[1073] idea to name just a few. A small selection of Lake Waiorongomai designs appear in Figure 6.1.4. There were many more stunning

[1071] Medicine.
[1072] Large carved posts.
[1073] Referring to one idea around a site dedicated to burying infants' whenua (afterbirth).

designs and accompanying taonga.[1074] Whānau and hapū were invited to attend exhibitions of all the students designs' held at Victoria University in Wellington. Nellie Carkeek and Te Waari Carkeek attended on behalf of local whānau and hapū. Due to low whānau attendance and the distance to Wellington the decision was made to bring the designs back to the local Kāpiti-Horowhenua community.

Figure 6.1.4 Lake Waiorongomai Landscape Architecture Designs 2012 on display at Victoria University in Wellington, students and my son Kiinui *(Source: Photograph by Aroha Spinks, 20 June 2012)*

The exhibits held at local libraries and hui were well received by hapū and the wider community (Figure 6.1.5). I coordinated the Ōtaki Library exhibitions with the help of

[1074] For example: a small replica of notched posts that when viewed at a particular angle portrayed a wheku (face design); and a wooden case with the geomorphology surrounding Lake Waiorongomai carved into the lid.

Iwi Liaison staff at the Ōtaki Public Library[1075] (Kristie Parata in 2012, and Maia Whiterod in 2014). Huhana Smith, Penny Allan and masters students helped set up displays for the Ōtaki library project. Moira Poutama coordinated with Te Takere (Te Takeretanga o Kura-hau-pō: Horowhenua Culture and Community Centre)[1076] in Levin for the 2013 exhibition, where the projects were hung by Huhana Smith and students. The students gave their free time to attend, set up and take down the exhibitions. Once again, I extend a mihi[1077] to these dedicated students on behalf of the Ōtaki community.

Figure 6.1.5 Landscape architecture designs on display along with the designers at Ōtaki Library, 2014 *(Source: Photograph taken by Aroha Spinks, 18 August 2014)*

The landscape architecture designs provided an opportunity for the knowledge of kaitiaki and specialist external experts to be incorporated into students' creative visual

[1075] http://www.kapiticoast.govt.nz/libraries/my-library/about-the-library/locations--opening-hours/
[1076] www.tetakere.org.nz
[1077] Acknowledge, thank.

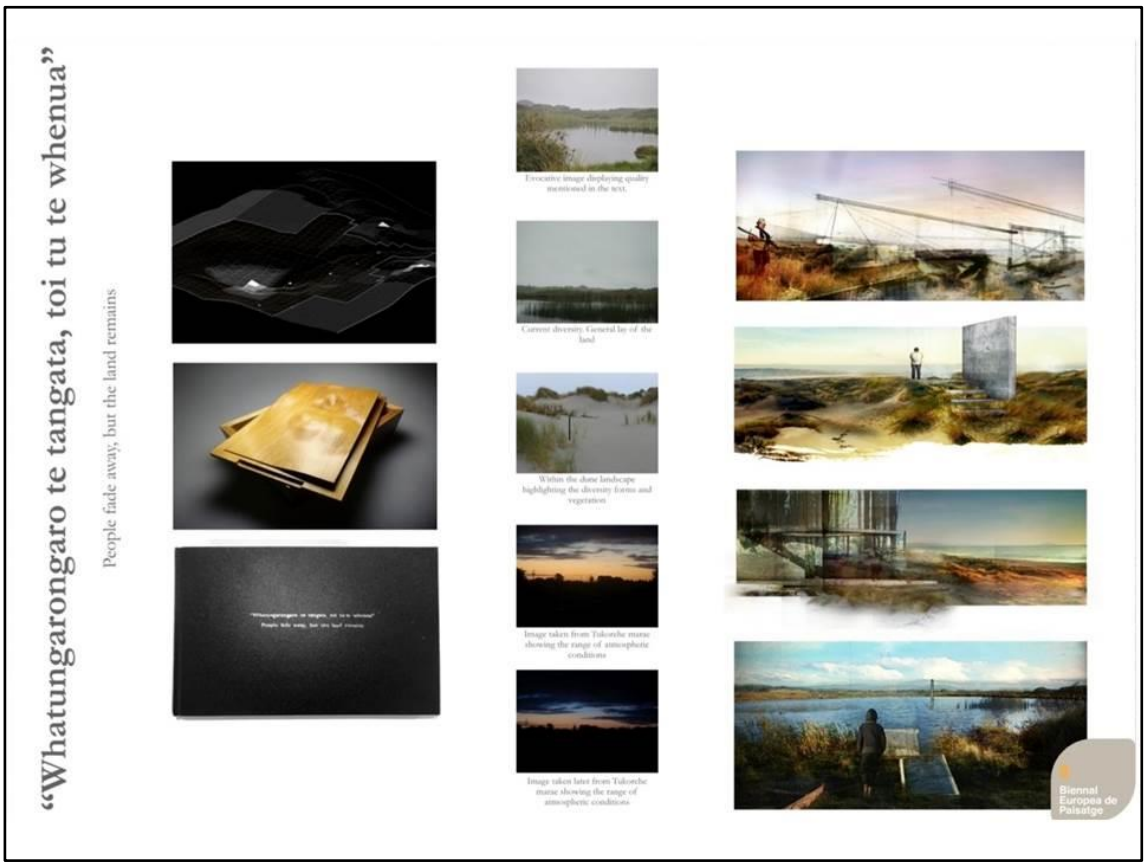
displays. Student Ashley Hunter expressed this in her 'Nga Whakaahua o taa maatou whenua' 2014 design as follows:

> The following intervention came from an initial idea of Tangata Whenua, People of the Land. The connection that the people have with the land is indescribable you can interpret it in many different ways. I have chosen to explore this connection they have brought in the influence of how a Pākehā would relate to this connection through science. This drove the exploration of geology and geomorphology. Exploring what we stand on and the layers built beneath us. The Kāpiti Region is rich with an ever changing geological system that has been built up over many years.
>
> Creating simple interventions that explore both sides of the Māori and Pākehā influences are important as the site belongs to Ngāti Raukawa and reconnecting the people with their land is a most important part of the process. Exhibiting the scientific points of the region is also important as we start to be further educated by what we are all living upon and this will hopefully trigger further exploration in individuals.[1078]

In 2014, some of the selected Landscape Architecture students and their MTM Horowhenua local hapū inspired designs (Figure 6.1.6) were recognised with a Second-Equal prize at the International Landscape Architecture Exhibition of University

[1078] Ashley Hunter, landscape architecture design for Lake Waiorongomai, 2014.

Projects in Barcelona.[1079] The overall bi-cultural design project then won the Te Karanga o te Tui award of excellence at the NZ Institute of Landscape Architects awards in Rotorua 2015.[1080] All of these achievements were underpinned by the efforts of whānau, hapū and kaitiaki members involved in the local hapū case studies including the Lake Waiorongomai restoration project. These awards clearly recognised their active exercise of kaitiakitanga.



[1079] http://www.victoria.ac.nz/architecture/about/news/2014-news/victorias-landscape-architecture-programme-world-class
[1080] http://www.victoria.ac.nz/news/2015/03/winning-landscape-architecture-project -embraces-bicultural-values

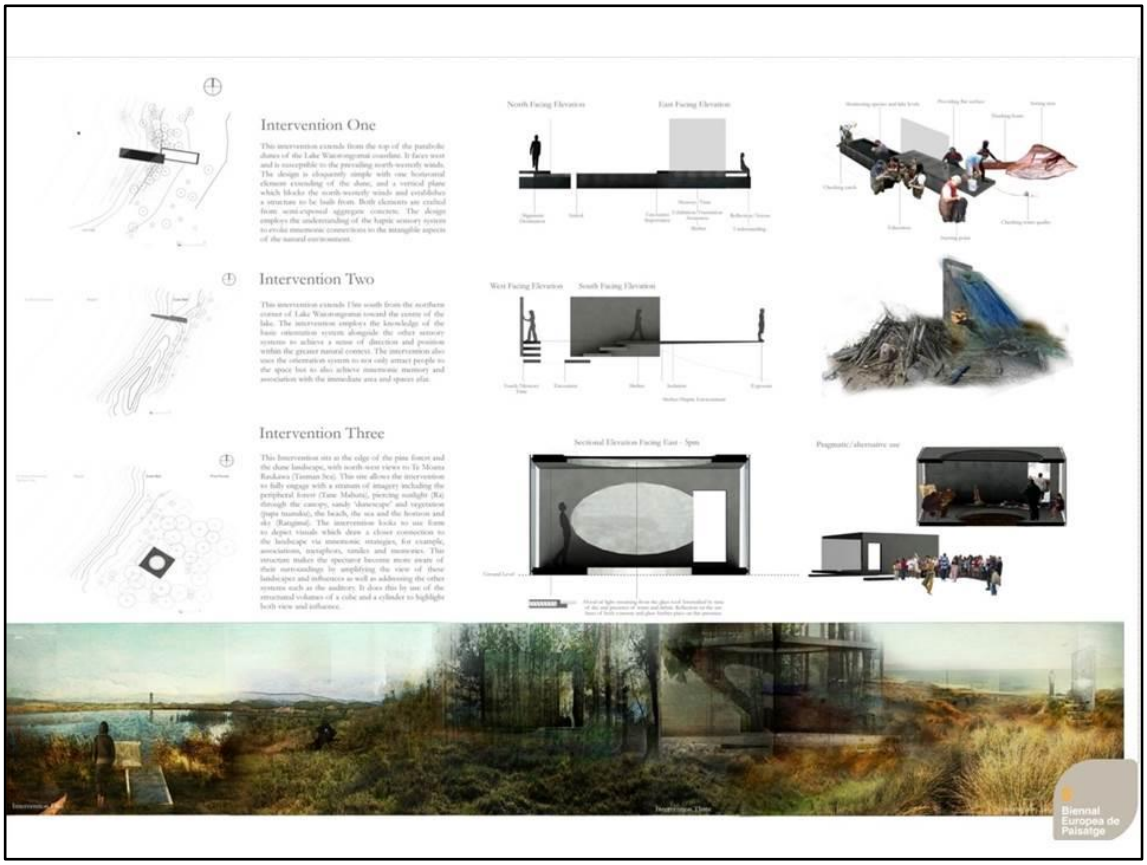


Figure 6.1.6 A Waiorongomai design created by Brad Dodson, Masters, 2013, School of Architecture and Design, Victoria University

Opportunities for creative visual artistic activities and learning were present in the Lake Waiorongomai restoration project, including with the Landscape Architecture students' and with Whakatupuranga Rua Mano in the Rae ki te rae exhibition (Chapter 5, Sub-section 5.3.5). Further activities are described here.

When the Whakatupuranga Rua Mano students were unable to attend the Landscape Architecture Student exhibition in Wellington[1081] due to a severe weather warning they attended Te Takere[1082] in Levin instead. Students created artistic pieces to reflect their kaitiakitanga and pūtaiao[1083] learnings gained from their engagement with the Lake Waiorongomai restoration project. One creative piece focussed on a cow defecating in

[1081] 20 June 2013.
[1082] Horowhenua Culture and Community Centre – Te Takeretanga o Kura-hau-pō. (www.tetakere.org.nz)
[1083] Science.

the lake, while another included orangutan habitats being destroyed for palm oil plantations, which relates to New Zealand's reliance on palm kernel as stock feed. This latter example shows that the young students were aware of global environmental issues as well as local ones. Having the opportunity to express their thoughts in creative forms while experiencing on-the-ground restorative actions were very rewarding for our tamariki[1084].

Huhana Smith (MTM Horowhenua regional project leader) held an art exhibition in 2015, called *Tiaki* at Bartley and Company Art, Wellington.[1085] She used the six local MTM case studies (Figure 1.2.2) as inspiration for her work. One painting was dedicated to the Lake Waiorongomai restoration project, called 'Intergeneration equation' (Figure 6.1.7). Another 'Tiaki' (from which the exhibition got its name) referred to all six kaupapa Māori and action research projects (Figure 6.1.7). The 'Intergeneration equation' piece highlighted the increase in inter-generational engagement amongst landowners in the Lake Waiorongomai restoration project, as landholders exercised kotahitanga (coming together with common purpose) for the sake of the lake.

[1084] Children.
[1085] 56A Ghuznee Street, Wellington.

Figure 6.1.7 'Intergeneration equation', 2015, 300 x 300 mm, oil on linen (top), 'Tiaki', 2015, 500 x 1530 mm, oil on linen (bottom) (*Source: paintings by Huhana Smith*)

6.1.5 Global Positioning System and Geographic Information System used as planning tools

Global Positioning System (GPS) tools were used in the planning stages of the Lake Waiorongomai restoration project to provide geographical positioning information for the proposed fence lines and potential trap locations. Iwi member Rangimarkus Heke from Ngā Whenua Rāhui and GWRC Biodiversity Staff members Tim Park and Michael Urlich also used the GPS equipment to take important location positions (such as trap locations, fence lines, rare plants and noxious weeds) for the project.

These GPS tools, in conjunction with Geographical Information System (GIS) tools such as the computer programme ArcGIS, produced important maps for the case study.

In 1997, Garth Harmsworth wrote a feature article '*Maori values and GIS: the New Zealand experience*' in which he referenced the legislative requirements to take into account Māori values in resource management and environmental planning.[1086] He highlighted the dimensions that GIS technology made available to record and analyse information related to Māori cultural values. However, he cautioned that sensitivity was required, for example to protect the intellectual property rights of hapū/iwi.

Exact positions on the maps were crucial references that aided in accountability reports for funding (e.g. GWRC for fencing and trapping). In some cases discrepancies between agreed planned fencing locations and actual fence lines were identified. This is described in more detail in the next sub-section. In addition GPS positions identified that existing fence lines did not always line up with land block boundaries. It was not until the proposed fence lines GIS maps were produced that the kaitiaki team were made aware that another neighbouring block (Waiorongomai Block 3A) owners needed to be included in the project (Figure 6.1.8). This was because the northern edge of Lake Waiorongomai (and thus the Waiorongomai Block 10) now entered into the Waiorongomai Block 3A. Fortunately this discrepancy was discovered in the initial planning stage and Waiorongomai Block 3A owners were invited to take part in the first LWRP Wānanga.[1087] The GIS maps were thus pivotal as a visual representation that aided in negotiating new agreements and plans.

[1086] Harmsworth, G., 1997, Maori values and GIS: the New Zealand experience, p. 41.
[1087] 22-23 February 2014.

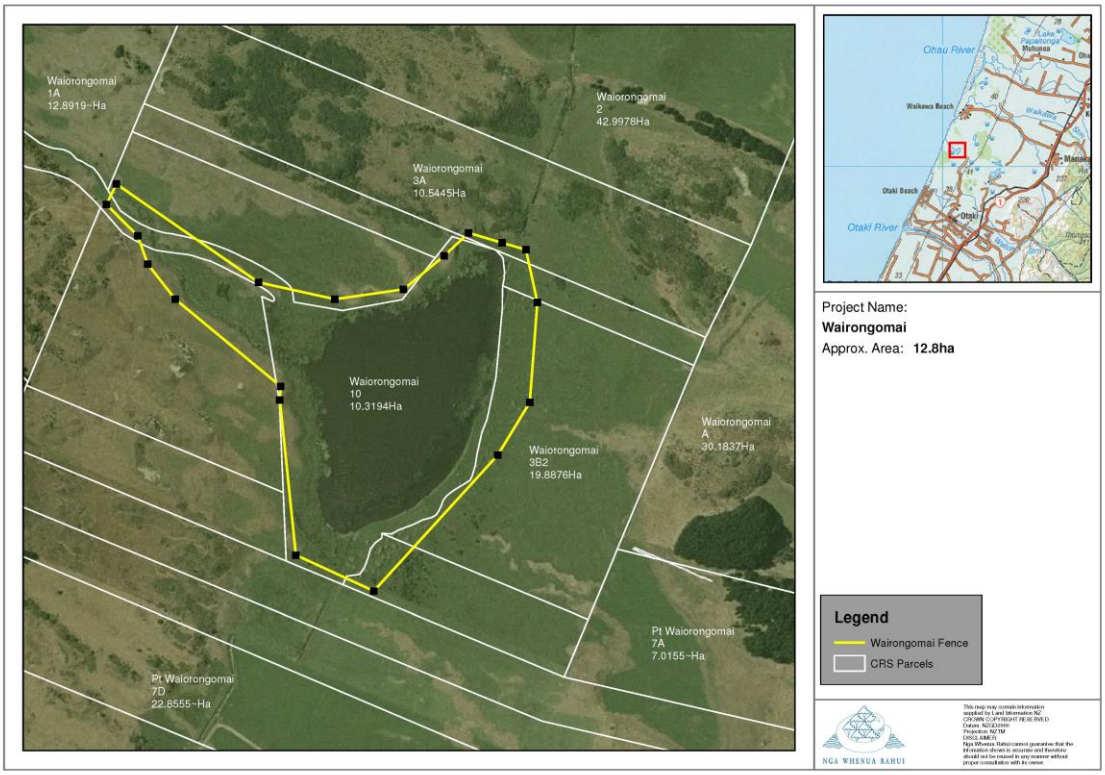


Figure 6.1.8 Lake Waiorongomai Phase 1 proposed fence lines (*Source: created by Rangimarkus Heke, Ngā Whenua Rāhui, 18 September 2013*)

6.2 Restoration methods and adaptive strategies that enabled transformative change on the ground at Lake Waiorongomai

With kaupapa, tikanga, restorative plans and funding in place, the Lake Waiorongomai restoration project moved into action-on-the-ground mode. Activities began with: fencing (Sub-sections 6.2.1 and 6.2.2); pest control (Sub-sections 6.2.2 and 6.2.3); weed control (Sub-section 6.2.4); and native plantings (Sub-section 6.2.5); all described within this section.

6.2.1 Fencing

Early in the project, the fencing of Lake Waiorongomai was the most important restorative action that resulted in transformative change on site and formally established

the Lake Waiorongomai restoration project area. This action made possible the protection of waterways, surrounding wetlands and dunes so that the landscape could be planted and pests as well as weeds removed. A small number of whānau and associated iwi members were included in fencing activities (Chapter 5, Sub-sections 5.3.1 and 5.3.4). By 2 February 2015 the entire Waiorongomai Block 10 was fenced, along with a riparian margin of 50 metres surrounding the lake in most places and 10 metres either side of the Waiorongomai Stream. With two new culverts inserted, cattle were excluded from waterways within Waiorongomai Block 10 – from the lake to the sea (Figure 5.3.12).

Jamie Peryer (GWRC Land Management Advisor – Kāpiti/Porirua) provided advice and approved funding for resource materials to fence off the remaining swamp on neighbouring land that was once Lake Kahuwera (Figures 1.2.2, 3.1.1, 3.2.11, 3.2.12). The GWRC Biodiversity fund in 2017 paid for a culvert extension in the northern drain as well as a new culvert for Waiorongomai Block 3A. The GWRC Land Management department also fully funded the fence line alongside the Northern Drain (one side was already fenced). The work in Waiorongomai Block 3A was undertaken by whānau member Roy Winterburn. Actions included scrub cutting in the summer of 2016/2017, which cleared the area of blackberries for the proposed fence line. After a very wet summer and winter in 2017, the fencing was completed in the summer of 2017/2018 (Figure 6.2.1). At the time of writing, construction of culverts were still underway. The completion of the fence in Waiorongomai Block 3A together with the planned culverts will ensure that cattle no longer enter the northern waterways - Kahuwera Swamp and the northern drain in Waiorongomai Block 3A.

Figure 6.2.1 Transformative changes result from the Northern Drain being completely fenced. From top left in clockwise direction. Photo of the north end at the proposed site for second culvert (*Source: photograph taken by Aroha Spinks, 21 February 2013*). Cattle access and contamination evident in south end of drain (*Source: photograph taken by Aroha Spinks, 13 March 2014*). Waiorongomai Block 3A fence line completes the northern drain fencing (*Source: photograph taken by Jamie Peryer, January 2018*). First new culvert placed in the south end that is proposed in the current consent to be extended (*Source: photograph taken by Aroha Spinks, 11 November 2014*). Log used as a bridge also created a fish barrier at the South end prior to the culvert (*Source: photograph taken by Aroha Spinks, 21 February 2013).*

Photographs of fencing and the resulting transformative changes have also been shown earlier in Chapter 5 (Sub-section 5.3.1 and 5.3.4). The aerial photograph shown in Figure 6.2.2 was taken in 2017 by Laurie Cairns and can be compared to earlier aerial photographs taken by the same photographer in 2009 (Figures 1.3.1 and 3.2.15) as well as those taken in 2007 by Tim Park (Figures 3.2.13 and 3.2.14). The new restoration fence lines are evident in the photograph as an important tangible change that is assisting in the improvement of ecosystem well-being.

Figure 6.2.2 Aerial photograph of the Lake Waiorongomai restoration area (*Source: aerial photograph taken by Laurie Cairns, 28 October 2017*)

6.2.2 GPS and GIS tools used in fencing and pest control

GPS and GIS tools used in the Lake Waiorongomai restoration project provided important geo-referencing information to whānau and hapū. For example, proposed and final fence lines, trap locations, weed control areas, monitoring sites and land block boundaries. Geo-referencing information of exact locations visually depicted on maps during the restoration activities at Lake Waiorongomai were essential.

An example of adaptive strategies that utilised the GIS mapping was when the Waiorongomai Block 3B2 Leasee Hans Somers (also major shareholder of this neighbouring block by power of attorney) became dissatisfied with the actual fencing which was not following the proposed and agreed fencing locations. In the case of the

Lake Waiorongomai restoration project the fencing contractors sought approval of kaumātua to improve the sturdiness of the fence line to increase its longevity. First by increasing the half round posts to full rounds and having more straight lines (i.e. fewer corners). These adjustments were made in good faith by the fencers and whānau to ensure the integrity of the fence was maintained in the very muddy wetland conditions during winter. However the Eastern fence line alongside the lake was placed on hold in the midst of battening. The South Western fence continued with the leasee keeping a close scrutiny of the position.

The GIS maps were pivotal as a visual representation and proof that aided in negotiating new agreements with the leasee. In one particular case it was fortunate that the extension of a wetland area included land not within the 3B2 block. Rangimarkus Heke from Ngā Whenua Rāhui conducted the field data collection of GPS material and used ArcGIS to create the visual maps.

There was a delay in receiving one map (Figure 6.1.8) as Rangimarkus had moved office and relocated towns and thus his computer that had the special software went missing for a short but crucial period of time. As the first LWRP Wānanga loomed closer (and was to include a planned hīkoi to the site with owners), I spoke to Hans Somers about his concerns and dissatisfaction regarding the placement of the fence. My role in attempting to resolve this matter was crucial because I was also aware that local kaumātua had made the decision in the best interest of the owners, (i.e. improving the integrity and longevity of the fence[1088]). In good faith, the leasee agreed to allow fencing to continue on the East side of the lake.

[1088] Eastern fence line alongside Lake Waiorongomai.

Kiwa Raureti started battening the fence straight away. On the wānanga day he started at 6am and finished the fence half an hour before whānau arrived on the hīkoi. Accomplishing that task made the fencers proud of their first completed fence line, which was very meaningful to the whānau too.

The office and equipment of Rangimarkus were soon sorted and a subsequent GIS map produced (Figure 6.2.3). The map showed that the new, partially established fence line for the restoration area incorporated a major share of land in the South Eastern corner. This land was situated on another neighbouring Waiorongomai Block 3B3 which, like 3B1, was owned by a different set of whānau members. The Waiorongomai Blocks 3B1, 3B3 and 3B2 owners who were present at the first LWRP Wānanga, agreed to the fencing adjustment. Hans Somers and his wife Erna Winterburn-Somers (major shareholder of 3B2) were also present at the wānanga and were supportive of the restoration activities. The result was that the new Eastern fence could remain where it was placed.

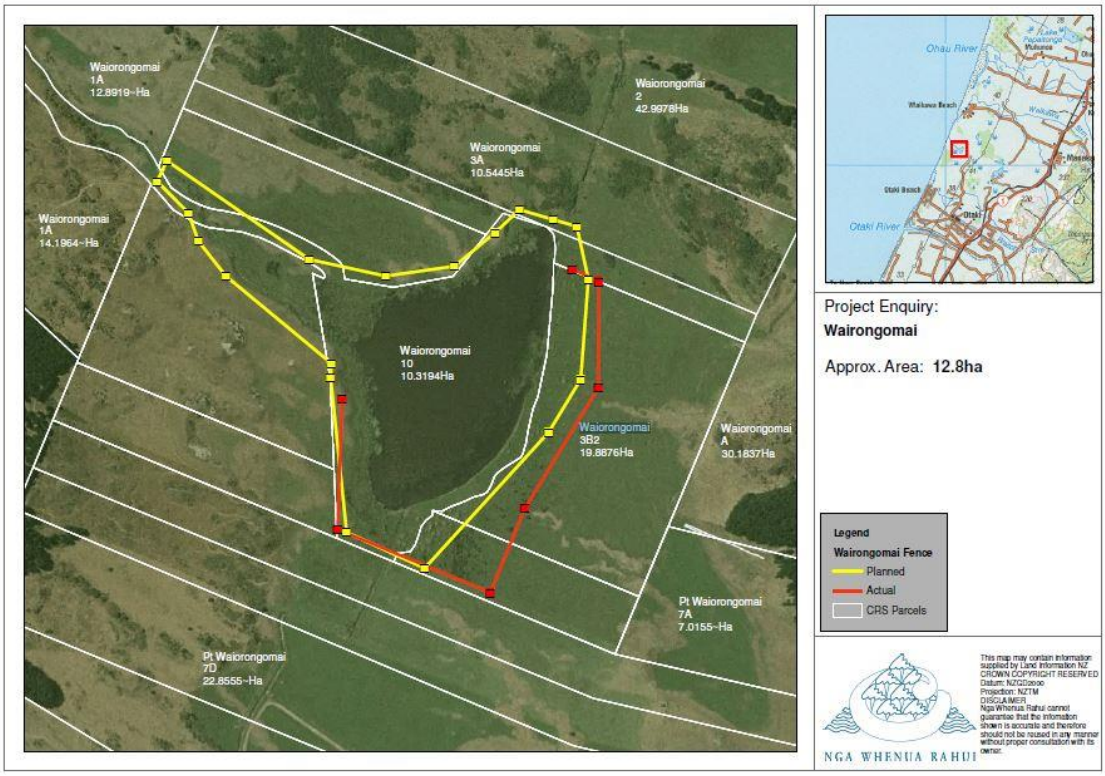


Figure 6.2.3 Lake Waiorongomai Phase 1 proposed and actual fence lines (*Source: created by Rangimarkus Heke, Ngā Whenua Rāhui, 21 February 2014*)

The Lake Waiorongomai restoration project had many layers of complexity, not only within the physical landscape, but within multiple block ownership. Such as the multiple ownership within blocks, whānau land trusts and working with the dynamics of leasee values versus owners/whānau/hapū values. Having the understanding of this complexity within the Māori context as well as cross-cultural context was essential to ensuring that the project was a success. Building relationships within collaborative restoration and research projects can also aid capacity building within hapū.[1089] Having kaumātua on the kaitiaki team who understood the history and whakapapa relationships was important, as these were also crucial in adaptive strategies.

GIS mapping was also used for pest control measures. Maps were produced by Ngā Whenua Rāhui and GWRC to identify and plan the potential trap locations. GWRC

[1089] Forster, M., 2012, The dynamics of hapū research relationships, p. 133.

Biodiversity Coordinator Tim Park recommended an ambitious seventy four traps in 2013, which was adapted and scaled back by the recommendation of Ngā Whenua Rāhui to less than thirty in Phase 1 (Figure 6.2.4). Rangimarkus Heke distributed and set the traps on site, and used GPS tools to pinpoint the actual placement of the traps on site (Figure 6.2.5). The GIS maps produced became particularly useful to future whānau volunteer trappers and the regional council auditors, who went to check the traps. The maps were also useful for accountability purposes and reporting to funders who supported the restoration activities of the project. In Phase 2 only four more additional traps were placed in the restoration area along the Waiorongomai Stream adjacent to Waiorongomai Block 1A (Figure 6.2.5). Checking, cleaning and resetting traps each month took volunteers at least 2 hours. In winter this job was made difficult by mud, as the area was often wet, and therefore required considerable dedication and commitment.

Figure 6.2.4 Lake Waiorongomai potential pest traps indicated by yellow dots (*Source: Tim Park, Greater Wellington Regional Council, 29 September 2013)*

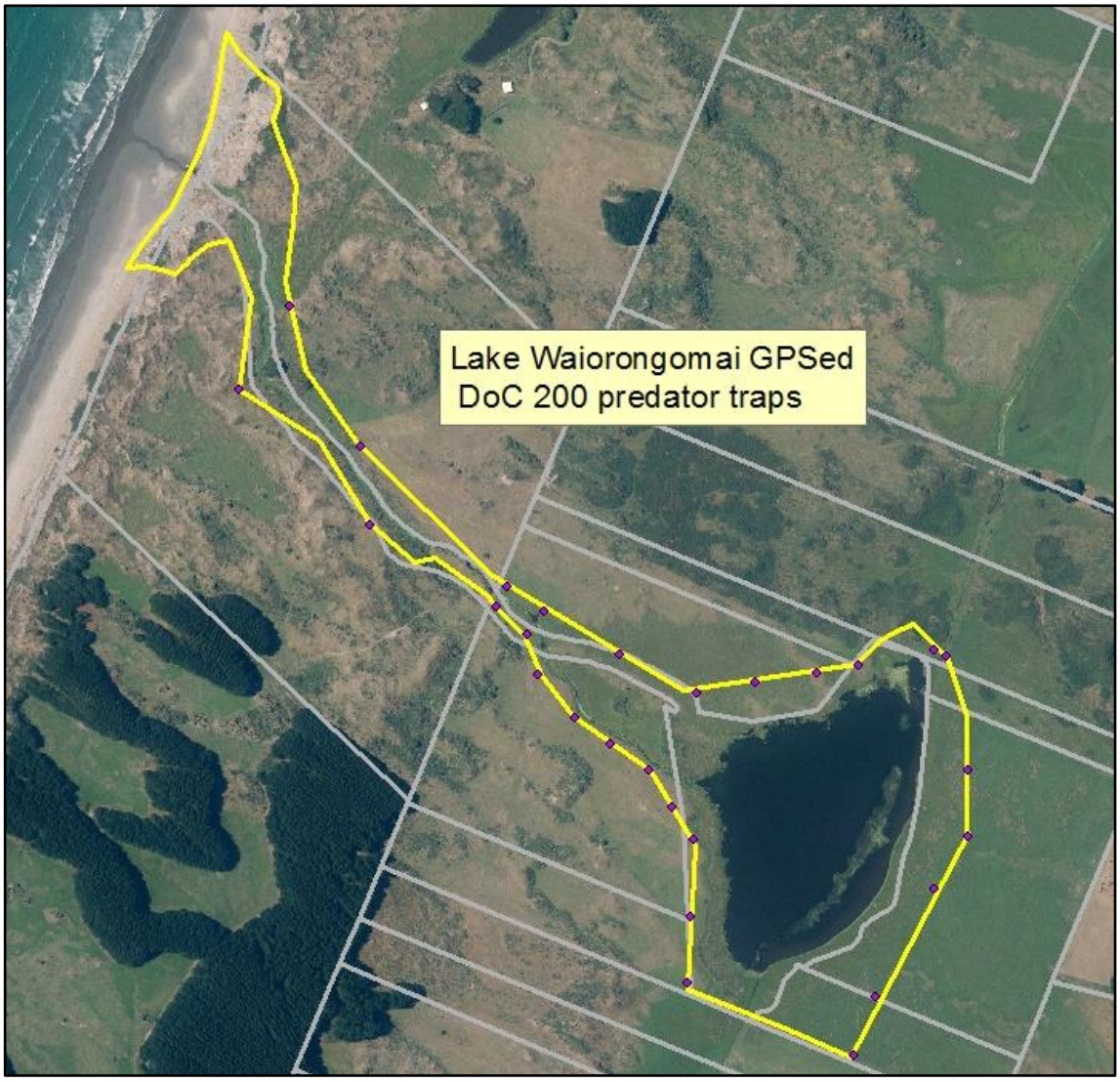


Figure 6.2.5 Lake Waiorongomai restoration area and actual pest control trap locations indicated by purple dots (*Source: Michael Urlich, Greater Wellington Regional Council, 10 February 2015)*

6.2.3 Pest control

After fencing the next aim was to increase plant biodiversity around the lake (with a preference for native species). The pest control measures began in earnest with Rangimarkus Heke monitoring and clearing the twenty nine traps weekly (Figure 6.2.6). After the winter flooding of 2014, a number of the traps were destroyed so some were moved away from the fence line to higher dune locations. By the end of 2014 only twenty four traps were still in use and the team kept to this number (Figure 6.2.5).

GWRC Pest Management Department recommended changing the traps from DOC200 to DOC300 in early 2016, and then reduced the number of traps to twelve. This created a change in the dominant species caught at Lake Waiorongomai. The full spreadsheet of pests caught within the doctoral research period are displayed in Appendix 10).

Figure 6.2.6 Evidence of pests and pest control at Lake Waiorongomai (*Source: Photographs taken by Aroha Spinks and Graham Winterburn, 2014-2016)*

From 3 June 2014 to 21 August 2017, a total of 105 pests were caught in the traps within the Lake Waiorongomai restoration area (Table 6.2.1). Hedgehogs accounted for the highest catch, especially after the introduction of the DoC 300 traps. However, a reasonable number of stoats and ferrets were also trapped (Table 6.2.1). The number of stoats decreased considerably in 2017, and after a site audit[1090] GWRC Pest Control Staff advised that the likely cause of the decrease was not clearing hedgehog spines

[1090] 27 July 2017.

from the traps. Tough gloves and tongs were sourced for our whānau volunteer to clear these traps. Another adaptive strategy was to include the use of possum meat bait intermittently to provide variety with the usual eggs. The introduction of meat was started 21 August 2017.

Table 6.2.1 Pest control monitoring results 2014-2017

	Ferrets	Stoats	Weasels	Rats	Hedgehogs	Cats	Rabbits	All Pests
2014	7	9	2	0	1	0	1	20
2015	2	5	0	4	0	0	0	11
2016	1	8	1	7	25	2	1	45
2017	4	2	0	1	22	0	0	29
Total	**14**	**24**	**3**	**12**	**48**	**2**	**2**	**105**

6.2.4 Weed control

Weed control is an essential activity that aids environmental restoration projects (Figure 6.2.7). Identifying weeds and then creating a plan to address them was followed by implementing appropriate techniques. Although kaitiaki, whānau, hapū, iwi and environmentalists did not want to use chemical methods of weed control it was necessary especially at the start of the restoration project. We agreed with the recommendations of KCDC Biodiversity Officer Rob Cross to target certain exotic species at certain times of the year and KCDC provided the funding. In 2014, Ngā Hapū o Ōtaki contracted iwi member Dean Murray who produced an accountability report after the initial spraying of weeds within the restoration area surrounding Lake Waiorongomai. Along with the report he attached an accompanying letter for the kaitiaki team members to use in discussions, as it drew attention to the large amount of gorse and blackberry on the neighbouring Waiorongomai 3A Block. In his letter Dean Murray wrote:

With my experience in this field, I think, in order to control the noxious weeds growing around the Lake, these neighbouring paddocks also need to be sprayed. Without the control of the noxious weeds in this area, it is almost a pointless exercise spraying around that Lake area as the seedlings will almost consistently be blown across with the predominately North West wind this area experiences.[1091]

Figure 6.2.7 Photographs of weeds and the effects of control measures at Lake Waiorongomai. Photo's clockwise from top left. Hornwort close up. Hornwort along the lake edge and in the lake amongst raupō and rushes (*Source: Photo's taken by Aroha Spinks, 1 October 2014).* Gorse dying back (*Source: Photo taken by Aroha Spinks, 1 October 2014).* Lily removed manually. Boxthorn plants. (*Source: Photo's taken by Aroha Spinks, 31 January 2014)*

[1091] Dean Murray, Letter dated 15 September 2014.

In 2015, the Waiorongomai Block 3A owners' representative and major shareholder, Wehi Nicholls, provided Rupene Waaka with approval to spray a 50 metre area along the adjacent fence line at the North end of the Lake Waiorongomai Restoration Area. KCDC contracted and paid Dean Murray directly through a Heritage Fund application. With the fencing complete for the entire Waiorongomai Block 10, the weed species in the restoration area along the Waiorongomai Stream and nearby Waiorongomai 1A Block were sprayed. A dominant weed was boxthorn (*Lycium ferocissimum*) which, along with gorse, were targeted by Dean. He sprayed and burned the long spikes to prevent them staying in the ground for many years, causing injuries in the future. This was deemed especially important to the whānau in a whānau (Rikihana) camping area. With the permission of the Waiorongomai 1A trustee and leasee, the boxthorn outside of the actual restoration area and within the Waiorongomai 1A Block was also targeted.

Towards the end of 2014, I spoke with Deanna Rudd[1092] about the Lake Waiorongomai restoration project progress to date, and about her assignment for studies at Te Wānanga o Raukawa. Deanna Rudd commented that an expression that she had thought of encapsulated the restoration work out at the lake '*whakaora te whenua, whakaora te whānau*'[1093]. I was interested in this expression as a description of transformative change and improvement to the land at the restoration site. She wondered if perhaps I was not aware of other aspects of the restoration project happening behind the scenes. One example she shared was that someone within the whānau had dumped garden material out at the lake. That person had been paid a visit by other whānau members who explained the positive restoration activities occurring at Lake Waiorongomai and persuaded them to clean up the mess. The whānau encouraged the culprits not to do it

[1092] Whānau member: Ngāti Raukawa ki te Tonga, Ngāti Maiotaki.
[1093] Improving the health of the land, improves the health of the family.

again and instead, to concentrate their energies on positive contributions to the Lake's wellbeing like turning up to a whānau planting day.

6.2.5 Planting

Whānau planting days provided the main opportunity for whānau and hapū to be involved in restorative measures. Whānau determined that the second weekend of the Winter months would be their scheduled time for planting weekends. Attendance varied from numerous, to only a few on occasions. A lot of whānau who attended lived locally but others travelled from Wellington, Wainuiomata and as far away as Taupō. Over 3000 native trees (e.g. mānuka, kānuka, tī kouka, tuapata, mingi mingi, toe toe, ngaio, whauwhaupaku, mahoe, ake ake, wiwi, kahikatea, kawakawa) and over 1000 transplanted harakeke have now been planted in the restoration area. Native plants that were already present, as well as the newly planted seedlings have flourished in these past four years. The transformative change of plant growth within the landscape is illustrated in Figures 6.2.8 and 6.2.9.

Figure 6.2.8 Photographs of Tī Kouka growth in the Lake Waiorongomai restoration area. Photo's clockwise from top left. Barbara Ford spreading seeds (*Source: Photo taken by Aroha Spinks, 23 February 2014)*, Tī kouka recently planted (*Source: Photo taken by Aroha Spinks, 13 April 2014)*, remaining photos of Tī Kouka growing strong in 2017 (*Source: Photo's taken by Aroha Spinks, 3 October 2017)*

Figure 6.2.9 Photographs of native plants growth in the Lake Waiorongomai restoration area 2017 (*Source: Photo's taken by Aroha Spinks, 2017)*

The following example shows how planting activities required adaptive strategies that were usually determined by whānau. During the 2015 winter months the rain was unrelenting and the lake level gradually got higher. Some of the surrounding ephemeral wetlands next to the lake had metre high water levels. There was no possible way to drive plants to the proposed planting locations.[1094] As explained earlier in Chapter 5, Section 5.4 we had reduced the number of plants and species that we were planting. During the July 2015 planting event, one whānau member, Tipi Bevan, asked, "Why don't we row the plants across to the other side?"[1095] Since a number of Ōtaki whānau members row across the Ōtaki River to set their nets in front of their Katihiku Marae, this seemed like an obvious answer to the access issue. Tipi volunteered himself and his brother (digging next to him), saying "that's us next month aye Mole."[1096] With an affirmative reply, the revised plan was set with an adaptive strategy for the next whānau planting day.

When I discussed this idea with Graham Winterburn, the idea gained momentum. He offered his row boat and suggested that we tie it to Rupene Waaka's boat and tow it across the lake with the plants in it. The following month (15 August 2015) when Tipi and Martin (Mole) Bevan arrived, along with Graham Winterburn, it took them only one trip across Lake Waiorongomai to deliver the plants to the dunes on the North Eastern side of the lake as planned (Figure 6.2.10). An additional bonus, was that a few kuia to their delight caught a boat ride back across the lake after the planting activities had ended (Figure 6.2.10). We continued with the rowing strategy, for the remainder of the whānau planting days that 2015 winter.

[1094] On the north western edge of Lake Waiorongomai.
[1095] T. Bevan, personal communication, 11 July 2015.
[1096] Ibid.

Figure 6.2.10 Planting in August 2015 and rowing on Lake Waiorongomai (*Source: Photographs taken by Aroha Spinks, 15 August 2015)*

6.3 Doctoral research methods used to enable and record transformative change in the Lake Waiorongomai restoration project

A range of different methods were used to record events and restoration activities that occurred during the Lake Waiorongomai restoration project and doctoral research endeavour. Doctoral research evidence was gathered concurrently using visual methods such as photographs (6.3.1), drones (6.3.2) and film footage (6.3.3) and creative artistic activities (explained earlier 6.1.4). Further doctoral research evidence was gathered using mixed methods of qualitative and quantitative data. Qualitative methods and activities detailed in this section include; oral interviews (6.3.4), wānanga (6.3.5), hui

and hīkoi (6.3.6). The theoretical underpinning of narrative methods used within this doctoral thesis is briefly outlined in Sub-section 6.3.7.

Quantitative methods used were mainly associated with the baseline ecological monitoring referred to within Sub-section 6.3.8. Scientific methods used to collect data for different ecological indicators, is described in detail in Chapter 7, Section 7.2. The quantitative data collected during pest control trapping excursions was collected monthly (Sub-section 6.2.3).

6.3.1 Photographic footage

Photographs and video footage were collected throughout the restoration project. At the beginning of the project these images showed live and dead cattle in the waterways; pests; weeds; and other ecological degradation. The footage also shows the passion and interest of the people involved. These visual mediums were used during different stages of restorative process including hīkoi, hui and wānanga. Photo collages have also been used as evidence throughout Chapters 5 and 6. All the photos and videos that were taken during the restoration project by myself for this doctoral research endeavour have been provided on a hard-drive storage unit to the chair of Ngā Hapū o Ōtaki (Rupene Waaka). This action addressed the promise I made to whānau and hapū at the start (1 August 2013) in regards to the intellectual property of material I collected for my doctoral research endeavour.[1097]

The technology available at the start of MTM (i.e. 360^{oC} panoramic photography and video footage) made it possible for us to depict the state of Lake Waiorongomai before and during the restoration project (Figure 6.3.1). Particular locations within the

[1097] Described in sub-section 5.3.1.

restoration area were also chosen to capture photographic evidence of ecological restoration (change detection). Two location examples can be seen in Figure 6.3.2.

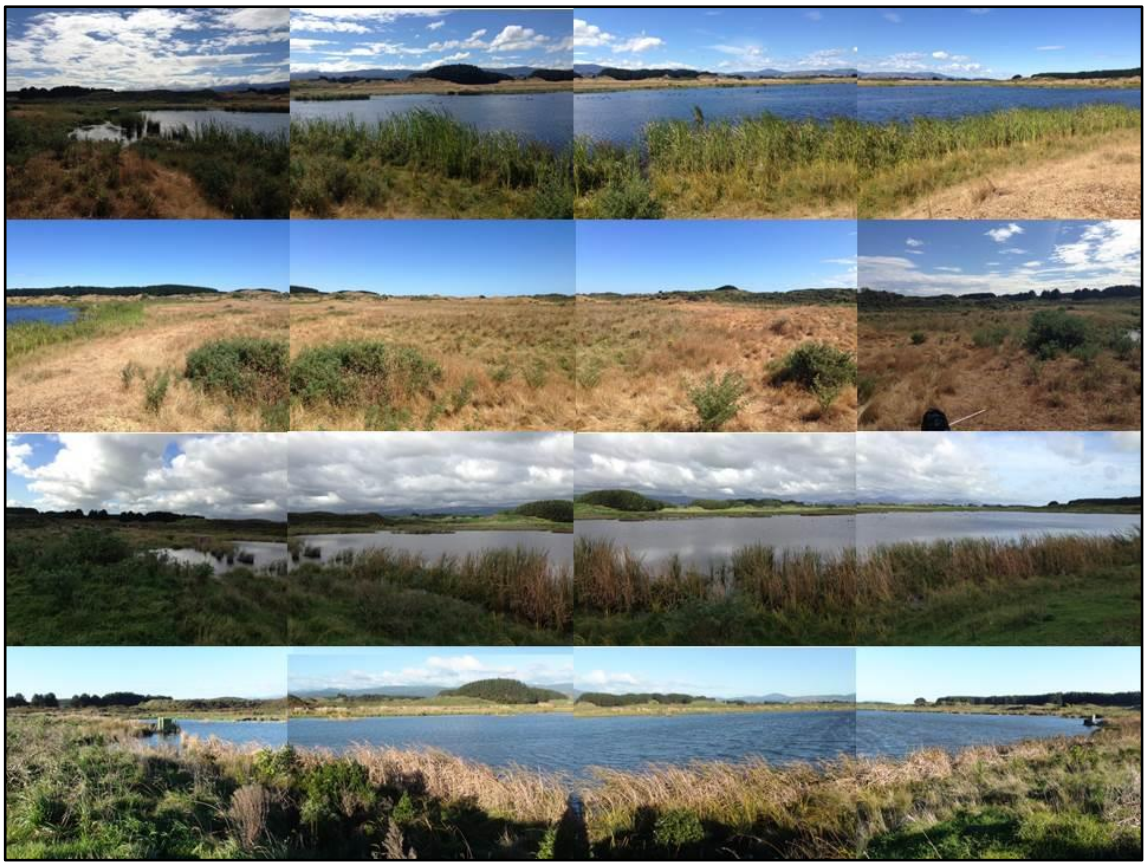


Figure 6.3.1 An example 360°C photographs that show the ecological improvement within the landscape over time. The top two rows is a 360 °C example, the next two rows are 180 °C showing the area planted in 2015 with native plants (*Source: photographs taken by Aroha Spinks, 28 January 2015 (top), then 18 May 2015 and 14 June 2017 (below))*

Figure 6.3.2 Two sites (left east side of lake, right north west side of lake) used as examples that were revisited to show the ecological improvement within the landscape over time (*Source: photo's taken by Aroha Spinks, top left in a clockwise direction, 12 April 2014, 18 May 2015, 14 June 2017, 19 May 2015)*

I-books were produced by the MTM Horowhenua research team for the six local case studies. These resources were created easily by MTM team members using AppleMac computers and software, then purchased from and printed by AppleMac. The result is a high quality book with stunning images. The MTM i-books that directly relate to the Lake Waiorongomai restoration project include the following titles: *Lake Waiorongomai Restoration Project Wānanga 2014* created by myself and *Whakahokia te ora ki a Waiorongomai: Return health to Lake Waiorongomai* by Huhana Smith.[1098] One i-Book created by Moira Poutama was dedicated to oral narratives, *'Ngā kōrero*

[1098] Spinks, A., 2014, Lake Waiorongomai restoration project wānanga 2014 (unpublished book); Smith, H., 2014, Whakahokia te ora ki a Waiorongomai: Return health to Lake Waiorongomai. (unpublished book)

tuku iho.'[1099] This resource included interviews specifically conducted for the Lake Waiorongomai restoration project and because of this has been under embargo until the release of this doctoral thesis.

The i-book resources proved to be an excellent way of capturing 'collective effort' in visual form and were well received by hapū and participants at hui. When appropriate and specifically relating to an event or case study a copy of the i-book was also supplied to funders. For example, the first LWRP Wānanga held 22-23 February 2014 at Raukawa Marae, the restoration focussed i-book[1100] was supplied to Ngā Hapū o Ōtaki and the Department of Conservation.

6.3.2 Drone footage

A visual technique used to capture change detection during the MTM case studies was the use of drone technology built and flown by staff from WakaDigital.[1101] Taiao Raukawa renamed the MTM drone "Kapowai" (dragonfly) before it was released by technicians on our coastline. The visuals captured of Waiorongomai by the drone are available on the MTM website.[1102] In 2016, Ngā Hapū o Ōtaki purchased a drone for their own hapū use. Rupene Waaka used the device to record two of the whānau winter planting days in 2015 (Figure 6.3.3) and has stored the footage for hapū use.

[1099] Poutama, M., (date unknown), Ngā kōrero tuku iho. (unpublished book) NOTE: the date is unknown as the book is currently under embargo until the release of this doctoral thesis.
[1100] Spinks, A., 2014. (unpublished book)
[1101] WakaDigital a collaborative partner in the MTM team. www.wakadigital.co.nz
[1102] www.mtm.ac.nz

Figure 6.3.3 Rupene Waaka using the Ngā Hapū o Ōtaki drone to capture footage of the whanau planting day in 2016 (*Source: photographs taken by Aroha Spinks, 9 July 2016)*

6.3.3 Film footage

Video recording was an important visual method to record events that occurred during the Lake Waiorongomai restoration project and doctoral research endeavour. The following example is an important narrative about a young whānau member who used the knowledge she gained at school with the opportunity of being involved in the restoration project, to gain further skills and experiences in film making.

On 15 August 2015 during the whānau winter planting day, a twelve-year-old whānau member and Whakatupuranga Rua Mano student Eva Hakaraia[1103], arrived with her

[1103] Ngāti Raukawa, Ngāti Kapu.

Aunty and kaitiaki team member Libby Hakaraia[1104]. Libby brought video recording and explained that she had been teaching the students at Whakatupuranga Rua Mano filming and editing techniques. Eva explained her desire to film local restoration projects and enter the Conservation Category of the Outlook for Someday Sustainability Film Challenge for New Zealand students. All whānau present were supportive of Lake Waiorongomai being included, although many shied away from the camera. Libby gave her niece a few extra tips before she left to film another job elsewhere. Eva accompanied us and caught the planting day activities on film while, pleasantly surprising herself that she enjoyed the planting activities a lot.

Eva Hakaraia asked if she could interview me for the film and I agreed. Likewise, she allowed me to interview her for evidence in my doctoral research. Here are a few of her reflections on the planting experience:

> It was fun and very satisfying work, I have to say. Yeah I liked it. It is nice to get out a bit more than usual... I'm making a film about sustainaibility and I want to do it about people that help out like at the beach and around here at Lake Waiorongomai.[1105]

Afterwards we talked about the planting experience and the whānau mahi that had been accomplished. I mentioned to Eva, "I love getting paid to do this". Eva threw up her hands suddenly, almost tipping over backwards down the dune exclaiming, "What? You get paid to do this!" I said "Yes, and man I wish I had got that on film." She commented next, "I want to get paid to do this when I get older." I replied, "Not only could you get paid to do this in the future you could also film it and become a famous director like your Aunty."

[1104] Ngāti Raukawa, Ngāti Kapu.
[1105] E. Hakaraia, 15 August 2015, personal communication.

Eva Hakaraia did not have to wait that long for local fame, as she was shortlisted as a finalist in the Outlook for Some Day Sustainability Film Challenge 2015. She was flown to Auckland with her Aunty Libby to attend a red carpet event. Her *'I love Waiorongomai'* film won one of the top five awards out of 156 entries in the Outlook for Some Day Sustainability Film Challenge 2015 - the Department of Conservation's Big Picture Award. The local Ōtaki and Kāpiti newspapers also wrote articles on her and her cousin Oriwa Hakaraia[1106] (Figure 6.3.4). Oriwa Hakaraia[1107] (another Whakatupuranga Rua Mano student) also won a prize for her *'Koro Puppeteer'* film in the Outlook for Someday Sustainability Film Challenge 2015.[1108,1109] Eva Hakaraia's film was shown at the Māoriland Film Festival[1110] organised by Libby Hakaraia in Ōtaki, 23-27 March 2016. Notably it has also been picked up to be shown at an International Film Festival.[1111] An abstract from the Kapiti Observer:

> Both girls wrote the scripts, shot and edited their films. Eva said she was inspired to make her movie after attending a planting day held by Manaaki Taha Moana earlier this year. "They're not famous. Not a lot of people know them, but they're making the world a better place."[1112]

The whānau and hapū (as well as MTM project team) remain very proud of these achievements.

[1106] Kapiti Observer, 17 December 2015, Cousins linked by film passion, p. 12; Ōtaki Mail, Christmas 2015, Ōtaki junior filmmakers triumph, p. 7.
[1107] Ngāti Raukawa, Ngāti Kapu.
[1108] Both films can be viewed on the Outlook for Some Day website (www.theoutlookforsomeday.net) by placing keywords into the winning films search facility.
[1109] http://www.theoutlookforsomeday.net/winning-films/?search=1&genreid=&tagid=&keywords=waiorongomai
[1110] www.maorilandfilm.co.nz
[1111] P. Hakaraia, 26 March 2016, personal communication.
[1112] Kapiti Observer, 17 December 2015, p.12.

Figure 6.3.4 Eva Hakaraia filmed the Lake Waiorongomai restoration project. Photo's clockwise from top left – two photos of Eva Hakaraia learning filming techniques from her Aunt Libby Hakaraia, then Eva participating in planting activities (*Source: photos taken by Aroha Spinks, 15 August 2015*) then a photo of cousins Eva and Oriwa Hakaraia who both won awards for their films in the Outlook for Someday Sustainability Film Challenge (*Source:Kapiti Observer, 17 December 2015, p. 12*)

The filming accomplishment also provided the opportunity for a kura parent and hapū member Sean Bennett-Ogden[1113] to write a related article in te reo Māori. This was later printed in a schools education publication.[1114] Sean Bennett-Ogden sourced material from Rupene Waaka and Te Waari Carkeek after receiving their approval prior to writing and releasing the following piece to media. This is the story about Lake Waiorongomai and where it got its name from, the journey of Haunui-a-nanaia through the region.

[1113] Ngāti Tukorehe, Ngāti Raukawa, Ngāti Kapu, Ngāti Rangitane.
[1114] S. Bennett-Ogden, personal communication, 3 July 2017.

Ina, tae noa atu ai te tangata ki Otaki, kahore pea ia e kite atu i tetehi o nga tino puna o tera takiwa. Ki tua ra ano o nga tahuna, e takoto kau ana tenei roto ki te raki o te awa o Waitohu. Ko Waiorongomai taua puna.

Ko Waiorongomai tetehi o nga tino roto no roto mai i te rohe o Ngati Raukawa ki te tonga, otira, ki roto o Otaki.

Na Haunui a nanaia nga tongi whenua mai i Whanganui ki te Wairarapa i tapa ki ona ingoa. i te otinga o tona haere, I rere mai ia i te Wairarapa i runga i a Rongomai, he auahi turoa. I utuki raua ki Otaki, na, i tapa atu i te ingoa o Wai o Rongomai hei ingoa mo taua wahi. Kua mau tonu ki te roto nei tenei ingoa i te wa i murua ai e Te Rauparaha te rohe nei. Hei wai pure tenei wai mona, mo ona toa. Hoki mai ai ratou i nga pakanga, i rukua e nga toa a Te Rauparaha kia purea ratou ki aua wai maori.

I heke mai a Ngati Raukawa i Maungatautari, a, i tukuna e Te Rauparaha tona puna pure o Waiorongomai ki a Matiu Te Rorohau o Ngati Moewaka, o Ngati Kapu. Na Matiu nga hapu o Ngati Waihurihia me Ngati Maiotaki i manaaki ki taua kainga.

I te wa i whakaturia te whare karakia rongonui o Rangiatea, i riro ma nga rawa kai o Waiorongomai nga kaimahi e whangai. I kiia nei he pataka kai, he koha no enei hapu ki te mahi nui whakaharahara nei.

To tena hapu tona pa tuna, to tena whanau tona pa tuna, i ora pai ratou ki tera kai reka a te maori, ara ko te tuna.

> Tupu mai ana te tamaiti ki Otaki, ka rongo rawa ia mo nga rawa o taua wai.
>
> Hei puna kai, hei nohoanga tangata a Waiorongomai, he putanga no te korero. [sic][1115]

6.3.4 Oral interviews with kaumātua and kaitiaki

Moira Poutama scheduled and conducted a number of MTM oral interviews in order to produce a beautiful publication of the kaumātua and kaitiaki kōrero *'Nga kōrero tuku iho.'* A number of the MTM oral interviews included the Lake Waiorongomai case study. Thus, was embargoed until the release of this doctoral thesis, due to information within this I-book being collected as results for this research endeavour.

I organised oral interviews with the Lake Waiorongomai whānau members and arranged to meet them at locations and dates of their choice. That included their homes, my home, an office or a quiet café. Sometimes I conducted the interview alone and at other times I conducted them alongside Moira.

At times, video recordings of kōrero at Lake Waiorongomai occurred despite windy conditions. Because of inadequate video equipment, the sound quality of these recordings was poor. We learnt from this and recommend that plans for future restoration projects include appropriate video sound recording equipment that can handle all weather conditions. Due to the environmental aspect and sacredness of the location it was at times a preference for kaumātua and kaitiaki to be filmed within the landscape. Our strategy adapted to take all video recordings indoors. This approach was not ideal but necessary in our case.

[1115] Permission for use provided by Sean Bennett-Ogden in 2016.

Research that involves interviewing has an expectation that appropriate records are completed. New Zealand ethics guidelines are available.[1116] Interview consent forms had been developed for the MTM research programme and we used these same forms for the Lake Waiorongomai case study. A consent form template has been developed as a guide (Appendix 11).

Video recordings as mentioned were conducted by Moira Poutama and myself. From our experience it is important to mention that Māori (in particular kaumātua) often preferred to keep the interview process casual and free flowing in a conservational style rather than use of the questionnaire. Reflecting further on our oral history interview process, some people we talked to felt more comfortable having whānau around and being recorded in an environment that they were familiar with.

In accordance with tikanga and interviewee preferences the oral interview events began and ended with karakia which were not recorded. Mihi and pepeha[1117] were at times exchanged and sometimes recorded.

Nick Albert's oral interview was conducted on site at Lake Waiorongomai on the 17 November 2014 in windy conditions that interfered with sound quality. Due to the poor record produced for the hapū this was the final oral interview conducted on site at Lake Waiorongomai during this doctoral research endeavour.[1118]

To complete this sub-section on oral interviews is a reflective interview with whānau member Graham Winterburn held on 30 September 2017. Graham requested an onsite interview, however due to my recommendation that the quality of the record would be improved if it was conducted indoors he agreed. As an active kaitiaki, he spoke of his

[1116] National Oral History Association of New Zealand/Te Kete Kōrero-a-Waha o Te Motu, 'Code of ethical and technical practice' and 'Oral history recording agreement form'.
[1117] Tribal saying.
[1118] Only just audible his kōrero was quoted earlier in Chapter 5, Sub-section 5.4.4.

involvement in the Lake Waiorongomai restoration project and the transformative changes that he had witnessed. While conducting the pest control checks each month he was a regular visitor to Lake Waiorongomai throughout the year.

> I've been hunting on the lake for a good 30 years now, duck shooting. Back in Maui Pomare's time. Over those 30 years there has definitely been a noticeable change in the lake. It has dried up a lot more. The wildlife hasn't increased. It has been steady over the years… I remember when shooting out there in my early days there was flax for miles. It was to find the lake edge in the dark.
>
> I've been doing the pest control now for 3 years which has been fantastic. It is disappointing now as I'm not getting the good stuff. So if you look at our results it started off with the lots of stoats, ferrets and rats so it shows it is definitely working.... Now it is mostly hedgehogs.
>
> We've been to a few plantings. There is four maimai on the lake. I've brought my guys out planting. It is our way of putting a little bit back for the privilege of using the lake… I can't wait to see the lake get back to some of it's former glory. The planting is looking so good out there now. The cabbage trees are thriving, the flax are doing well... One of the things I noticed last year when I was checking the traps was the ducks now nesting in the long grass. Because we've fenced the lake so

> far back now there is all this tall grass growing to the lake edge. There are ducks now nesting there.
>
> It's good to see some of the whānau at the planting days that you haven't seen for a while. It is good to see the young guns there. There was a lot at one planting. We had a heap of young kids there. That's the way to get things done. The young ones are spending too much time on computers these days and not getting outdoors as much. They are not using the lake like we used to. I used to go out there eeling with my father. We would take the eels home, get a 44 gallon drum, stick a fire underneath and smoke em.[1119]

6.3.5 Wānanga

Wānanga method was used by the MTM Horowhenua research team to engage whānau, hapū, kaumātua, kaitiaki and resource gatherers to identify issues, kaupapa, plans and restoration activities.[1120] Wānanga audiences included whānau, hapū, students (from learning institutes) and sometimes community members (Figure 6.3.5). Lake Waiorongomai restoration project wānanga included powerpoint presentations by whānau, hapū and iwi members (often involved in the local case study) that provided important knowledge of place and historic memories. Presentations by community members and external organisations that were supporting the research programme were also incorporated to make it possible for these participants to share their expertise.

[1119] Interview with Graham Winterburn, 30 September 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.
[1120] Smith, H., *et al.*, 2014, He tirohanga whānui: An overview of ecosystems undergoing rehabilitation with Manaaki Taha Moana Project and the Horowhenua case study, pp. 55-57.

Presentations addressed ecological decline issues, highlighted the active work being undertaken by the whānau and hapū and encouraged further potential actions.

Figure 6.3.5 He Iti Nā Mōtai on wānanga at Lake Waiorongomai (*Source: photos taken by Aroha Spinks, 14 September 2016*)

Hīkoi was another important aspect of wānanga that brought the kōrero and visual presentations into participants' reality as they experienced the ancestral landscape, loss of natural integrity and restorative actions first hand (described in further detail in the following sub-section 6.3.6). It is not unusual for Māori to include hīkoi to sites of significance during wānanga and hui that involve ancestral landscapes. For example, Horiana Joyce from Ngāti Maiotaki hapū organised a hīkoi to Lake Waiorongomai prior to the restoration project.[1121]

[1121] Joyce, 2000, pp. 24-25.

The two annual LWRP wānanga were perfect reflective opportunities for the whānau and hapū.[1122] Both wānanga were a mixture of kōrero at the marae and onsite hīkoi to the restoration area (for example the agenda in Appendix 2). Presentations provided updates on restorative actions to date. Workshops gave the whānau a chance to guide the restoration plans for the future. This approach honoured their authority as the owners and beneficiaries of the taonga[1123], project and research. They determined their future aspirations an expression of their tino-rangatiratanga[1124] and knowledge development. The LWRP wānanga were conducted in accordance with local tikanga.

The advertisement placed in national and local newspapers to attract whānau and hapū members were reviewed, changed and approved by kaitiaki. The following designed by Rupene Waaka is the kōrero sent to newspapers in 2014:

> NAU MAI, HAERE MAI KI
> Ngā Whānau Whānui o
>
> Block: Waiorongomai 10 (Lake)
> Block: Waiorongomai 3A
> Block: Waiorongomai 3B1
> Block: Waiorongomai 3B2
> Block: Waiorongomai 3B3
> Block: Waiorongomai 1A
>
> Wānanga Sat-Sun 22-23 Feb 2014
> Whakatau @ 9.30am Sat
> Raukawa Marae, Otaki
> Contact details[1125]

[1122] 22-23 February 2014 and 13 June 2015.
[1123] In this case Lake Waiorongomai, the surrounding wetlands, stream and land etc.
[1124] Absolute sovereignty.
[1125] Note: private details of phone and email contact details have been omitted from the doctoral thesis.

6.3.6 Hui and hīkoi

Hui were often held at Taaringaroa, an office adjacent to the Raukawa Marae on Mill Road, Ōtaki (Figure 6.3.6). Although within a cultural space, this office involved less tikanga (i.e. no pōwhiri[1126]) and less whānau to manaaki the marae itself (e.g. to karanga, whaikōrero[1127], cater, clean etc). However, tikanga within this building included karakia at the beginning and completion of meetings as well as mihimihi[1128] if the guests were not well known to the whānau and hapū. Hui provided opportunities to utilise te reo Māori and tikanga within the restoration project and doctoral research endeavour.

Figure 6.3.6 Hui at Taaringaroa in Ōtaki (top) and Waiorongomai 1A Trust hui at Te Takere in Levin (bottom). (*Source: top photos taken by Aroha Spinks, 13 June 2015, bottom photo taken by Te Tumu Paeroa staff, 7 March 2018*)

[1126] Welcome ceremony on a marae.
[1127] Formal speech.
[1128] To greet, pay tribute.

Hīkoi or ‘walking and talking hui’ was another important method used within the MTM Horowhenua regional case study as it allowed first-hand experience of the ecological concerns, restoration activities, as well as of the mauri and wellbeing of the site. Presentations, photographs, drones and film footage are good, but on-the-ground experiences is even better. All the senses are triggered and the messages from ancestral and cultural landscapes are better received when being inside the consciousness of the site (Figure 6.3.7).

Figure 6.3.7 Hīkoi around the Lake Waiorongomai restoration area *(Source: photos taken by Aroha Spinks, from top left in clockwise direction 13 June 2015, 2 x 24 March 2015, 11 July 2015)*

After a hui and some hīkoi (e.g. those that included guests), a meal was usually provided by the whānau or Ngā Hapū o Ōtaki. This expression of manaakitanga is important culturally to Māori. A hint to external organisations attending hui with

whānau, hapū or iwi is that, it is culturally appropriate and appreciated (but not necessary) to contribute to the shared kai.

6.3.7 Narrative

This doctoral research thesis used narrative (in Chapter 5 (Section 5.3) and 6) as another method to express the restoration endeavours and efforts of whānau, hapū, iwi and the wider community. Traditionally narrative was a prominent method of knowledge transfer utilised by Māori.[1129] Choosing this research method contributes to the retention of our Māori cultural identity and the satisfaction of the main audience prioritised in this thesis (i.e. whānau and hapū of Waiorongomai).[1130] Narratives written by myself, along with oral interviews within this thesis, highlight the enormous support and guidance by local whānau and hapū. The comprehensive narrative of the Lake Waiorongomai restoration project (to date) outlined in this thesis is a contribution for future generations and an important taonga for whānau, hapū and iwi. However, narrative is more than just story telling in an indigenous context, it is an active process of story creation that is contributed to at a community level. One of the roles of this doctoral research endeavour has been to facilitate the co-creation of a restoration narrative. In Māori cultural terms at least, this would be considered as a contribution to mātauranga Māori and whānau Māori (cultural) survival.

6.3.8 Ecological monitoring

The baseline ecological monitoring for the Lake Waiorongomai restoration project could be considered a form of community-based monitoring[1131]. As part of our

[1129] Durie, A., 2001, Te Rērenga o te rā: autonomy and identity: Māori educational aspirations, p. i.
[1130] Target audiences are described in Chapter 4 (Sub-section 4.1.5).
[1131] Community-based monitoring is the community participation in monitoring programs (e.g. ecological) that can be adapted to local social, biological, political, economic and geographic situations. Ortega- Álvarez, R., *et al.,* 2017, Community-based monitoring and protected areas: Towards an inclusive model, pp. 202 & 206.

holistic approach, multiple species were sampled with monitoring conducted by whānau, hapū and iwi members, particularly for eels, fish, water and macroinvertebrates. Further species monitoring was conducted by community members approved by the kaitiaki team members for birds and plants. These are all reported upon in Chapter 7.

The ecological monitoring conducted at Lake Waiorongomai provided opportunities for knowledge development with whānau and hapū, as well as for students attending local learning organisations (Figure 6.3.8). Another aspect that provided opportunities for enhanced whānau involvement was in observing, recording and reporting on taonga species of birds present. Figure 6.3.9 provides a timeline of monitoring events and those involved in collecting ecological data.

Figure 6.3.8 Ecological monitoring that provided opportunities for knowledge development *(Source: photos taken by Aroha Spinks, 2014-2015)*

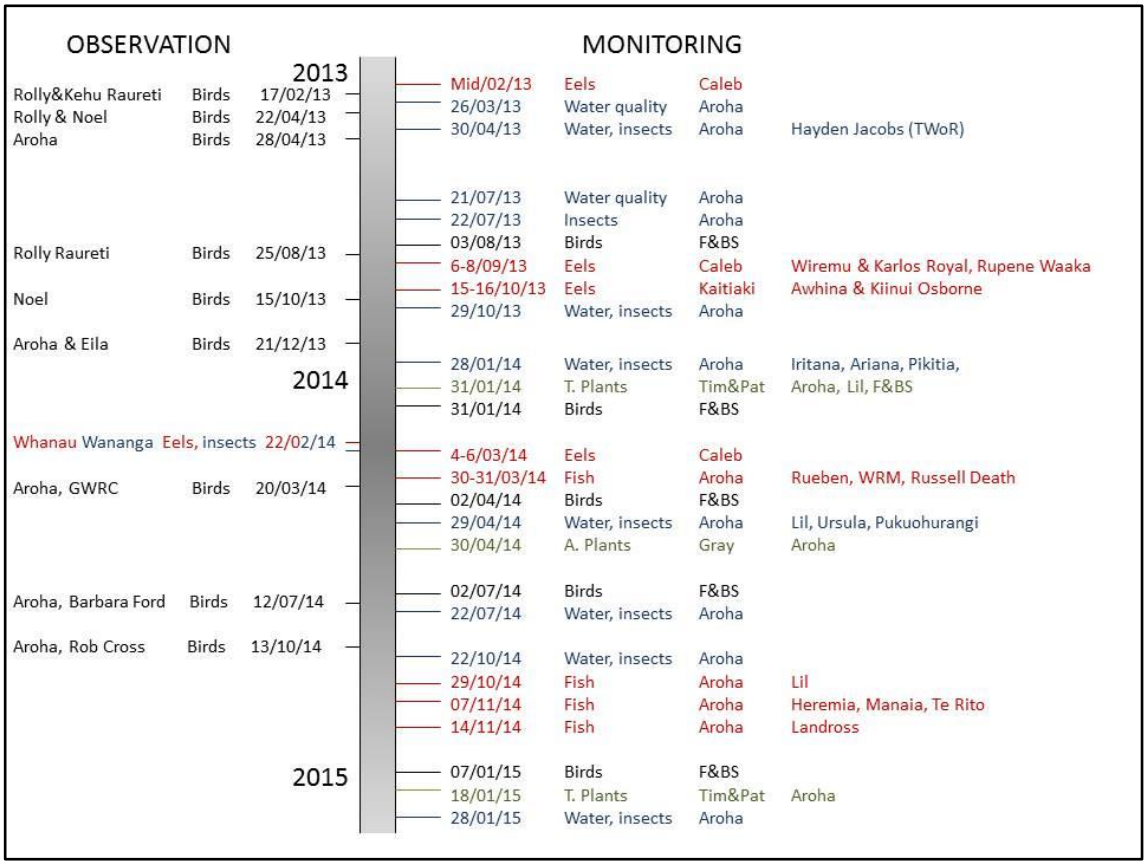


Figure 6.3.9 Ecological species monitoring and observation timeline for Lake Waiorongomai

During the ecological monitoring phase of the restoration project and this doctoral research endeavour, there is a cultural aspect which means adaptive strategies were necessary. Our tikanga is that at certain times women do not to go into mahinga kai areas such as ocean waters, inland waters and vegetable gardens.[1132] As a female there were times that I had to call on interested people or whānau members. Adhering to that tikanga provided an opportunity for me to pass on the knowledge of practical ecological monitoring actions. I became the observer during those hīkoi.

That particular tikanga was not the only reason to take participants out to engage in the monitoring. At times it was for safety reasons, as the land was so boggy you became stuck in the mud and lake bed. Other times it was because of the keen interest in

[1132] Mikaere, A., 2017, The balance destroyed, pp. 20, 42.

whānau members who also wanted to come and observe. Two examples below highlight knowledge development that occurred due to the opportunity to be involved in and observing ecological monitoring activities at Lake Waiorongomai.

My niece Iritana Bennett observed and conducted water and aquatic insect monitoring out at Lake Waiorongomai with me.[1133] From hearing about the project she was inspired to write about the topic for an assignment at her kura (Whakatupuranga Rua Mano). She wished to interview the Waiorongomai 3B2 leasee – Hans Somers. We both approached him and he agreed to an interview, which Iritana video recorded.

My step-daughter Ursula Keswick (a student at the time at Te Wānanga o Raukawa) also accompanied me on a number of hīkoi including water and macroinvertebrate sample collecting. Observing the aquatic insects under the microscope inspired her to draw them. I was simultaneously supporting another iwi project with Ngāti Kauwhata kaitiaki on their aquatic insect monitoring,[1134] so I asked Ursula to help me create a map of the Oroua River for the iwi to show the insects caught at collection sample spots to accompany their report.[1135] Below are some of the aquatic insect figures she drew in Petri dish outlines that represent one of the tools we used to view the samples (Figure 6.3.10). These were also inspired by the hīkoi to Lake Waiorongomai and observations under the microscope, as well as the reference book I was using.[1136]

[1133] 28 January 2014.
[1134] Integrated Freshwater Solutions Project combined stakeholder perspecttives with current science to generate an action plan to protect an enhance the Manawatū Catchment. Research from multiple disciples (natural, social and economic) was undertaken by iwi and hapū, Massey Universtiry, Horizons Regional Council and Crown Research Institutes. It ran from October 2010 to September 2013 and addressed management issues such as: How the river responds to different contaminents; the environmental, cultural, economic and social consequences of good or poor water quality and how different actions potentially impact on river water quality, cultural values, economic growth and social factors. http://www.massey.ac.nz/massey/learning/departments/centres-research/eernz/integrated-freshwater-solutions/about-the-project/about-the-project_home.cfm
[1135] Cribb, M. *et al.*, 2013, Ngā Kaitiaki o Ngāti Kauwhata Oroua River aquatic insect monitoring report. (unpublished report)
[1136] Winterbourn, M., & Gregson, K., 1981, Guide to the aquatic insects of New Zealand.

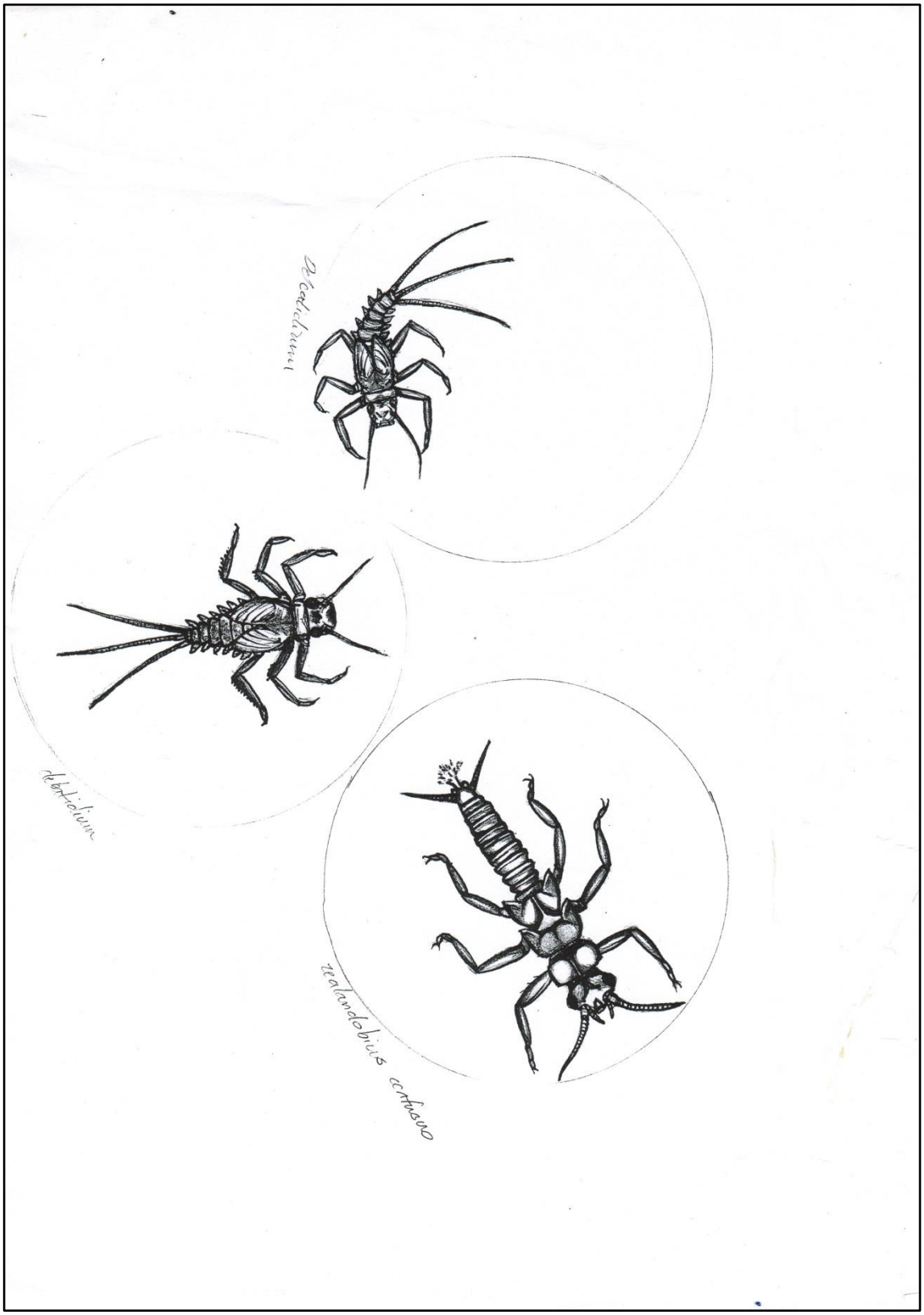


Figure 6.3.10 Aquatic insect sketches (*Source: hand drawn by Ursula Keswick, June 2014*)

The intentional holistic ecological monitoring at Lake Waiorongomai involved organisms that, on reflection we thought were representative of a food web – in ecological terms. The illustration below by A. Mc Intosh is a food web model based on a New Zealand freshwater stream (Figure 6.3.11). Data was collected from these different levels shown in the diagram during the baseline monitoring at Lake Waiorongomai (Chapter 7). Ecologists study dynamic ecological organisation (e.g. population, community, ecosystem, landscape) and seek to better understand the biological, physical and chemical processes as well as the interactions between plants, animals and the non-living environment.[1137] Thus, by identifying the individual organisms and the functions they perform it is possible for our whānau, hapū and iwi to assess wellbeing and causes of change within freshwater ecosystems at Waiorongomai.

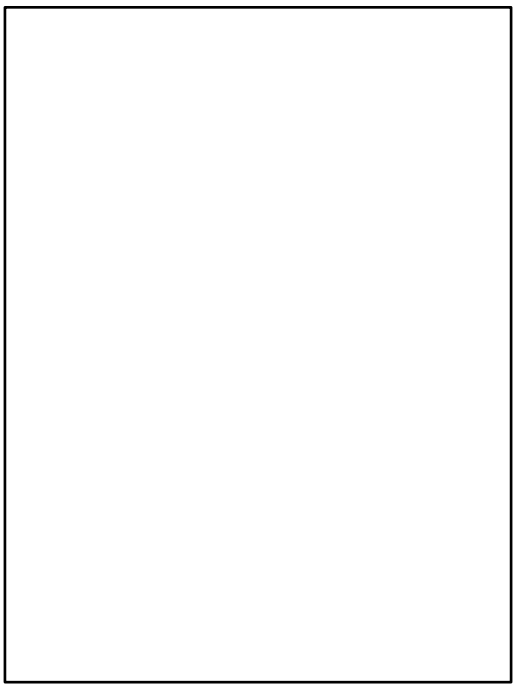


Figure 6.3.11 A model of a New Zealand stream food web. The invertebrates (C-F) are insect larvae. C, D and E eat algae (A), detritus (B), and micro-organisms and other decaying organic matter. They are eaten by predatory invertebrates (F) which are fed on by a variety of fish (G, H and J), and birds (K & I) further up the food chain. The arrows point in the direction of energy flow. (*Source: McIntosh, A., 2000, p. 127*)

[1137] van Roon, M., & Knight, S., 2004, Ecological context of development: New Zealand perspectives, p. 42.

6.4 Reflective tools

Reflection on plans, actions and observations was an important phase of the restoration project and research endeavour. An understanding of tikanga in these projects was important, as was the ability to be guided and respectful of whānau, hapū and kaitiaki decisions and/or recommendations.

6.4.1 Accountability and reporting

Three accountability reports for GWRC were written by this author, reviewed and approved by kaumātua on the Kaitiaki Team. They provided evidence of actions, observations, adaptive strategies and reflections (an example shown in Appendix 12). These accountability reports completed during 2013 to 2015 relate to the relevant funding criteria of GWRC Iwi Department, which was used earlier as an example (Appendix 4). These reports provided GWRC with assurances that funds were being spent well on the purposes applied for and within flexible time limits. Along with other factors, these reports also assisted in further funding that was received for the project from KCDC and DoC.

Another useful tool for iwi and hapū restoration projects and accountability reports is the budget spreadsheet explained earlier that I developed for Taiao Raukawa in my Finance Officer role (Figure 6.1.2). These are not only valuable during the planning stage, but are also particularly useful during the project to maintain an understanding of funds used and funds still available to ensure that overspending or under delivering is less likely. The very simple excel spreadsheet can be easily updated for expenditure as it occurs and used for reporting as well. Providing this feedback to hapū and funders is critical for accountability. For example, Rupene Waaka requested that I include the

proposed budgets as well as the accountability of funding expenditure to date for both LWRP Wānanga.[1138] The main purpose was to provide the hapū with transparency of the funds, recognise those organisations that sourced the funding, as well as indicate the value of whanaungatanga with some of the contractors used.

6.4.2 Powerpoint presentations used as a reflective tool

Powerpoint presentations provided useful reflections on the Lake Waiorongomai restoration project. They were conducted jointly with a whānau member or by myself with required kaitiaki approval. Unlike other doctorate students or academic professionals, it was not appropriate for me to seek out opportunities or conferences to speak about the hapū-led restoration project or my doctoral research endeavour. Individuals that approached me or asked for Lake Waiorongomai to be included in an event with a powerpoint presentation sought kaitiaki approval first. All presentations conducted usually involved some benefit to the whānau and hapū. Other occasions were deemed acceptable by kaitiaki because there was a reciprocal effect of giving back to the audience or facilitators in accordance with our tikanga. Only on a few occasions were opportunities of reciprocity to give forward approved, when they were seen as benefitting iwi and hapū from other regions of New Zealand. The table below provides a summary of presentations I conducted during the doctoral research period and the reasons of appropriateness (Table 6.4.1).

[1138] 22-23 February 2014 and 13 July 2015.

Table 6.4.1 Powerpoint presentations that I conducted on the Lake Waiorongomai restoration project and their appropriateness

Date	Event & Location	Title	Audience & Appropriateness
18/10/12	KCDC Community Fund, Paraparaumu	Restoration of Lake Waiorongomai	KCDC staff, requesting funding for LWRP. Potential direct benefit to hapū
25/11/12	Manaaki Taha Moana Horowhenua case studies wānanga, Kuku	Restoring Coastal lake ecosystems for cultural survival – the proposed case study of Lake Waiorongomai	MTM collaborative team & potential external support organisations. Potential direct benefit to hapū
01/08/13	PhD Confirmation Hui at Taaringaroa, Raukawa Marae, Ōtaki	Lake Waiorongomai Restoration Project proposed PhD support	Whānau and hapū, Massey academic panel. Potential direct benefit to hapū
19/11/13	Whakatupuranga Rua Mano – Rae ki te rae wānanga, Ōtaki	Rae ki te rae - Revitalising Lake Waiorongomai PhD Support	Kura students, whānau. Direct benefit to hapū
29/11/13	Māori and Indigenous Conference, Auckland	Manaaki Taha Moana – The ecological revitalisation of Lake Waiorongomai by whānau, hapū and iwi	Māori and indigenous PhD students and researchers. Benefit to other iwi (one whānau PhD candidate present)
22/02/14	Lake Waiorongomai Restoration Project Wananga, Raukawa Marae, Ōtaki	Lake Waiorongomai Restoration Project	Whānau and hapū direct benefit
23/02/14		Annual Plan for 2014, Raukawa Marae, Ōtaki	
		Ecological monitoring	
		Final workshop	
06/03/14	MTM Landscape Architecture Students, Raukawa Marae, Ōtaki	Lake Waiorongomai Restoration Project	Whānau and hapū direct benefit
25/09/14	Te Taarere a Taawhaki Seminar Series, Waikato-Tainui College for Research and Development, Ngaruawahia	The ecological revitalisation of Lake Waiorongomai by whānau, hapū and iwi	Tikanga – giving back to Tainui iwi for supporting me with doctoral scholarships. Inspiring another iwi
23/02/15	MTM Symposium, Massey University, Wellington	Lake Waiorongomai Restoration Project. By Nick Albert (Kaumātua), Aroha Spinks and Michael Urlich (GWRC)	Tikanga – giving back to MTM for their support
13/07/15	Lake Waiorongomai Restoration Project Wānanga, Taaringaroa, Raukawa Marae, Ōtaki	Lake Waiorongomai Restoration Project Reflection of Actions	Whānau and hapū direct benefit
		Lake Waiorongomai PhD Research	
		Waiorongomai Wānanga Workshop	

14/07/15	Kāpunipuni hui at Whakatupuranga Rua Mano	Lake Waiorongomai Restoration Project. By Aroha Spinks and Iritana Bennett (WRM student, iwi member)	Whānau and hapū direct benefit, parents learn what the kids are doing at LW
20/07/15	Forest and Bird Society Horowhenua Meeting in Levin	Lake Waiorongomai Restoration Project Reflection of Actions	Tikanga – giving back to Forest and Bird Society for their support monitoring birds at LW
		Lake Waiorongomai PhD Research	
21/02/17	Te Wānanga o Raukawa, Pūtaiao Students, Ngā Purapura, Ōtaki	Lake Waiorongomai Restoration Project	Tikanga – supporting a local iwi learning institute and inspiring other iwi. 5 Hapū students

6.4.3 Reflection on learning from mistakes

Even the best plans can also go awry and in a project of this scale researchers need to be prepared for the fact that things will go wrong. As mentioned earlier Māori in general enjoy humour and our tikanga in many circumstances encourages humbleness. Laughing at our own mistakes can be a form of expressing humbleness. During the Lake Waiorongomai restoration project the whānau would mention that an event that occurred might end up in this doctoral thesis. From their insinuations they have and so in this section I casually refer to them as 'bloopers'.

Not all blooper events can be recorded as there were many wet gumboots, falling into water, stepping in a variety of poos, people getting stuck in the mud and vehicles wedged in the mud. But then, there were a few major events such as the new plastic culvert caving in with the first vehicle crossing it! Figure 5.3.11 shows the scene. These were all opportunities to learn and to do things better next time (Figure 6.4.1).

Figure 6.4.1 Learning opportunities (*Source: taken by Aroha Spinks, dates remain undeclared*)

6.5 A comparison and contrast of kaupapa Māori research and action research approaches to transformative change

This chapter attests that kaupapa Māori research methods can achieve transformative restoration actions that fulfil positive ecosystem wellbeing and the aspirations of whānau and hapū, in a culturally appropriate approach similar to that of action research. Many examples provided in sections 6.1-6.4 illustrate how this case study aligns with action research in some respects and differs in others. A key point is that a kaupapa Māori approach towards the restoration of this whānau Māori ecosystem succeeded in establishing the restoration area at Lake Waiorongomai when previous attempts had failed. In this final sub-section, I seek to reflect on why a kaupapa Māori approach was both appropriate and necessary to the success of this project. To achieve

this I pose and explore these questions, "What might have happened if in the role of project researcher had I, only used an action research approach? Would this project have produced the transformative outcomes that are elaborated in this chapter and if not, why not?" The analysis contained within this final sub-section of Chapter 6 seeks to shed light on these questions.

6.5.1 Similarities between action research and kaupapa Māori as expressed in the Lake Waiorongomai restoration project

The Lake Waiorongomai restoration project shares a number of similarities with an action research project. This conclusion is consistent with the analysis of kaupapa Māori and action research theory presented in Chapter 4 of this thesis. Theoretical and method similarity and differences are summarised in Table 4.4.1. Chapters 5 and 6 provide detailed narratives that seek to show how Māori cultural values (i.e. kaupapa and tikanga) played a central role in producing the transformative outcomes desired for this project. Specifically, Chapter 5 focuses on the expression of kaupapa and tikanga by whānau, hapū and community participants. Chapter 6 focuses on the expression of kaupapa and tikanga associated with my own research, organisational, communication, relationship building and reciprocity responsibilities as whānau member, hapū member, iwi researcher and kaupapa Māori researcher.

The timelines portrayed in Chapter 5 (Figures 5.0.1 and 5.0.2) and details of restoration and research endeavours outlined in Chapters 5-7 have been synthesised into illustrations I prepared for this section. They are based on the five characteristic steps of an action research cycle: (i) identify; (ii) plan; (iii) action; (iv) observe; and (v) reflect. I created the first reflective illustration (Figure 6.5.1) to show the similarities

that exist between the expression of kaupapa Māori in this research project and an action research cycle.

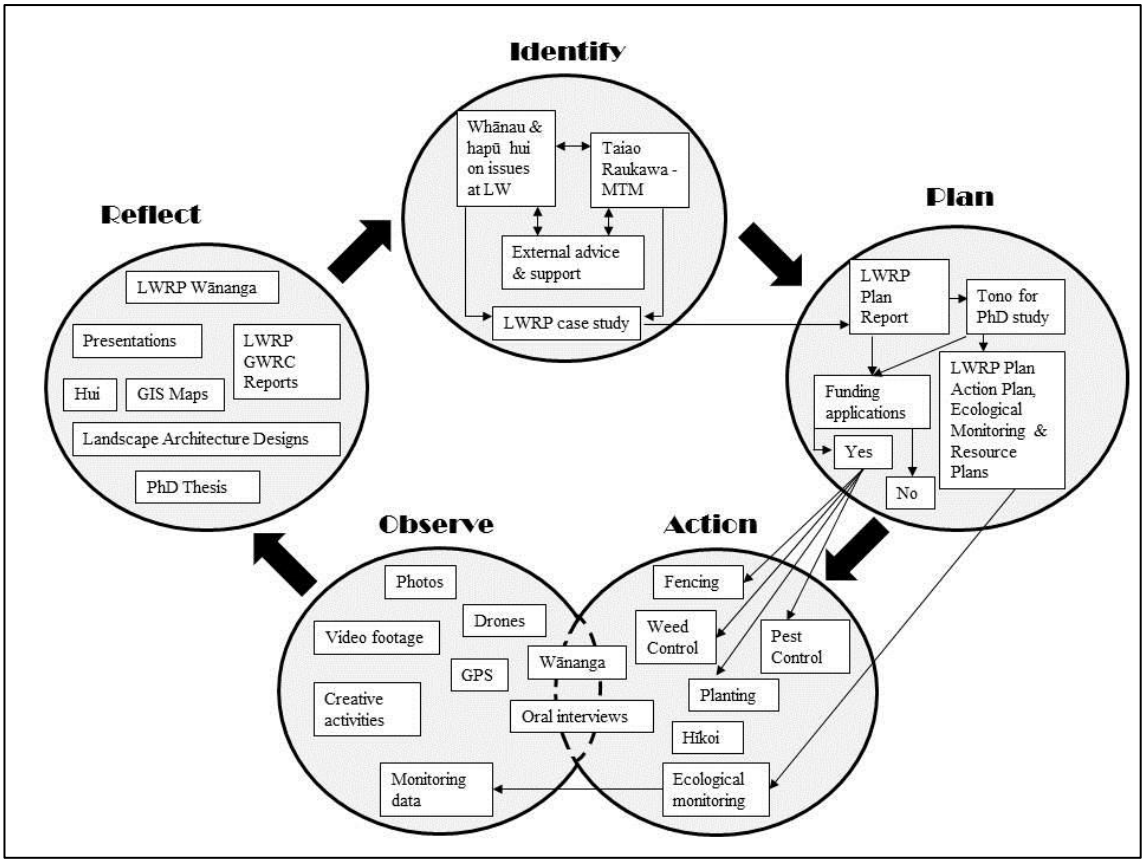


Figure 6.5.1 An illustration of the overall action research cycle for the Lake Waiorongomai restoration project and doctoral research endeavour

To create Figure 6.5.1, I made a large excel table that contains a detailed list of all the events that I was involved in that collectively comprised the Lake Waiorongomai restoration project (Appendix 13). Next, I went through this list and coded each event as potentially contributing to each of the five characteristic steps of the action research cycle. Finally, I sorted the Excel worksheet table (Appendix 13) based on the use of the action research steps as a key and then used the resultant order of events to create Figure 6.5.1. While Figure 6.5.1 is an abstracted version of this initial excel worksheet, it provides: (i) an overview of all key project events and methods, (ii) as seen through an action research lens.

It is also important to note that the activities included in each of the action research steps depicted in Figure 6.5.1 can also be cross-related to the various narrative sections of this chapter and indeed Chapter 5. For the convenience of the reader, the narrative information outlined in each of the sub-sections of this chapter[1139] is listed in Table 6.5.1 in a way that shows this its relationship to each of the action research cycle steps depicted in Figure 6.5.1.

Table 6.5.1 Action research cycle steps depicted in Figure 6.5.1 aligned to relevant sub-sections of this thesis

Action research step	Description	Thesis reference
Identify (issues & solutions)	Whānau and hapū hui on concerns and issues for Lake Waiorongomai wellbeing. Sought external advice and support.	6.1 & 3.2
	Taiao Raukawa – MTM research programme	6.1 & 1.2
	Lake Waiorongomai restoration project case study	6.1 & 1.4
	Clear communication	6.1.1
Plan	Lake Waiorongomai restoration project plan report	Within 5.3.1
	Tono for PhD study by Aroha	6.1.1 & 5.3.1
	Action, ecological monitoring & monitoring resource plans	Appendices 5,6,7
	Funding applications	6.1.2
Action	Fencing	6.2.1
	Pest control	6.2.3
	Weed control	6.2.4
	Planting	6.2.5
	Ecological field data collection	6.3.8
Observe	Photographic footage	6.3.1
	Drone footage	6.3.2
	Film footage	6.3.3
	GPS	6.1.5 & 6.2.2
	Oral interviews	6.3.4
	Hīkoi	6.3.6
	Monitoring data observations in the field	6.3.8 & 7
	Creative artistic activities	6.1.4
Reflect	Wānanga	6.3.5
	Hui	6.3.6
	Narrative	6.3.7 & 5.2
	Accountability reports	6.4.1
	Presentations	6.4.2
	GIS Maps	6.1.5 & 6.2.2
	Landscape architecture designs	6.1.4
	Doctoral thesis	1-8

[1139] As well as other chapters and appendices if deemed appropriate.

An interesting characteristic of Figure 6.5.1 is that while this project was not started with the intention of carefully following an action research stepwise method and logic, it is possible to group subsequent project events into a framework of this kind. This result suggests that there is a very real sense in which this whānau and hapū mediated project followed a 'self-initiated' pathway that is not dissimilar to an action research model based on 5 key steps (i.e. identify, plan, action, observe and reflect). This finding is consistent with the comparison of selected theory and method characteristics of kaupapa Māori research and action research approaches contained in Table 4.4.1. Thus, the trajectory of the Lake Waiorongomai restoration project seems to be consistent with what action research theory predicts. However, there are also a number of important differences.

6.5.2 Differences between kaupapa Māori and action research as expressed in the Lake Waiorongomai restoration project

Once again, it is possible to reflect on both theoretical and practice differences between the kaupapa Māori expressed in this project and an action research approach. Table 4.4.1 shows that there are a number of theoretical differences. For the convenience of the reader, I have isolated the differences contained in Table 4.4.1 and listed them in Table 6.5.2. These differences are then considered with reference to the practical applications of a kaupapa Māori research approach and the narratives within this thesis.

Table 6.5.2 A list of selected key attribute differences between kaupapa Māori and action research approaches derived from Table 4.4.1

No.	Attributes	Kaupapa Māori	Action research	Same?
1	Action research method	Kaupapa and tikanga driven	A series of commitments	No
2	Applied and social	The expression of kaupapa is	Yes, methods differ in	No

	methods differ	relevant to both	these 2 domains	
3	Collaborative partnership	Generally hapū preferenced and led	Yes	No
4	Defining a problem	Not irrelevant, but manaakitanga is always first	First step in a cycle of action	No
5	Forms of social organisation	Socially mediated and woven together by rangatira[1140]	An attempt to create learning that is of the people, for and by the people	No
6	Dialectical critique	Generally not mana-enhancing	Yes, an extension of action science	No
7	Domains	Tikanga Māori	Business, education, family life, community	No
8	Driven by a vision for social transformation	Yes initial focus. Now may include tangata and whenua	Yes	No
9	Efficiency oriented	Efficiency aspirations are provided by hapū as they deem appropriate	Can be, depending on the problem context	No
10	Exploratory engagement	Can be but generally grounded	Yes	No
11	Holistic	Yes	No	No
12	Integrates research and action	The development of kōrero Māori always exists in situ	Yes	No
13	Key mechanism of social change	Action and dialogue	Action and reflection	No
14	Planning	Hapū-mediated	Community-mediated	No
15	Political and decolonising motivations	Yes one strand of kaupapa Māori research specifically targets these foci	Can be used but generally it has a much wider scope	No
16	Practical problem solving oriented	Value-based (e.g reclaim, reframe, re-instate)	Yes (i.e. action science)	No
17	Publishing determined by participants	Yes usually	No usually the researcher or research team	No
18	Reflection stage is critical	Based on alignment to kaupapa and tikanga	Focused on plan completion and emerging best practice	No
19	Reflexive critique	Generally not mana-enhancing	Yes, a search for superior explanation	No
20	Research data and intellectual property owned by participants	Yes usually	No usually the researcher or research team	No
21	Researcher a participant	Yes, often whānau, hapū or iwi connections	Can be. Participants and researcher involved in all steps	No
22	Spiritual, social and psychological aspects	Yes	Spiritual aspects not usually included but other 2 yes	No
23	Theory-practice transformation	A dialogue between theory and practice co-exist	Theory suggests that transformation is possible, work in progress	No
24	To improve practice rather than knowledge	Expression of kaupapa/tikanga is always central	Yes	No
25	Used as a trouble	Generally not	In organisations (e.g.	No

[1140] Chief, high ranking leader.

	shooting method		low morale)	
26	Worldview	Based on Māori philosophy	Based on western philosophy	No

Can the theoretical and practice differences outlined in Table 6.5.2 be found in the Lake Waiorongomai restoration project? The narrative results and methods outlined in Chapters 5 and 6 of this thesis would seem to be consistent with the differences listed in Table 6.5.2. The following reflections were co-constructed with whānau member Anthony Cole and seek to illustrate this point by commenting on the relevance of each of the differences listed in Table 6.5.2 to the Lake Waiorongomai restoration project.

First, the Lake Waiorongomai restoration project was value-based[1141] rather than being managed according to subsequent community and stakeholder commitments (Table 6.5.2, row 1). Furthermore, the expression of kaupapa and tikanga existed in both applied and social domains[1142] whereas different methods are recommended for these domains in an action research context (Table 6.5.2, row 2). While action research is based on a researcher/community partnership (Table 6.5.2, row 7) that is basically equal in terms of decision-making power and influence over the project, the Lake Waiorongomai restoration project was clearly tikanga Māori-led[1143] (Table 6.5.2, row 7) as consistent with kaupapa Māori research (Table 6.5.2, row 3). Action research involves the democratisation of research whereas in the Lake Waiorongomai restoration project, key decisions and guidance on the kaupapa and tikanga was referred to rangatira (e.g. kaumātua, trustees and the kaitiaki team)[1144] (Table 6.5.2, row 5). In action research, dialectical critique would be considered appropriate and necessary, however in the domain of kaupapa Māori research this would likely be viewed as a

[1141] Section 5.1 - Rangatiratanga, wairuatanga, kaitiakitanga, ūkaipōtanga, pūkengatanga, kotahitanga.
[1142] Chapter 5, Section 5.3.
[1143] Chapter 5, Sub-section 5.3.1.
[1144] Chapter 5, Sub-section 5.3.1 and Chapter 6, Sub-section 6.1.1.

mana diminishing action (Table 6.5.2, row 6). As an example, the use of historical emergence literature reviews used in this thesis in contrast to critical literature reviews.[1145] While as action research approaches are driven by a vision for social transformation and efficiency outcomes (Table 6.5.2, row 8), the Lake Waiorongomai restoration project was clearly aligned to holistic[1146] (Table 6.5.2, row 11) ecological[1147] and social transformation[1148] (Table 6.5.2, row 7) while efficiency outcomes were not prioritised above Māori cultural values[1149] (Table 6.5.2, row 8).

While the Lake Waiorongomai restoration project had elements of exploratory engagement it was grounded in the expression of Māori cultural values or actions (Table 6.5.2, row 11) rather than theory (Table 6.5.2, row 10).[1150] Likewise, in action research 'action and reflection' are the two distinguishing characteristics of an action research cycle. By contrast, the expression of kaupapa and tikanga in the Lake Waiorongomai restoration project was socially mediated through the central role of collective dialogue (Table 6.5.2, row 13). An action research community plays a role in planning a project with a broad range of community stakeholders, regulatory officials and scientists. By contrast, the Lake Waiorongomai restoration project was simply 'hapū-mediated' (Table 6.5.2, row 14).[1151]

An action research project can have political activism goals, but generally does not concern itself with decolonising objectives. By contrast, the Lake Waiorongomai restoration project makes a contribution to decolonising discourse and local government activities that are not of particular concern to an action research project (Table 6.5.2,

[1145] Chapter 4, Sections 4.2 and 4.3.
[1146] Chapter 5, Section 5.5.
[1147] Chapter 5, Sub-section 5.3.3, Chapter 6, Sub-section 6.3.8 and Chapter 7.
[1148] Chapter 5, Sections 5.2 and 5.4, Sub-sections 5.3.4, 5.3.5 and 5.3.6.
[1149] Chapter 5, Section 5.3.
[1150] Chapters 5 and 6.
[1151] Chapter 4, Sub-section 4.1.3 and Chapter 6, Sub-section 6.1.1.

row 15). Action research projects are known to focus on practical problem solving but do not need to pay attention to the reclaiming, reframing and re-instating of knowledge as a basis for successful project completion (Table 6.5.2, row 16). In action research the creation and publishing theory or best practice is considered to be a central objective of research team members (Table 6.5.2, row 17). In the Lake Waiorongomai restoration project publishing and academic outcomes have been guided and limited by whānau and hapū (Table 6.5.2, row 17).[1152]

In the action research cycle, the reflection step (Table 6.5.2, row 18) is considered to be critical as a source of 'reflexive critique' (Table 6.5.2, row 19) of existing best practice. While it is possible to identify a reflection stage in the Lake Waiorongomai restoration project[1153] (Table 6.5.2, row 18) the use of critique to evaluate the expression of kawa, kaupapa and tikanga would likely be considered a mana diminishing contribution (Table 6.5.2, row 19). In the Lake Waiorongomai restoration project, all project related data and IP are owned by hapū[1154] whereas in action research they remain the property of the researcher/s (Table 6.5.2, row 20). In the Lake Waiorongomai restoration project, I carry a dual responsibility as hapū and researcher (Table 6.5.2, row 21). This responsibility extends into the domains of spiritual, social and psychological wellbeing (Table 6.5.2, row 21). In action research, the researcher/s are generally professional scientists (Table 6.5.2, row 21) who may or may not be interested or even capable of contributing to the spiritual, social and psychological wellbeing of the project (Table 6.5.2, row 22). Action research projects face the challenge of moving from action research theory to application (Table 6.5.2, row 23) in ways that improve existing best practice (Table 6.5.2, row 24). By contrast, the Lake Waiorongomai restoration project

[1152] Chapter 4, Sub-section 4.1.3.
[1153] Chapter 6, Section 6.4 and Figure 6.5.1.
[1154] Chapter 5, Sub-section 5.3.1.

maintains a constant dialogue between theory and practice[1155] (Table 6.5.2, row 23) while seeking to reclaim, reframe and reinstate the expression of kaupapa and tikanga[1156] (Table 6.5.2, row 24). Finally, action research is a western scientific research tool or framework (Table 6.5.2, row 26) that is applied in a range of problem contexts including 'trouble shooting' (Table 6.5.2, row 25). By contrast, the Lake Waiorongomai restoration project is an expression of a Māori worldview[1157] (Table 6.5.2, row 26) that is generally not applied in other problem domains in a way that employs a systematic approach before undertaking research (Table 6.5.2, row 26).

A simple way to summarise all of the differences (described in this section) between the kaupapa Māori research methods (kaupapa and tikanga) used in the Lake Waiorongomai restoration project and action research cycle would be to say that action research was not ideally suited to this case study. Perhaps action research is not well-matched to application outside of its own 'Western' economic, social, ecological and cultural context. This point appears to be an area of opportunity in the current action research literature. As it is based on an implicit assumption that one research tool (i.e. action research) will fit all cultural problem contexts. The findings of the Lake Waiorongomai restoration project outlined in this thesis suggests that there would be benefit in revising the validity of this assumption.

6.5.3 A comparison and contrast of complexity in kaupapa Māori and action research approaches

It is possible to use both published theory (i.e. Sections 4.2 and 4.3) and experiences as documented in Chapters 5 and 6 to explore the similarities and differences between the Lake Waiorongomai restoration project and action research.

[1155] Chapter 6.
[1156] Chapter 5, Sub-section 5.5.1.
[1157] Chapter 2.

However, a limitation of the contrast described in Sub-section 6.5.2 is that it fails to focus attention on the relative complexity of both kaupapa Māori and action research approaches. An emerging trend in recent published literature on action research draws attention to the fact that western scientific research projects of this kind do not always follow the simplified action research cycle pathway. Authors such as McNiff, Whitehead and Townsend presented case study evidence of more complex action research structures (e.g. Figures 4.3.4 and 4.3.5).[1158]

It is generally recognised that kaupapa Māori research projects are also complex.[1159] However, the nature and extent of this complexity is generally not well understood or appreciated by western scientists. It is possible to use experiences from the Lake Waiorongomai restoration project to illustrate this point. For example, the pathway followed by fencing activities in the Lake Waiorongomai restoration project reveals the existence of nested complexity. In Figure 6.5.1, the need to identify priorities for the Lake Waiorongomai restoration project is depicted by a single event or step (i.e. identify). However, such simplification misrepresents a far more complex reality that I have attempted to depict in Figure 6.5.2. There are a couple of important points that need to be explained about Figure 6.5.2. First, while the chain of events depicted could not be said to be cyclical or fully random, it is perhaps more appropriate to say that they are a direct result of a hapū-mediated engagement process. Second, some of the events depicted in Figure 6.5.2 can be classified as steps involving identification (I), planning activities (P), reflection activities (R) and the sole expression of tikanga (T). Thus, there is a very real sense in which parts of the action research cycle (entire) are nested in the 'identify' step of Figure 6.5.2 and related (refer to direction of linking arrows) as a hapū-mediated sequence of events.

[1158] Whitehead & McNiff, 2006; Townsend, 2013.
[1159] Bishop, 2005; Rāwiri, 2012.

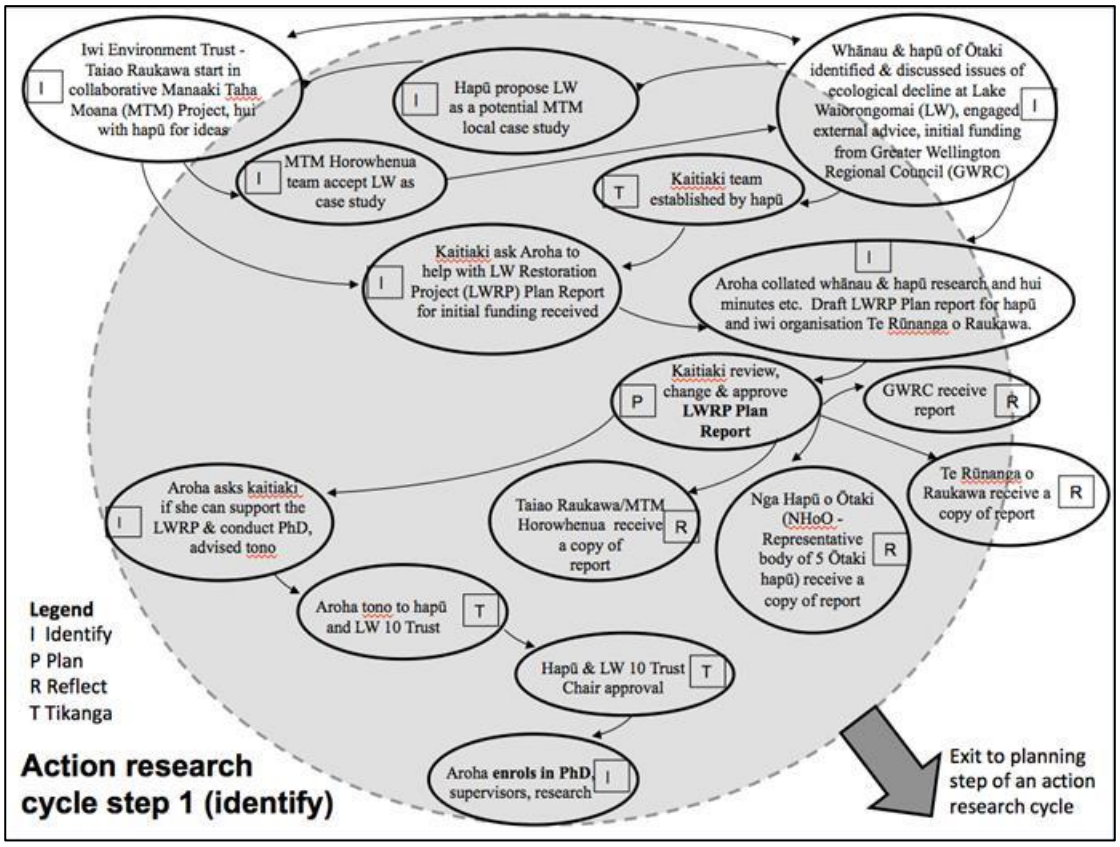


Figure 6.5.2 An illustration of the 'identify' step of the action research cycle shown in Figure 6.5.1 that depicts the complex events pathways associated with identify activities

In Figure 6.5.1, the need for immediate fencing of Lake Waiorongomai was identified as a solution (plan) for keeping cattle out of the lake and prevention of their grazing on the remaining native vegetation around the lake. This urgent 'fencing plan' priority was simply illustrated in Figure 6.5.1 as represented within the 'Lake Waiorongomai Restoration Project (LWRP) Plan Report'. This misrepresents the far more complex reality that I depict in Figures 6.5.3 and 6.5.4.

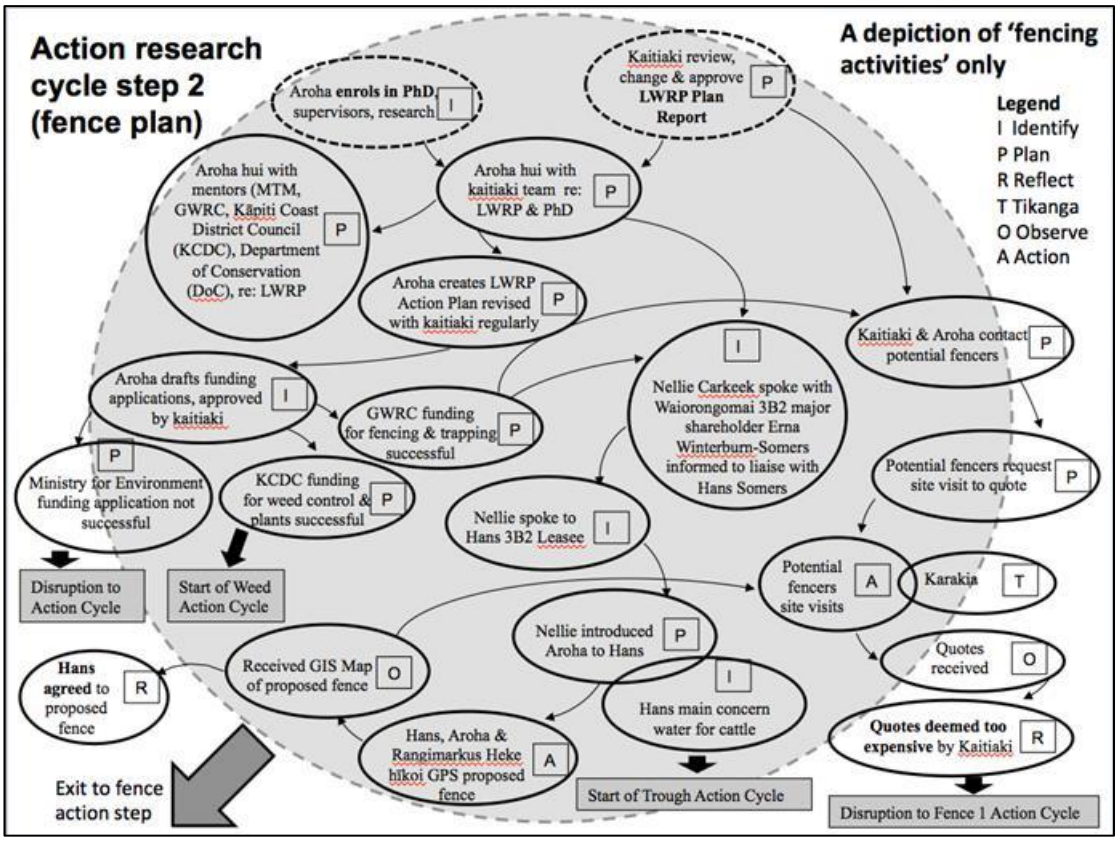


Figure 6.5.3 An illustration of the 'plan' step of the action research cycle shown in Figure 6.5.1 that depicts the complex events pathway associated with the creation of the fence plan. This planning process links (bottom left hand corner) to fence actions numbers 1 – 3 (Figure 6.5.4)

Figure 6.5.3 shows the planning event pathways that were required in order to formulate an initial plan for the fencing of the entire Lake Waiorongomai block[1160]. Similarly to Figure 6.5.2, the events depicted in Figure 6.5.3 are a direct result of a hapū-mediated engagement process. Once again events within this fencing 'plan' step can be classified as identify (I), plan (P), action (A), observe (O), reflect (R) and tikanga (T). Thus, there is a very real sense in which parts of the action research cycle (entire) are nested in this fencing 'plan' step of Figure 6.5.3 and related (refer to direction of linking arrows) as a hapū-mediated sequence of events. As Figure 6.5.3 the Lake Waiorongomai restoration project plan to fence the entire block was deemed too expensive and thus for funding

[1160] Waiorongomai Block 10.

reasons the plan was revised. A second planning stage to fence the lake only (Phase 1) commenced which only included half of the Waiorongomai Block 10 (Figure 6.5.4).

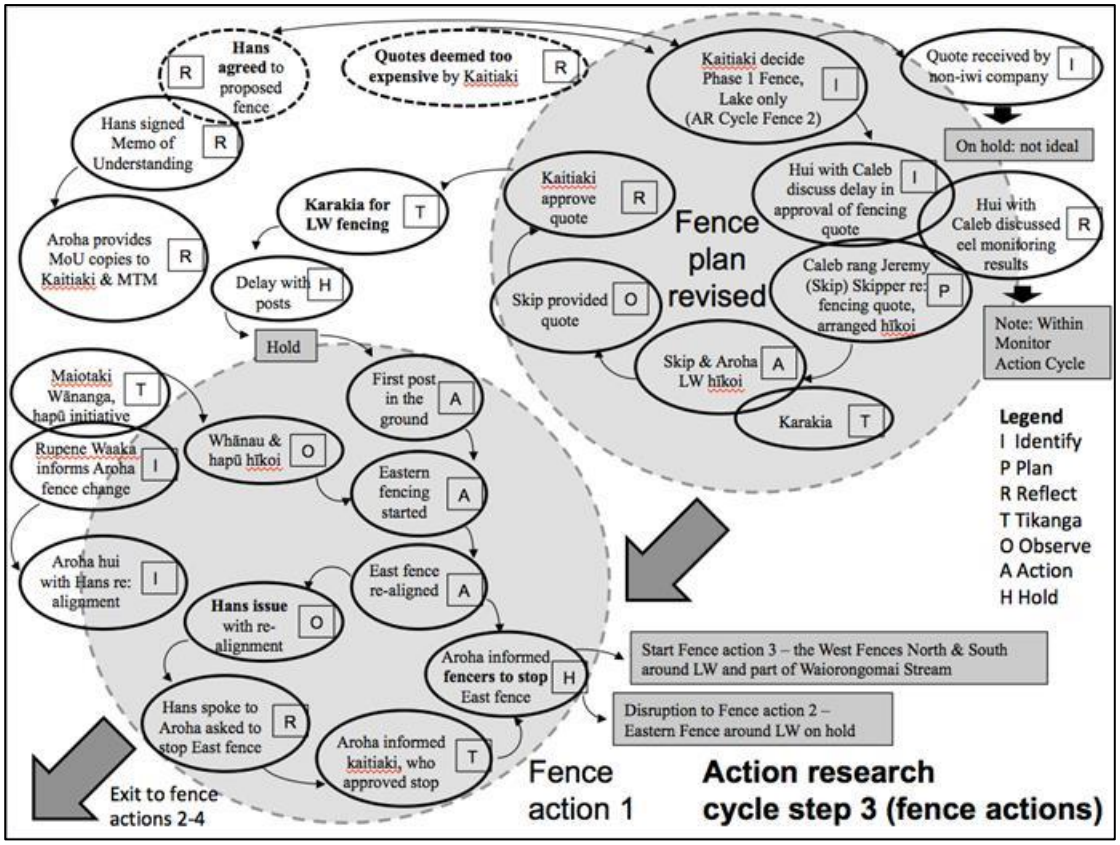


Figure 6.5.4 An illustration of the revised fence 'plan' step and 'action' step of the action research cycle shown in Figure 6.5.1 that depicts complex events. This planning process links (bottom left hand corner) to fence actions numbers 2 – 4 (Figure 6.5.5)

Actions associated with the implementation (i.e. actions) of the revised fencing plan depicted in Figure 6.5.4 are also far more complex than could be described by the action expression 'build the fence'. The second fencing plan commenced into action after the important cultural event of karakia (as seen in Figure 6.5.4). The implementation of the revised fence plan went through at least four fencing action stages, as the fencing activities was halted or adapted (e.g. leasee concerns about alignment, culvert requirements, funding limitations). Figure 6.5.5 shows the fencing actions (2 – 4), as disruptions and adaptive strategies continued in the Phase 1 fencing of only the lake half

of Waiorongomai Block 10. The events within Figure 6.5.5 show the permanent fence lines around Lake Waiorongomai (Phase 1) almost completed with two temporary fencing areas surrounding two culvert areas.

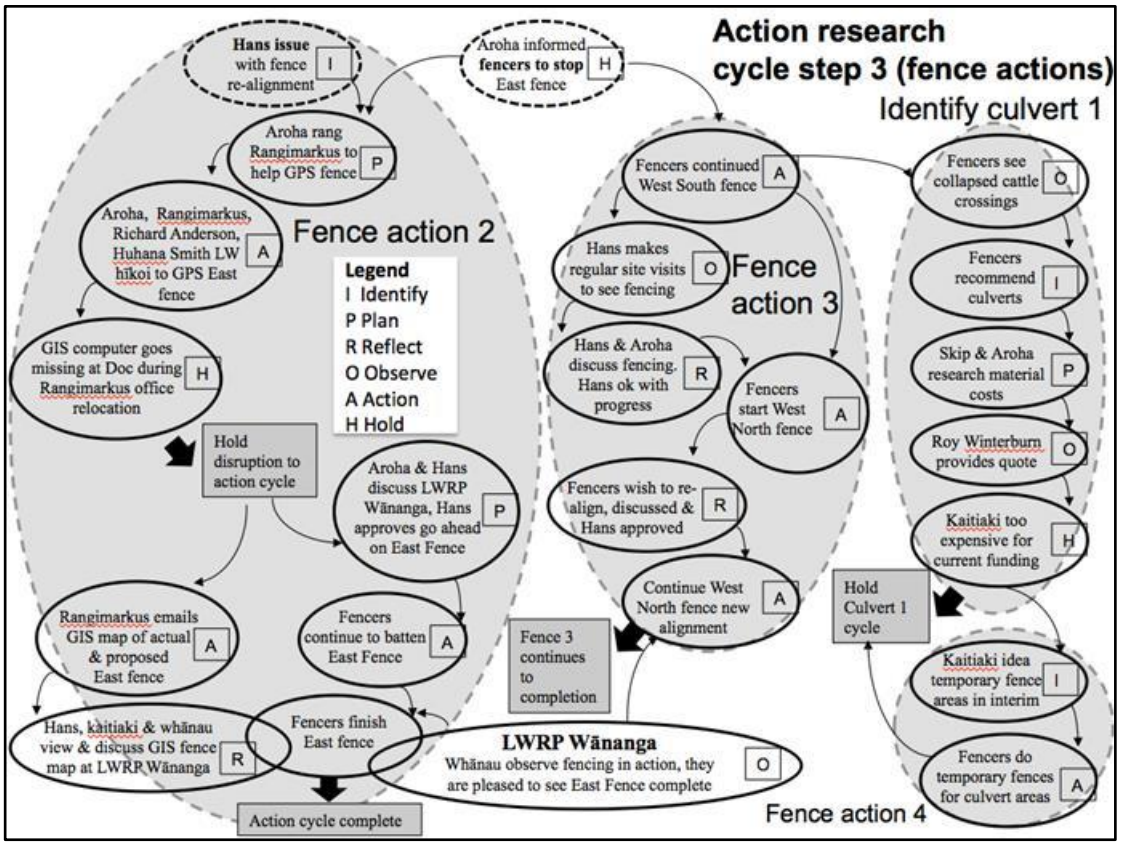


Figure 6.5.5 An illustration of the fencing 'action' steps of the action research cycle shown in Figure 6.5.1 that depicts the complex events associated with fencing during the Lake Waiorongomai restoration project

Figures 6.5.2 - 6.5.5 attempt to visually show that the Lake Waiorongomai project involved a level of event pathways, tikanga and activities that were complex and inconsistent with the generalised action cycle model (Figures 4.3.1 and 6.5.1). The complexity dimension of kaupapa Māori research tends to be poorly understood by western scientists. In a western science action research project is it 'generally' not necessary to deal with the complexities associated with a kaupapa Māori research activity. In the case of Lake Waiorongomai, the fencing events shown in Figures 6.5.3-

6.5.5 introduce hapū-mediated and tikanga pathways and these are unlikely to be experienced in an action research project dominantly guided by individual property rights and research 'expert' leadership. Added to the complexity not shown within Figures 6.5.3-5 were the other restoration activities (e.g. pest and weed control, planting) and doctoral research (e.g. wānanga, ecological monitoring) that were also occurring concurrently.

Kaupapa Māori research projects of this kind must grapple with numerous, interconnected layers of complexity associated with collective property rights, hapū-mediation, iwi politics, a holistic orientation, spiritual elements, cross-cultural communication, resource sharing and the appropriate expression of local kaupapa and tikanga. While I have drawn on learnings from action research, in conclusion without the dimensions of Māori cultural complexity and the patient attention to detail needed to ensure their inclusion, the potential of a project of this kind to deliver transformative outcomes and positive results would be limited.

The analysis contained within this final section (6.5) of Chapter 6 supports two main conclusions. First, while there are similarities between the kaupapa Māori methods used in this project and an action research approach, there are also distinctive differences. Second, the current state of theory and practice in action research is not wrong, but incomplete as a basis for the successful use of this method alone in an indigenous cultural context (e.g. kaupapa Māori). This is not a criticism of action research, but rather an insight that researchers in this area of disciplinary specialisation can use to enhance their current theory and practice. This doctoral thesis is intended to contribute positively to providing a cultural perspective to action research overall.

Chapter 7 Waiorongomai ecological baseline monitoring

Kahore e kitea te huanui ki te kai, te huanui te wahie

Do not set out only to gather kai, gather the firewood to sustain you.

This chapter provides an overview of the ecological wellbeing within Lake Waiorongomai and its surrounding wetland environment. This research outcome has been achieved by using western scientific research methods to provide a baseline understanding of the current state of the environment at this location in relation to the aspirations of whānau[1161], hapū[1162] and iwi[1163]. The ecological research and collection of wellbeing data provided opportunities to build the monitoring skills and understanding of participating whānau, hapū, iwi members and students from kura kaupapa Māori (Whakatupuranga Rua Mano and Te Rito)[1164] and Te Wānanga o Raukawa[1165] students. The combined contribution of ecological monitoring by whānau and hapū scientists as well as community in the Lake Waiorongomai restoration project

[1161] Family, extended family.
[1162] Sub-tribe, clan.
[1163] Tribe, nation.
[1164] Māori learning schools (Te Kura-ā-Iwi o Whakatupuranga Rua Mano and Te Kura Kaupapa Māori o Te Rito)
[1165] A local whare wānanga: meaning a Māori tertiary institute.

and doctoral research endeavour is an example of community-based monitoring[1166] in a Māori cultural context.[1167]

Monitoring activities targeted species of cultural importance to the whānau and hapū of Lake Waiorongomai. These valued species included historic customary food sources from this locale as well as other resources such as plant materials. The key scientific findings of these monitoring activities included the rediscovery of endangered or threatened species such as longfin and shortfin eels[1168], bittern[1169], dab-chicks[1170], grey ducks[1171], royal spoonbill[1172], white heron[1173], button daisy[1174], swamp buttercup[1175] and fennel-leaved pond weed[1176]. Some species (e.g., whitebait[1177] and watercress[1178]) returned during the baseline monitoring provided some initial evidence of the effectiveness of our restoration activities. This is outlined in greater detail in the remainder of this chapter, along with a detailed explanation of monitoring methods and results.

[1166] Community-based monitoring is the community participation in monitoring programs (e.g. ecological) that can be adapted to local social, biological, political, economic and geographic situations. Ortega- Álvarez, R., *et al.*, 2017, pp. 202 & 206.
[1167] "The application of an indigenous community-based monitoring system in conjunction with a scientific-based approach therefore is likely to be highly informative over time. It also gives indigenous communities an important stake in the interpretation and decision-making processes, ensuring that biodiversity and cultural values relevant to their people are protected and maintained." In Lyver, P., *et al.*, 2017, An indigenous community-based monitoring system for assessing forest health in New Zealand, p. 3208.
[1168] Also known as Tuna as well as *Anguilla australis* and *Anguilla dieffenbachia*.
[1169] Also known as Matuku and *Botaurus poiciloptilus*.
[1170] Also known as Weweia and *Poliocephalus rufopectus*.
[1171] Also known as Parera and *Anas superciliosa superciliosa*.
[1172] Also known as Kōtuku ngutupapa and *Platalea regia*.
[1173] Also known as Kōtuku and *Egretta alba modesta.*
[1174] Also known as *Leptinella tenella*.
[1175] Also known as *Ranunculus macropus*.
[1176] Also known as *Stuckenia pectinate*.
[1177] Also known as Inanga and *Galaxias maculatus.*
[1178] Also known as *Nasturtium officinale*.

7.1 Introduction to baseline ecological monitoring

One of the main objectives of the Lake Waiorongomai restoration project was to revitalise the lake ecosystem in a way that made possible the return of biodiversity to a healthy, natural and improved state. It is recognised by the local whānau and hapū that it is highly unlikely to achieve a restoration state to that of the original state that existed before degradation and Pākehā[1179] contact. This is a result of the highly modified landscape, the number of introduced species, and the extinction of many native species. Therefore a goal of the restoration project was to increase native terrestrial and aquatic species in a way that would reinstate a self-sustaining ecosystem that required minimum human intervention in the way of ongoing restorative measures. By contrast, the purpose of the ecological monitoring was to assess the ecological wellbeing of Lake Waiorongomai and surrounding wetlands. Two main ecological indicators were used to achieve this monitoring outcome: (i) population counts; and (ii) water quality.

At the first LWRP Wānanga (February 2014), whānau groups identified key kaupapa[1180] that they wanted addressed as part of the restoration project. This list of key kaupapa included ecological criteria such as: (i) improving water quality; (ii) reinstating the mauri[1181] and mana[1182] of the lake ecosystem; and (iii) restoring native wildlife stocks.[1183]

At this initial wānanga[1184], whānau and hapū voiced collective support for this doctoral research endeavour along with the use of western science ecological monitoring as an integral part of the restoration project. The usefulness of recording baseline ecological

[1179] Non-Māori, European.
[1180] Values, stratey, purpose.
[1181] Life force.
[1182] Prestige, integrity, charisma.
[1183] LWRP Wananga, 22-23rd February 2014, Raukawa Marae.
[1184] Learning, workshop, seminar.

data that could be utilised later in comparative analysis was seen as beneficial for whānau and hapū and their ongoing expression of kaitiakitanga. It would also provide a practical tool for archiving evidence that adaptive strategies and restoration measures were effective in the future. The specific ecological indicators measured (concurrently) in this baseline involved: (i) water quality; and (ii) abundance and diversity of: eels, other fish species, macroinvertebrates, bird species, terrestrial and aquatic plants. Ecological baseline monitoring activities started in February 2014 and concluded on the 5th of February 2015 when the lake ecosystem boundary fence[1185] was completed.

Ecological monitoring activities were supported by hapū expertise and external volunteers. Four Māori scientists (pūkenga) were in ecological restoration activities (i.e. Caleb Royal, Tanira (Rolly) Raureti, Pātaka Moore and I). Caleb, Rolly and I conducted the ecological baseline monitoring program described in this chapter. The involvement of these iwi scientists (who belong to local hapū) contributed to the relative ease with which whānau and hapū accepted the involvement of scientific research methods in this restoration project. Volunteers and whānau, who were at times offered a koha[1186] for their assistance, provided a cost effective means of creating an initial picture of ecosystem wellbeing at Waiorongomai wetlands.

7.2 Ecological monitoring methods

This section outlines the western science ecological monitoring methods used in this study and the locations of data collection within the lake ecosystem restoration area. The map below shows Lake Waiorongomai, the sampling sites and inventory areas referred to in this chapter (Figure 7.2.1). The sampling sites numbers, longitude and latitude references and site names are depicted in Table 7.2.1.

[1185] Waiorongomai Block 10.
[1186] Meaning donation or gift.

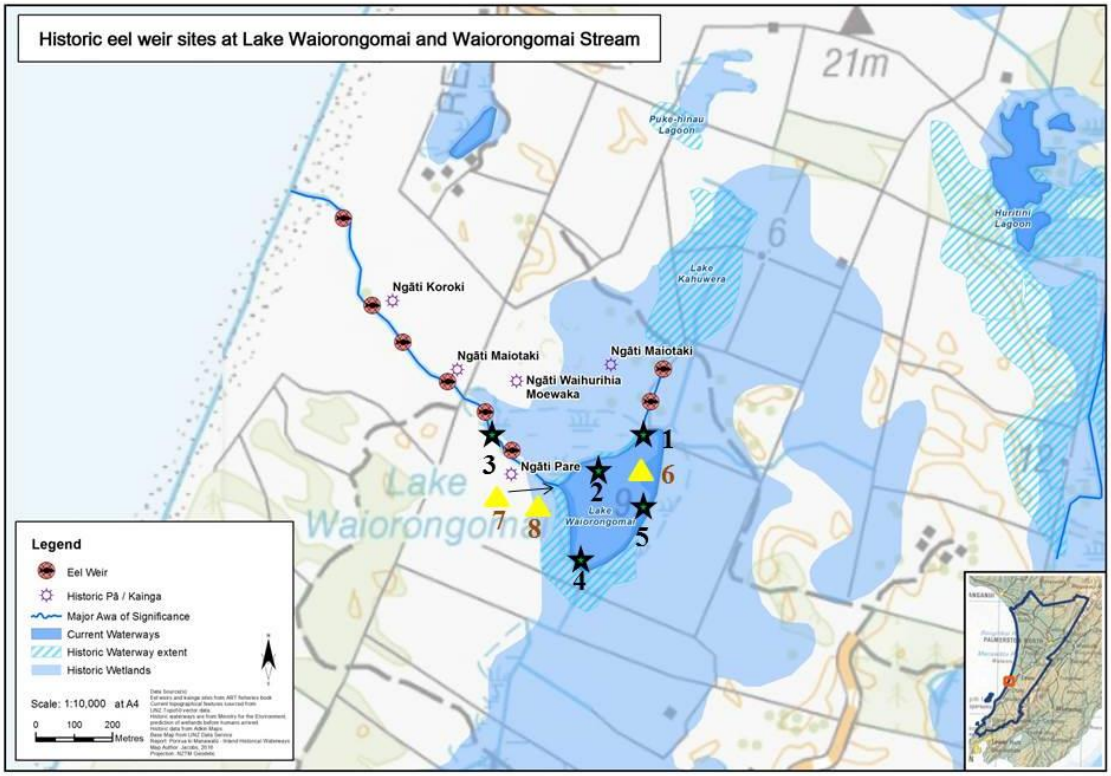


Figure 7.2.1 Map showing sampling sites, the site numbers correspond to Table 7.2.1 (*Source: adapted from original map by Miki Rikihana recreated by Jacobs in Potter, et al., 2017, p. 119)*

Table 7.2.1 Sampling site locations

Site #	Longitude	Latitude	Site names
1	175°8’41”E	-40°42’37”S	Northern Drain
2	175°8’32”E	-40°42’40”S	Lake West Side
3	175°8’21”E	-40°42’37”S	Waiorongomai Stream
4	175°8’32”E	-40°42’51”S	Southern Drain
5	175°8’32”E	- 40°42’45”S	Lake East Side
6			DO Meter Spot
7			Western Stream Outlet
8			Bird hill

7.2.1 Water quality monitoring method

Nationally, the Trophic Level Index (TLI) is the accepted method to assess the quality and trophic status of the water in a lake.[1187] The TLI values derived from measurements provide an indication of lake water quality in relation to a level of trophic state as detailed in Table 7.2.2.[1188] The physical and biological components measured in this analysis include: chlorophyll *a* (Chl a); secchi depth (SD); total phosphorus (TP); and total nitrogen (TN). At Lake Waiorongomai, early TLI results provide an important baseline for Lake Waiorongomai and the outgoing Waiorongomai Stream. By combining these individual indicators, an averaged value for the entire restoration area has been created. Average annual values have been used in the results section to remove seasonal influences in the data and thus estimate the trophic level of Lake Waiorongomai.

Table 7.2.2 Categories of TLI for different trophic states in lakes in New Zealand

Trophic state	**Nutrient enrichment category**	**Trophic level**	**Chl a (mg/m^3)**	**SD (m)**	**TP (mg/m^3)**	**TN (mg/m^3)**
Ultramicrotrophic	Practically pure	0.0 to 1.0	0.13–0.33	33–25	0.84–1.8	16–34
Microtrophic	Very low	1.0 to 2.0	0.33–0.82	25–15	1.8–4.1	34–73
Oligotrophic	Low	2.0 to 3.0	0.82–2	15 – 7	4.1–9	73–157
Mesotrophic	Medium	3.0 to 4.0	2–5	7–2.8	9–20	157–337
Eutrophic	High	4.0 to 5.0	5–12	2.8 – 1.1	20–43	337–725
Supertrophic	Very high	5.0 to 6.0	12–31	1.1 – 0.4	43–96	725–1558
Hypertrophic	Saturated	6.0 to 7.0	>31	< 0.4	>96	>1558

Five water quality sites were sampled every three months at sites 1-5, as detailed in Table 7.2.1 and depicted in Figure 7.2.1. Collected samples were analysed for total

[1187] Burns, L, *et al.,* 2000, Protocol for monitoring trophic levels of New Zealand lakes and reservoirs, p. 8.
[1188] Derived from Burns, L., et al., 2000, p. 10. Cited by Cahill, M., *et al.,* 2010, Management plan proposals for Lake Waitawa, Otaki, p. 17.

phosphorous (TP)[1189], total nitrogen (TN)[1190], faecal bacteria *Escherichia coli* (Ecoli)[1191] and chlorophyll a (Chl a)[1192]. A dissolved oxygen meter[1193] and salinity meter[1194] were deployed on an existing pole in the lake approximately 50 metres from the edge of the lake at site 6 (Figure 7.2.1 and Table 7.2.1). Lake clarity was also measured at the site 6 with a secchi disc.[1195] Lake water temperature, salinity and conductivity were also measured at site 6 using a digital meter. Salinity was included in the water quality monitoring because of the evidence of the presence of *Mysidae* shrimp found during the macroinvertebrate monitoring. As this shrimp species is known to inhabit estuarine environments its presence piqued our interest in the extent to which Lake Waiorongomai provided opportunity for the intrusion and mixing of salt water.

7.2.2 Eel monitoring method

Six-monthly monitoring of eel was conducted by Caleb Royal to: (i) measure and create time series, eel population abundance data; and (ii) to visually assess individual eel wellbeing. The results of this monitoring work was presented in three reports for Ngā Hapū o Ōtaki and the GWRC.[1196]

Concerning sampling method, eels were collected during three sets (mid-February 2013, 6 September 2013 and 6 March 2014) using a hīnaki[1197]. They were taken from Lake Waiorongomai at the mouth of the Waiorongomai Stream, site 7 (Figure 7.2.1). The

[1189] Methodology: APHA 22nd Ed. 4500-P J, E with a detection limit of 0.01 g/m^3. Central Environmental Laboratories: Taiwhanga Aroturuki Taiao, Palmerston North.
[1190] Methodology: APHA 22nd Ed. 4500-P J and 4500-N)2 B with a detection limit of 0.05 g/m^3. Central Environmental Laboratories: Taiwhanga Aroturuki Taiao, Palmerston North.
[1191] Methodology: APHA 22nd Ed. 9223B with a detection limit of 1MPN/100mL. Central Environmental Laboratories: Taiwhanga Aroturuki Taiao, Palmerston North.
[1192] Methodology: APHA 22nd Ed. 10200 H (modified). Acetone extraction. Spectroscopy. Default detection level of 0.003 g/m^3. Hill Laboratories, Hamilton.
[1193] D-Opto model loaned and calibrated by GWRC.
[1194] YSI 30/10FT model loaned and calibrated by GWRC.
[1195] Made by local craftsman Noel McBeth.
[1196] Royal, C., February 2013, September 2013 and March 2014 Lake Waiorongomai tuna monitoring reports, Waiora Solutions Ltd prepared for Ngā Hapū o Ōtaki and GWRC. (unpublished reports)
[1197] Similar to a fyke net, designed to trap eels.

rationale used for the selection of this eel sample site was explained by Caleb Royal who suggested that "the Waiorongomai stream is the only physical connection the lake has with the ocean, and as such is the primary source of food for fish migrating into the lake."[1198] A sample set composed of 10 individuals captured in each catch were sedated using clove oil at the concentration of approximately 1000:1 (1 litre of water to 1mL of clove oil). The sedated eels were then measured for length and weight, then visually examined for their wellbeing by assessing their general appearance and health by focusing attention on their skin, eyes, mouths, nostrils and body condition. A further subsample of each catch was then processed to determine the age and gender of each individual eel. This was accomplished by dissection, removing the inner ear otolith (used for age estimation) and gonad from the stomach lining used for gender determination. The otolith was charred (using controlled temperature in an oven) and then examined under a microscope to determine the age. The gonad was stained with dye and examined under a microscope to assess gender.[1199]

In addition to these assessment and sampling activities, local whānau, hapū and iwi members were encouraged to report their personal catches within Lake Waiorongomai. One catch by a local iwi member provided an interesting result. The inspection of the gut contents revealed evidence of red worm parasites. The relevance to Māori is the perception that the health of the food is directly related to the health of those eating it. Thus this observation was important to the whānau and hapū of Waiorongomai, so the data of this catch has been included in the results and discussion sections.

[1198] Royal, C., February 2013, Lake Waiorongomai tuna monitoring report, Waiora Solutions Ltd prepared for Ngā Hapū o Ōtaki and GWRC, p. 4. (unpublished report)
[1199] Royal, C., February 2013, Lake Waiorongomai tuna monitoring report, Waiora Solutions Ltd prepared for Ngā Hapū o Ōtaki and GWRC. (unpublished report)

7.2.3 Fish monitoring method

The method selection for fish[1200] monitoring utilised the written guidelines detailed in the '*Field Guide New Zealand Freshwater Fish Sampling Protocols'*.[1201] Using five parameters, score sheets were used to rate three common methods used in freshwater fish monitoring (i.e. trapping, spotlighting and electrofishing).[1202] This scoring system (Table 7.2.3) indicated that trapping was the best sampling technique for both the lake and stream of Waiorongomai.

Table 7.2.3 Scoring system results for freshwater fish monitoring method selection

	Lake			**Stream**		
Parameter	Trap	Spot	Electro	Trap	Spot	Electro
Water velocity	3	3	1	3	3	2
Conductivity	3	3	0	3	3	0
Turbidity	3	1	1	3	1	1
Vegetation	3	1	0	3	1	0
Depth	2	3	2	2	3	2
TOTAL SCORES:	**14**	**11**	**4**	**14**	**11**	**6**

The site selection replicated the water and aquatic insect monitoring sites, as recommended in the Freshwater Fish Sampling Field Guide - "where possible it is encouraged to collect habitat, water quality and invertebrate data at the same sites".[1203] This provides multiple layers of ecological information for each location that is particularly useful in moving beyond fish monitoring to a wider state of the environment monitoring perspective.

Four fish monitoring exercises were conducted for this baseline study at Lake Waiorongomai and Waiorongomai Stream. The first excursion net set included five G-

[1200] Meaning the monitoring was targeting at all fish species including eels.
[1201] Joy, M., *et al.,* 2013, Field guide New Zealand freshwater fish sampling protocols: Part 1 – Wadeable rivers and streams, p. 2.
[1202] Ibid, p. 3.
[1203] Ibid, p. 7.

minnow nets placed at sites 1-5 (Figure 7.2.1), on the 30th of March 2014. Cooked shrimps *(Penaeus vannamei)* were used as bait in all nets. The second fish monitoring exercise was conducted six months later on the 28th of October 2014 and included the five G-minnow nets set in the same locations for consistency plus a fyke net at site 5. The third fish monitoring exercise was a small net set of only one fyke net and one G-minnow net at site 5 (Figure 7.2.1). This exercise was conducted for the benefit of Te Rito students at their wānanga on the 6th November 2014. The fyke nets yielded great results as detailed in the next section. This outcome led to the deployment of 5 G-minnow nets and 5 fyke nets at sites 1-5 (Figure 7.2.1), as recommended by the New Zealand Freshwater Fish Sampling Field Guide.[1204] This fourth and final large scale fish monitoring exercise was carried out on 13th November 2014.

7.2.4 Macroinvertebrates monitoring method

Macroinvertebrate samples were collected quarterly with a micro-mesh insect net scooped through the water alongside the reeds for one minute at each of the sites 1-5 (Figure 7.2.1). Invertebrates were identified using the '*Guide to the Aquatic Insects of New Zealand'*.[1205]

7.2.5 Birds monitoring method

The bird monitoring for this restoration project was kindly completed by the local volunteer group Forest and Bird Society Horowhenua. This enthusiastic group had an established relationship with Te Reo a Taiao Raukawa ki te Tonga (Taiao Raukawa) and was already engaged in the MTM Programme, helping to monitor the birds at the Te Hākari Wetland and Ōhau Lagoon in Kuku (Figure 1.2.2).

[1204] Joy et al., 2013, Field guide New Zealand freshwater fish sampling protocols: Part 1 – Wadeable rivers and streams, p. 21.
[1205] Winterbourn, & Gregson, 1981.

The Forest and Bird Society use the five minute bird counting method to record their findings. The five minute bird counts technique has been used in New Zealand to observe and record bird populations since Turbott's census on Tararua Island in 1940.[1206] In general this technique is used to study forest birds. In 1972 and 1973 the Department of Scientific and Industrial Research conducted a study on the methodology options in use in New Zealand to count birds.[1207] These two studies concluded in a report that the five minute bird count is the recommended technique. In the 1980's this method was used to find that birds in the West Coast and Central North Island forests were under threat from logging. This method of bird counting does not seek to calculate the exact population size or density instead it is used to create an index measure. This index technique measures the individuals present in order to infer population density.[1208]

At Lake Waiorongomai, the site from which the bird watchers made their observations was the highest point surrounding the edge of the lake, at site 8 (Figure 7.2.1 and Table 7.2.1). This location also provided the added advantage of being able to look down the Waiorongomai Stream towards the ocean. In addition to these regular bird monitoring events, whānau, hapū and iwi members were encouraged to report sightings of rare or culturally significant birds during their lake visits and excursions (hīkoi). These local whānau, hapū and iwi reportings are also included in the results and discussion sections.

7.2.6 Terrestrial plant monitoring method

Two plant inventories were conducted during consecutive summers to identify species within the Lake Waiorongomai restoration area. The first inventory was taken on 31 January 2014 and the second on 18 January 2015. Plant identifications were made in

[1206] Dawson, D., & Bulls, P., 1975, Counting birds in New Zealand forests, p. 101.
[1207] http://www.doc.govt.nz/our-work/five-minute-bird-counts/history-of-the-5mbc-project/
[1208] http://www.doc.govt.nz/conservation/native-animals/birds/five-minute-bird-counts

the field by two experienced plant enthusiasts, botanist Pat Enright and Tim Park (Greater Wellington Regional Council Biodiversity Officer, later Wellington District Council Environment Partnership Leader). As a result of these plant inventories two reports were produced for Ngā Hapū o Ōtaki by Pat Enright.[1209] Plant specimens that were not able to be exactly identified in the field were taken (approved by kaitiaki team members) and later identified by Pat Enright as well as staff at the Museum of New Zealand: Te Papa Tongarewa (Te Papa). Due to time constraints only part of the restoration area was covered in the first excursion. The remainder of the restoration area was completed during the second visit.

7.2.7 Aquatic plant monitoring method

Aquatic plant monitoring was based on visual observations by Gray Jamieson, director of New Zealand Waterways Restoration, an organisation that specialises in sustainable aquatic weed control, algae management and pest fish control.[1210] Aquatic plant specimens that were not able to be identified in the field were photographed by Gray Jamieson for later identification in his office. Some aquatic plants were also identified in the terrestrial plant inventories by Pat Enright (Botanist in the Wellington Botanical Society) and Tim Park (GWRC Biodiversity Coordinator). Other specimens were also sent on and identified by Paul Champion at NIWA (National Institute of Water and Atmospheric Research: Taihoro Nukurangi).

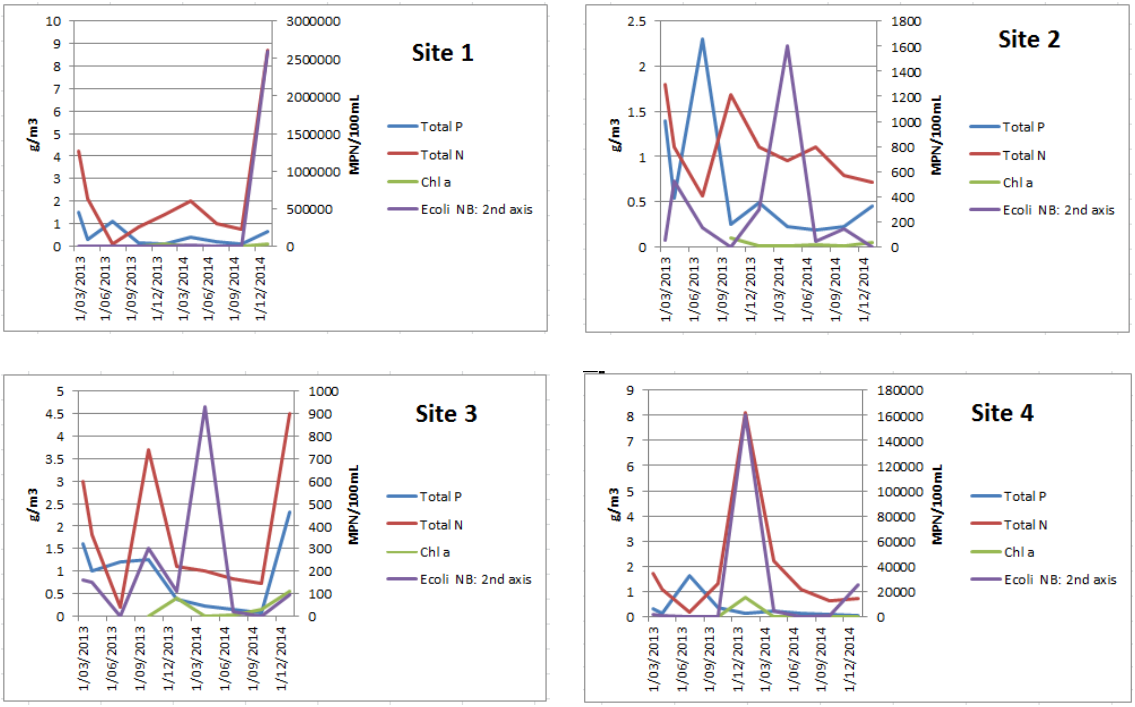
7.3 Ecological baseline monitoring results

This section outlines the ecological monitoring results and provides a brief commentary on the significance of each indicator dataset.

[1209] Enright, P., 2015, List of vascular plants around Lake Waiorongomai, Horowhenua, along the outlet from the lake to the beach and the beach surrounding the mouth. (unpublished report)
[1210] Further information available on the website address http://www.nzwaterways.co.nz.

7.3.1 Water monitoring results

Total phosphorus (Total P), total nitrogen (Total N), chlorophyll a (Chl a), and faecal bacteria (Ecoli) recorded from the five sites sampled between 2013 to 2015 are plotted in Figure 7.3.1 (actual records are in Appendix 14). Site 1 (Northern Drain Inlet) showed large spikes in Ecoli and nitrogen levels in March 2013 and January 2015. Site 2 (West side of lake) had low levels of phosphorus, nitrogen, chlorophyll a and Ecoli. Site 3 (Waiorongomai Stream) had a couple of moderate spikes in nitrogen and Ecoli levels at different times during the monitoring events. Site 4 (Southern Drain Inlet) had one dramatic event in the summer of 2014 involving very high levels of Ecoli and total nitrogen. By contrast, site 5 (East side of lake) showed no obvious trends of concern with any of the parameters measured.



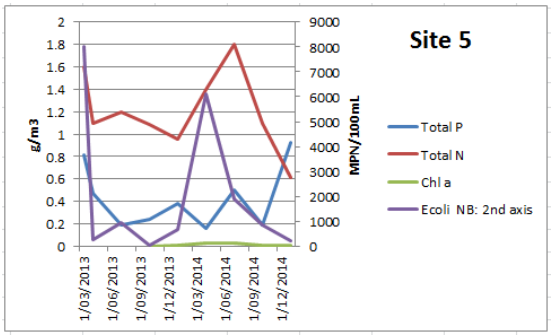


Figure 7.3.1 Water quality measures collected at the 5 sites between 2013-2015

The overall averages of Total P, Total N, Chl a and Ecoli, recorded from the five sites sampled between 2013 and 2015 are plotted in Figure 7.3.2 (actual records are in Appendix 15). Nitrogen ranged between 0.798 and 3.05 g/m^3, phosphorous ranged between 0.12 and 1.12 g/m^3, chlorophyll results ranged between 27.6 and 135.2 mg/m^3, and Ecoli results ranged between 290 and 525,061.6 MPN/100mL.

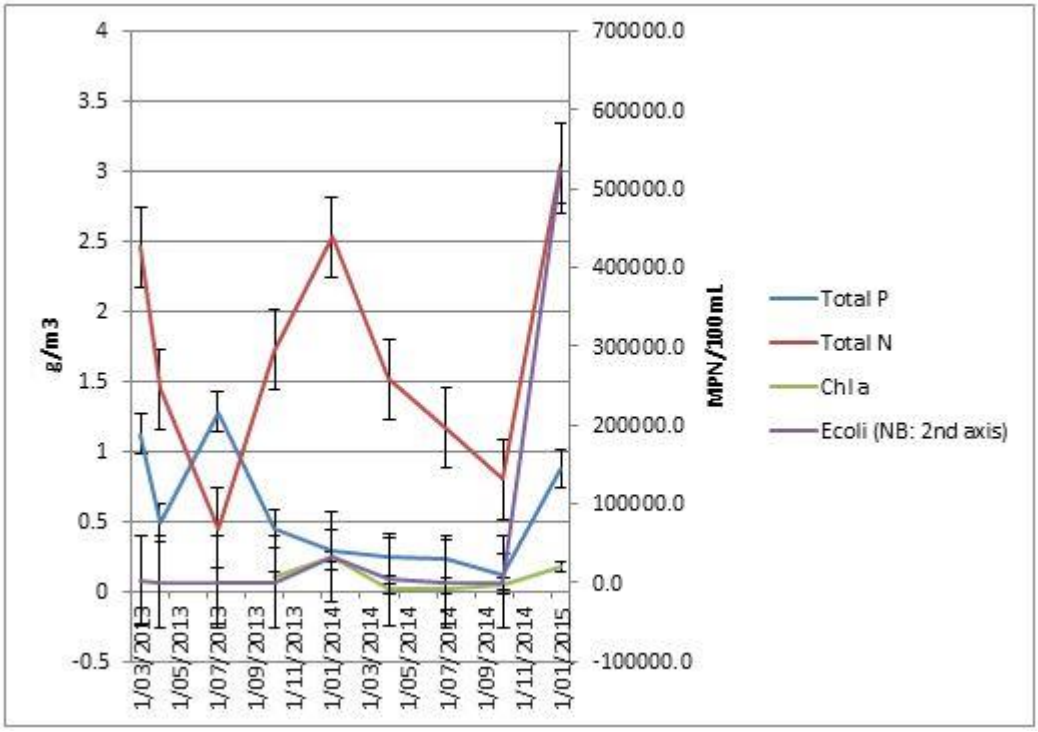


Figure 7.3.2 Water quality measures collected at Lake Waiorongomai between 2013-2015

The results of water samples that were analysed for dissolved oxygen, turbidity, temperature, salinity and conductivity are plotted in Figure 7.3.3. The highest water temperature of 20.4 ^{o}C recorded was in March 2013 and the lowest recorded temperature was 8 ^{o}C in July 2014. The average dissolved oxygen was relatively stable between 8.18 and 12.27 ppm. The secchi disc trend measured the water transparency as higher in summer than in other months. The salinity and conductivity levels in the lake indicated the presence of salt water intrusion and mixing in the lakes fresh water column.

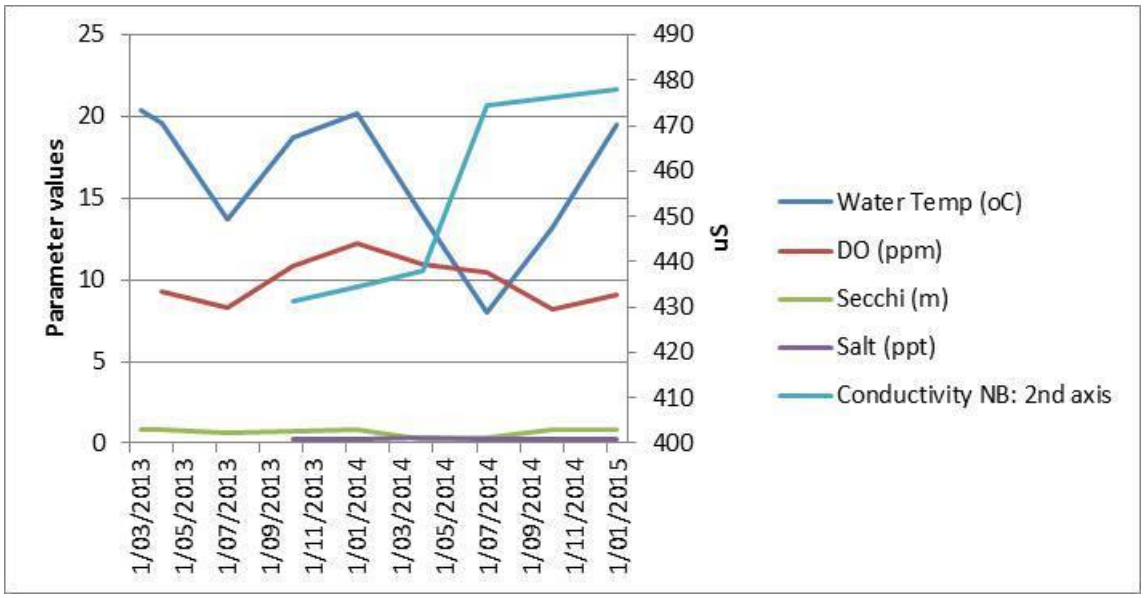


Figure 7.3.3 Water quality measures collected at the 5 sites between 2013-2015

The New Zealand Ministry for the Environment sets a National Policy for freshwater management which provides a National Objectives Framework to assist council and communities plan for freshwater objectives.[1211] The National Policy Statement was updated recently in August 2017. The current healthy and bottomline states for relevant water quality parameters are presented in the Table 7.3.1.[1212] When national water

[1211] Ministry for the Environment, 2017.
[1212] Derived from Ministry for the Environment, 2017, pp. 30-40.

quality parameters are compared with the average results presented for the five sites sampled at Lake Waiorongomai (Table 7.3.1) they were above the National Policy bottomline objectives. At times the Waiorongomai water quality data breached the bottomline objectives. However, the average water quality results from Waiorongomai (Figure 7.3.2 and Figure 7.3.3), when compared with the National Policy parameters, indicate a healthy ecosystem state at Lake Waiorongomai.

Table 7.3.1 National freshwater attributes affecting aquatic ecosystem health

Attribute	Healthy State	Slightly impacted	Impacted	At risk (below the bottomline)
Total Phosphorus mg/m^3 Annual median	≤10	>10 and ≤20	>20 and ≤50	>50
Total Nitrogen mg/m^3 Annual median	≤300	>300 and ≤500	>500 and ≤800	>800
Ecoli /100mL median concentration	≤130	≤130	>130	>260
Dissolved Oxygen mg/L Mean value NB: rivers	≥7.5	≥5.0 and <7.5	≥4.0 and <5	<4

The trophic levels for each of the TLI parameters[1213] of Lake Waiorongomai are plotted in the graphs below (Figure 7.3.4). These results show that the Lake Waiorongomai baseline trophic level was mostly hypertrophic based on the TLI table values (Table 7.2.2).

[1213] Total phosphorus, total nitrogen, secchi disc and chlorophyll a.

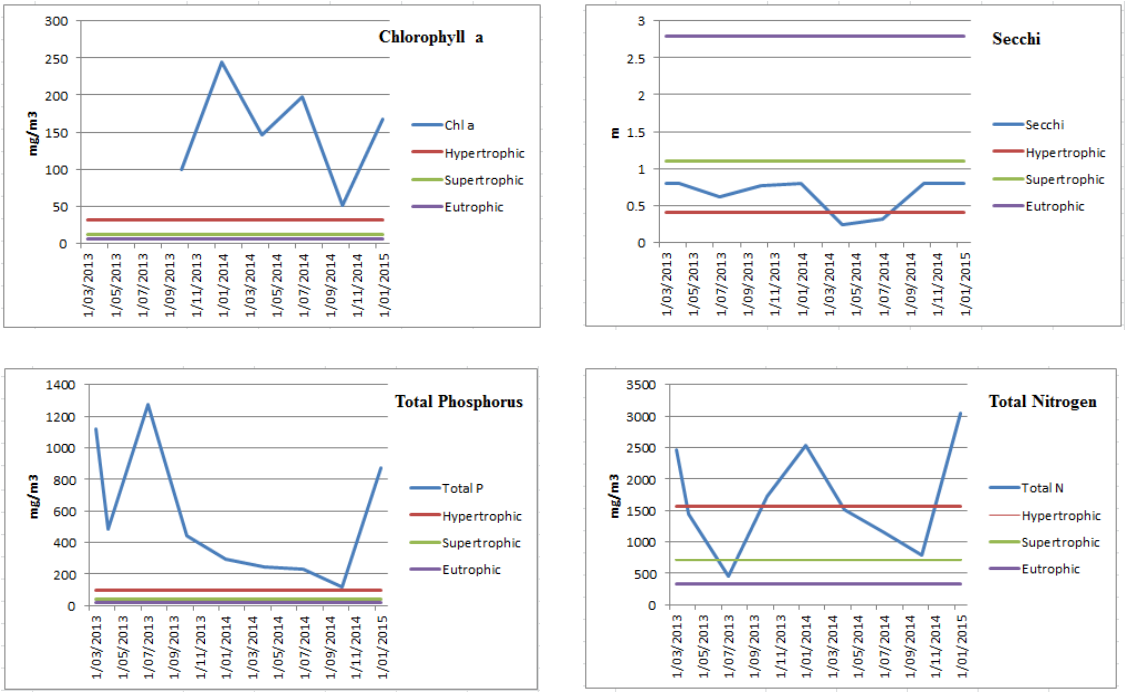


Figure 7.3.4 Water quality parameters measured at Lake Waiorongomai between 2013 and 2015 against trophic levels

The dissolved oxygen readings taken each 15 minutes over 24 hour periods are displayed in Appendix 16. Notably in the summer months, extremely low dissolved oxygen readings are present in January 2014 at 9.15am reaching 3.15ppm and in February 2015 at 7.30am an extreme value of 0.783ppm. The variation in the dissolved oxygen readings in the January 2014 results from the highest reading of 27.46ppm at 3.45pm to the 3.15ppm at 9.15am is likely to have caused stress to the aquatic biota in particular sensitive species.

7.3.2 Eel monitoring results

The total number of eels[1214] caught in Lake Waiorongomai at Site 7 (Figure 7.2.1) during each of the baseline monitoring events, were: 27 eels in mid-February 2013; 36 eels on 6 September 2013; and 11 eels on 6 March 2014. Examination of the skin indicated no visible disease. The subsets of 10 sampled individuals from each

[1214] Māori name is Tuna with a variety of species, where western scientific naming only recognises two.

monitoring event, measured for length and weight, as well as aged and gendered, are displayed in Appendix 17. The majority of eels caught during monitoring activities were shortfin eel *(Anguilla australis)*. Longfin eel *(Anguilla dieffenbachii)* were only present on occasion and in very small numbers.

The average size of the subset of eels caught in the February 2013 catch were small, 565.5mm in length and 365.9g in weight. The average age of this subset of eels on the February 2013 monitoring event was 14 years (Table 7.3.2). Visual inspection of the otoliths indicated eels were growing well when they are young and predominantly feeding on macroinvertebrates[1215]. The otoliths indicated this slows down dramatically after 8-10 years when they should begin feeding on fish. Caleb Royal suggests this result may be evidence "that the lake sustains a healthy invertebrate (bug) community, but sustains a poor fish community."[1216] The macroinvertebrate results are discussed later in sub-section 7.3.4.

Table 7.3.2 Eel monitoring average results

Date	**Species % SF (**Short fin)	**Average Eel Length** (mm)	**Average Eel Weight** (gm)	**Average Eel Age** (years)	**Average Annual Weight Gain** (gm/year)	**% Gender Females**
Mid/02/13	90	565.5	365.9	14.0	26.1	70
06/09/13	90	637.0	551.0	18.3	30.1	90
06/03/14	100	663.2	538.6	17.4	30.9	unknown

The average annual eel weight gain of 26.1g measured in February 2012 seen in Table 7.3.2 increased six months later to 30.1g in September 2013. The September 2013 monitoring event observed larger eels than the earlier sampling with an average length,

[1215] For example, aquatic insects and worms.
[1216] Royal, C., February 2013, Lake Waiorongomai tuna monitoring report, Waiora Solutions Ltd prepared for Ngā Hapū o Ōtaki and GWRC, p. 5. (unpublished report)

weight and age of 637.0mm, 551.0g and 18.3 years (Table 7.3.2). These average sizes were similar in the following monitoring event in March 2014 with an average length, weight and age of 663.2mm, 538g and 17.4 years (Table 7.3.2). The average annual weight gain measured in March 2014 was 30.9g per year.

The eel results ranges for length, weight and age measurements caught in each set are seen in Table 7.3.3. The longest eel caught was 800mm, the shortest 480mm. The heaviest eel caught was over 1kg weighing 1340gm. The lightest eel caught was 222gm. The oldest eel caught was 33 years old and the youngest 8 years.

Table 7.3.3 Eel monitoring results ranges

Date	**Minimum Length** (mm)	**Maximum Length** (mm)	**Minimum Weight** (gm)	**Maximum Weight** (gm)	**Minimum Age** (years)	**Maximum Age** (years)
Mid/02/13	480	680	222	665	8	24
06/09/13	580	800	370	1340	13	31
06/03/14	590	720	387	707	9	33

The eel results of another hīnaki set on the 15th October 2013 by an iwi kaitiaki member[1217] found 36 shortfin eels. Most were bronze in colour while some had a predominantly silver appearance. Twenty eels were measured for length with an average of 69 cm. The raw data is displayed in Appendix 18. Of interest to whānau, hapū and iwi was the observation and dissection of the gut contents of five specimen eels. The presence of red worm parasite cysts, were discovered upon in viewing of the gut contents.[1218] The gut lining of three out of the five specimens were much thicker

[1217] That requested to be anonymous.
[1218] Potentially the round worm parasite and cyst commonly known as Shagworm *(Eustrongylides sp.)* found on the swim bladders of long fin and short fin eels. Williams, E., 2014, Tuna training manual, Tirorangi Marae, pp. 60 & 62. "The National Centre for Biosecurity and Infectious Disease (http://www.ncbid.govt.nz/) is a collaboration between four New Zealand scientific and government agencies, MPI, Crown Research Institutes AgResearch and Environmental Science and Research (ESR)

than the others and had numerous parasites (refer to Figure 7.3.5). This was an unusual sighting for the kaitiaki, who has caught a lot of eels locally for consumption.[1219] The gut contents consisted of mostly brown sludge material with only one or two partial remains of fish present. On viewing the gut lining photos Caleb Royal identified the red worms as parasites having transferred from snails. In his opinion the presence of these red worm parasites provided evidence that could help to explain his findings of small otolith growth rings in adult stages of eels.[1220] Thus, slower than average annual growth rates in eels might be the result of a combination of: (i) shifts in the macroinvertebrate/preferred fish diet in Lake Waiorongomai; and (ii) a loss of condition caused by physiological responses to the presence of intestinal parasites (e.g. enlarged stomach walls).

Figure 7.3.5 Red parasites in eel gut lining *(Source: photo taken by anonymous kaitiaki, 16 October 2013)*

plus state-owned enterprise AsureQuality. The agencies work collaboratively on specific projects and research related to biosecurity and infectious disease. NCBID is New Zealand's largest concentration of bacteriologists, virologists, and epidemiologists specialising in human and animal health. You are able to contact experts in this field via this website and send through photos of any parasites/diseased eels for identification." Williams, 2014, p. 58. Potentially something the whānau and hapū may decide to do in the future. Reference and recommendations provided by Dr Erica Williams (National Institute of Water and Atmospheric Research Ltd., Maori Environmental Research Scientist, personal communication, email dated 4 October 2017).

[1219] Anonymous kaitiaki, personal communication, 16th October 2013.

[1220] C. Royal, personal communication, 22 February 2014.

7.3.3 Other fish monitoring results

Common bully[1221] were the dominant species in the lake and stream. The settings also trapped small shortfin eels[1222]. The presence of eels in some sets also indicates that more fish would definitely have been consumed and present in their bellies. This basic fish analysis did not include gutting the eels. The eels and fish were returned to the lake alive. The total fish counts caught in the trap settings for the restoration area on each sampling event are collated in Table 7.3.4.

Table 7.3.4 Total fish counts for all the monitoring results

	Date				
Species	**31/3/14**	**29/10/14**	**7/11/14**	**14/11/14**	**TOTAL**
Common bully	22	183	125	400	730
Whitebait	0	0	0	5	5
Shortfin eel	1	10	3	64	78

Table 7.3.5 displays the total fish species caught during each sampling event at sites 1-5. Whitebait[1223] was first recorded in the Waiorongomai Stream (site 3) during this case study on the 14 November 2014 upstream of the collapsed culvert that had been replaced on 1 October 2014. The presence of this taonga species was a significant discovery for whānau and hapū because this provided early evidence that their restoration efforts were improving the lake ecosystem wellbeing. For example, the identification of a whitebait specimen was confirmed by Caleb Royal as an inanga (Figure 7.3.6).

[1221] Also known as Toitoi and *Gobiomorphus cotidianus*.
[1222] Also known as Tuna and *Anguilla australis.*
[1223] Also known as Inanga and *Galaxias maculatus*.

Table 7.3.5 Total fish counts for monitoring results at each site

Date **31/03/14**	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Time 11am					
Species					
Common bully	14	0	4	0	4
Whitebait	0	0	0	0	0
Shortfin eel	0	0	0	1	0
Date **29/10/14**	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Time 5pm					
Species					
Common bully	0	11	0	45	127
Whitebait	0	0	0	0	0
Shortfin eel	0	1	0	0	9
Date **06/11/14**	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Time 1pm					
Species					
Common bully					125
Whitebait					0
Shortfin eel					3
Date **14/11/14**	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Time 10am					
Species					
Common bully	25	27	30	105	213
Whitebait	0	0	5	0	0
Shortfin eel	7	16	5	20	16

Figure 7.3.6 Whitebait-Inanga specimen caught in Waiorongomai Stream - Site 3 (*Source: Photo taken by Aroha Spinks 14/11/14*)

Total fish counts and size classes for fish species caught at each of the five sites (1-5) caught during each monitoring event are displayed in Appendix 19. The total fish numbers caught per size class on each sampling excursion in the restoration area are detailed in Table 7.3.6. Small sized common bullies were the most abundant fish specie.

Table 7.3.6 Total fish size counts for all the monitoring results

Date	**31/3/14**	**29/10/14**	**7/11/14**	**14/11/14**	**TOTAL**
Time	11am	5pm	1pm	10am	
Species					
Common bully <5cm	22	141	90	356	609
Common bully ≥5cm	0	42	35	44	121
Whitebait	0	0	0	5	5
Shortfin eel <20cm	0	3	1	21	25
Shortfin eel ≥20 to <40cm	0	7	2	43	52
Shortfin eel ≥40 to <60cm	1	0	0	0	1

7.3.4 Macroinvertebrate species monitoring results

Total macroinvertebrates collected at sites 1-5 between 2013 and 2015 are depicted in Figure 7.3.7. These baseline results show that there is a reasonable level of macroinvertebrates in the restoration waterbodies.

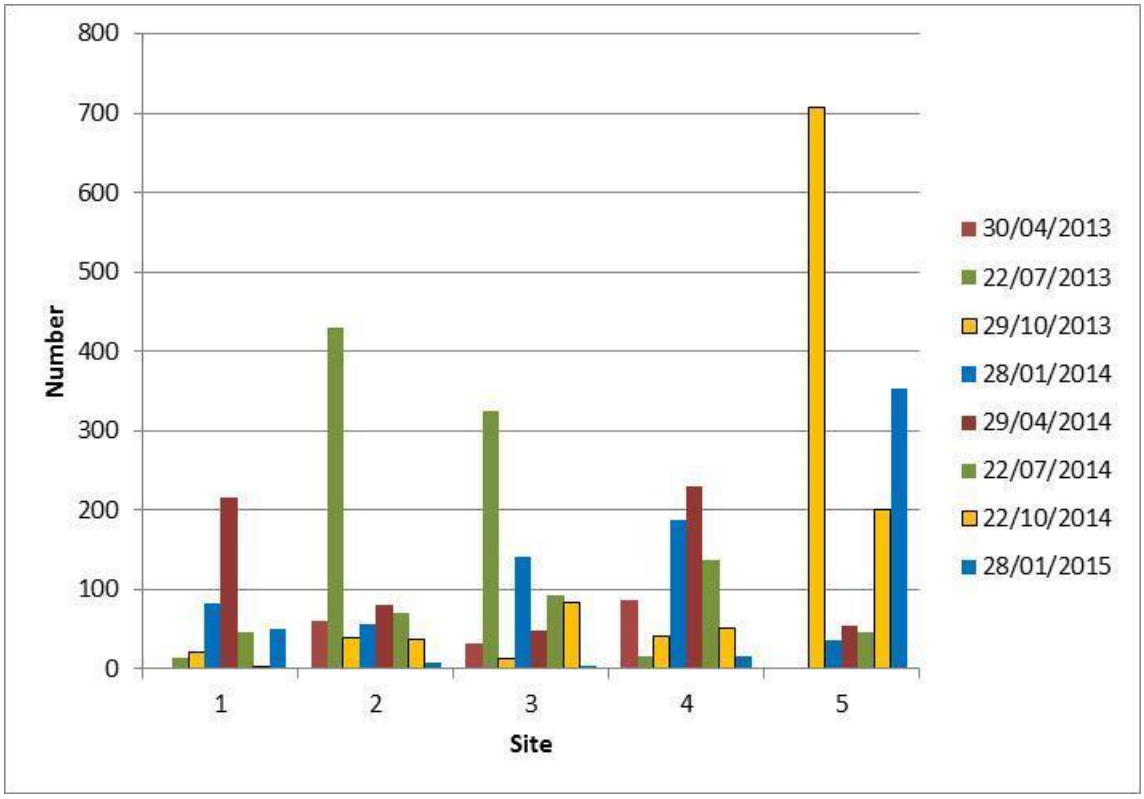


Figure 7.3.7 The baseline total number of macroinvertebrates at each site

Figure 7.3.8 shows different invertebrate species dominated at different times of the year. In particular, Isopoda, Sigara (water boatman), Amphipoda, Platyhelminthese (flatworm), Mysidae (shrimps) and copepods were present in high numbers during the baseline monitoring.

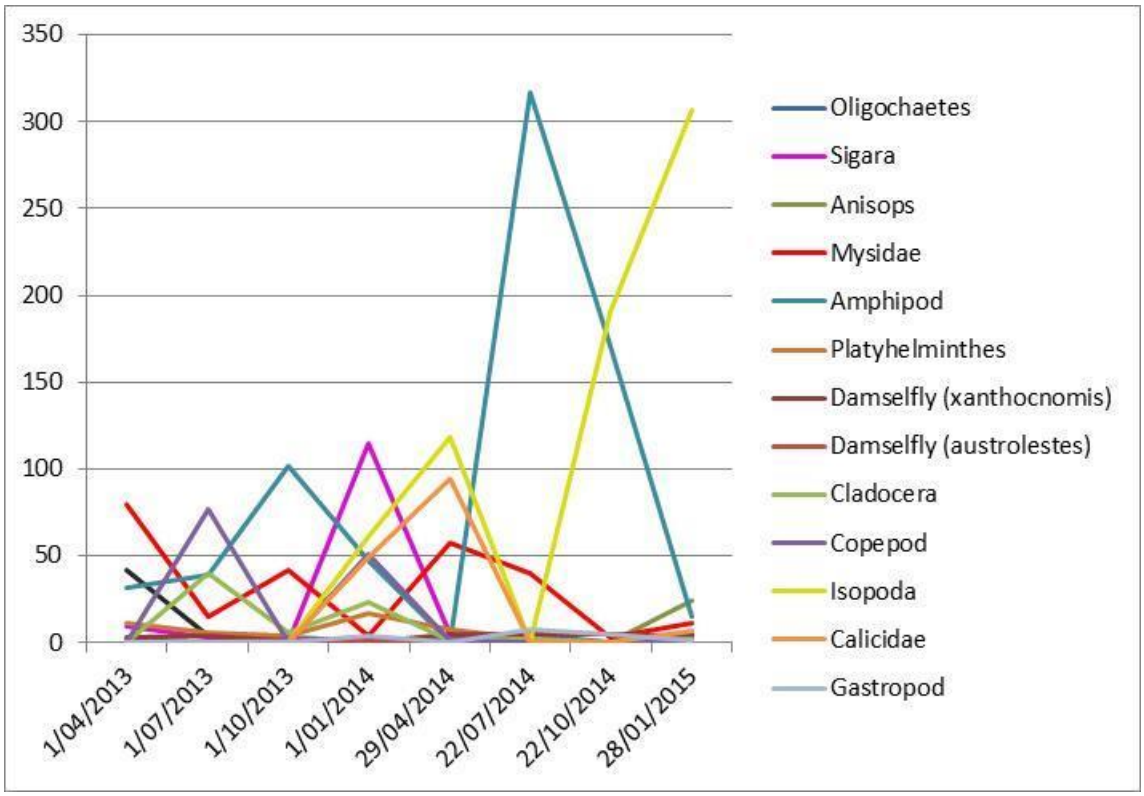


Figure 7.3.8 The total number of each macroinvertebrate species detected at each monitoring excursion in the restoration area (sites 1-5)

7.3.5 Bird species monitoring results

Birds seen between 2014 and 2015 are displayed in Appendix 20. The kaitiaki sightings are recorded in Appendix 21. Significant findings of threatened bird species sighted during this baseline monitoring included: bittern[1224], royal spoonbill[1225], white heron[1226], dab-chicks[1227] and grey ducks[1228]. The top eight most abundant bird species are displayed graphically (Figure 7.3.9) based on a visual depiction format used by Forest and Bird Society Horowhenua.

[1224] Also known as Matuku and *Botaurus poiciloptilus*.
[1225] Also known as Kōtuku ngutupapa and *Platalea regia*.
[1226] Also known as Kōtuku and *Egretta alba modesta.*
[1227] Also known as Weweia and *Poliocephalus rufopectus*.
[1228] Also known as Parera and *Anas superciliosa superciliosa*.

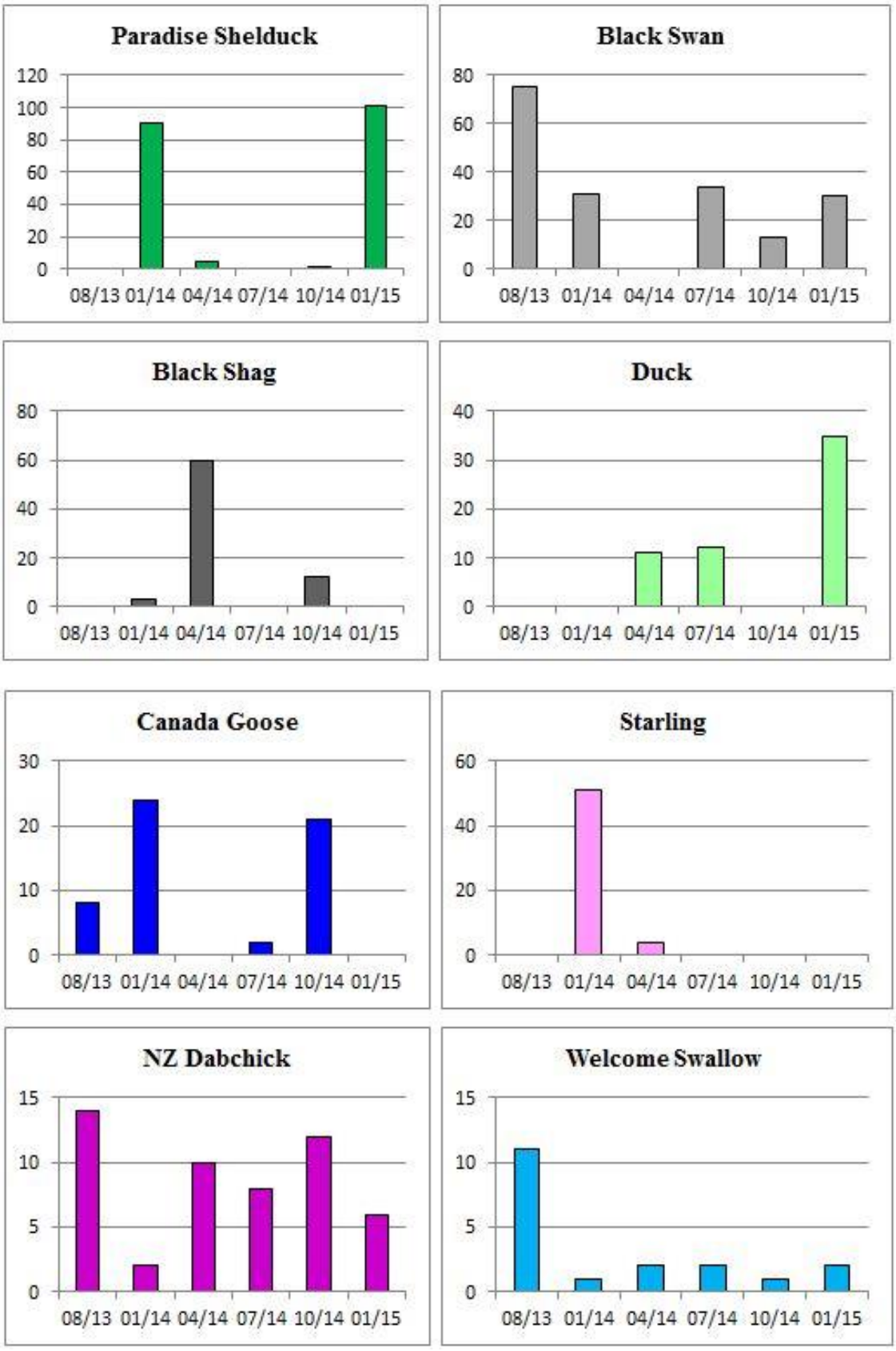


Figure 7.3.9 Bird monitoring results of the most abundant species 2013-2015

7.3.6 Terrestrial plant species monitoring results

The two plant inventories of plant species within the Lake Waiorongomai restoration area were taken 31st of January 2014 and 18th of January 2015. The list of plant species identified around Lake Waiorongomai and surround wetland and dune areas are recorded in Appendix 22. In summary the most natural native plant area of vegetation was found along the south-western edge of the lake, with the most dominant species being harakeke (*Phormium tenax*), purei (*Carex secta*), raupō (*Typha orientalis*) and, in the wetter areas, lake club rush (*Schoenoplectus tabernaemontanti*).

The more notable native plant findings in the summer of 2014 was the identification of the tiny nationally threatened button daisy (*Leptinella tenella*), which is rated 'declining' (Figure 7.3.10), and a water ranunculus: the swamp buttercup (*Ranunculus macropus*), which has a national rating of 'data deficient'. Unusual sightings included the presence of the large flowered willowherb (*Epilobium pallidiflorum*) and fork ferns (*Tmesipteris tannensis* and *T.elongata*), normally found in bush areas, were found at Lake Waiorongomai growing as an epiphyte on the base of purei (*Carex secta*). In the coastal area a good population of spinifex was found, along with one large female sand caprosma bush, which was in fruit and had seedlings nearby.[1229]

[1229] Enright, P., 2015, List of vascular plants around Lake Waiorongomai, Horowhenua, along the outlet from the lake to the beach and the beach surrounding the mouth. (unpublished report)

Figure 7.3.10 Tim Park holding the Button Daisy flower with the fern-like leaves visible in the photo *(Source: taken by Aroha Spinks 31 January 2014)*

The second plant inventory in the summer of 2015 identified a few more species. One interesting plant discovery of cultural significance to whānau and hapū was juvenile watercress (*Nasturtium officinale*) growing around the edges of Lake Waiorongomai, whereas it was previously only found along the edges of the Waiorongomai Stream. Another interesting native plant discovery during this event was a locally uncommon species of herb (*Gunnera prorepens*).

Pest weeds were documented during the 2014 summer excursion, seen in Table 7.3.7. Some individual weeds were pulled out immediately. Remaining weeds were incorporated into weed control planning and provided to contractors to guide their efforts. The particularly concerning species (e.g. boxthorn, blackberry) were GPS recorded.

Table 7.3.7 Weed species identified in January 2014

Common name	Scientific name	Comment
Sharp rush	*Juncus acutus*	All occurred near the coast at the stream mouth and could all be dealt with very quickly as they were localised and in small numbers. Most if not all of these weeds would be as a result of dumping garden rubbish on the beach.
Reed sweet	*Glyceria maxima*	
Grass pampas	*Cortaderia selloana*	
Grass giant reed grass	*Arundo donax*	
Brush wattle	*Periserianthes lophanta*	
Common alder	*Alnus glutinosa*	
Agapanthus	*Agapanthus orientalis subsp. praecox*	
Gazania	*Gazania rigins*	
Dimorphotheca	*Osteospermum fruticosum*	
Monbretia	*Crocosmia x crocosmifolia*	
Boxthorn	*Lyceum ferrosissimum*	Widespread in the dunes (Waiorongomai Block 1A) and will require a good deal more work to eradicate.
Kikuyu grass	*Pennisetum clandestinum*	Widespread

7.3.7 Aquatic plant species monitoring results

A very important aquatic plant species discovery was observed and recorded by Caleb Royal during the mid February 2013 eel monitoring event. This involved sighting the (previously unseen) noxious weed, hornwort (*Ceratophyllum demersum*) in Lake Waiorongomai. The weed was only seen at the outlet of the southern drain and not at the entrance to the Waiorongomai Stream. At the time of this February 2013 sampling event the weed was considered 'prolific'.[1230]

The aquatic plant species identified by Pat Enright and Tim Park during the terrestrial plant inventory January 2014 are cited in Appendix 22. They noted the most problematic aquatic pest weed species present in Lake Waiorongomai was hornwort (*Ceratophyllum demersum*). Other aquatic weed species included water celery (*Apium nodiflorum*) and *Potamogeton crispus*. Results of the aquatic plant survey by Gray

[1230] Royal, C., February 2013, Lake Waiorongomai tuna monitoring report, Waiora Solutions Ltd prepared for Ngā Hapū o Ōtaki and GWRC, p. 4. (unpublished report)

Jamieson taken on 30 April 2014 are detailed in Appendix 23. During the 2015 summer hīkoi, one native aquatic species of note was discovered and identified as fennel-leaved pond weed[1231]. This aquatic plant species has a national rating of 'at risk, naturally uncommon'

7.4 Discussion of the Waiorongomai ecological baseline monitoring

Having outlined key monitoring results, the aim of this section is to discuss what the baseline results suggest about the ecological state of Lake Waiorongomai and the ecological restoration aspirations of local whānau and hapū.

7.4.1 The current state of water quality in Lake Waiorongomai

According to the National Policy for Freshwater Management criteria the average water quality results at Lake Waiorongomai were above bottomline objectives, and therefore not particularly concerning. By contrast, the water quality baseline TLI scores indicated that Lake Waiorongomai is in a hypertrophic state with a saturated level of nutrient enrichment. The TLI categories of 1 to 7 relate to states of wellbeing, where category 1 is an ideal score of pure water, a hypertrophic state is category 7. Likely causes of water quality decline are linked with the water quality results from the Northern and Southern drain inlets (Sites 1 and 4) which showed obvious sources of faecal and nutrient contamination. These results (Sites 1 and 4) were used as points of discussion with neighbouring land owners and farming leasees to help explain why fencing and riparian planting along these waterways would be needed to minimise the effects that farming activities are having on the lake ecosystem.

The historic water quality results from 1976 and 1977 (Table 3.2.1) do not show any particular trend or difference when compared to the same averaged, water quality data

[1231] Also known as *Stuckenia pectinate.*.

from 2013 to 2015 monitoring activities (Appendix 15). In particular, total phosphorus ranges were similar in 1976-1977 they were 0.14 to 0.789 and now 0.12 to 1.12 (mg/L=g/m3). Dissolved oxygen measurements were also similar, historic results ranged from 8.3 to 14, were more recently 8.18 to 12.27 (mg/L=ppm). Secchi measurements again had a similar historic range of 0.22 to 0.7 compared to recent 0.32 to 0.8 (metres).

Finally, if the National Policy for Freshwater Management objectives are used as an assessment criteria, then the recent average water quality results similar to the historic results showed the ecosystem at Lake Waiorongomai to be in a healthy state. Thus, while it was not possible to find significant evidence of change in water quality over time (i.e. between 1976-1977 and 2013-2015 samples), the current water quality results show that against the TLI index Lake Waiorongomai is hypertrophic.

7.4.2 The current state of macroinvertebrates in Lake Waiorongomai

Monitoring results indicate that macroinvertebrate populations are present and affected by environmental change in a way that causes measurement variability with respect to time. Questions that could benefit from further research concern the extent to which this macroinvertebrate variability is: (i) being driven by water quality changes; and (ii) affecting important food sources for juvenile eels.

7.4.3 The current state of fish in Lake Waiorongomai

The dominant fish species in Lake Waiorongomai and Waiorongomai Stream is the common bully. It is difficult to comment on the state of fish populations in Lake Waiorongomai from these initial count results. However, the question of fish population wellbeing is likely to feature as a future research topic because, as Caleb Royal has suggested, “a healthy fish community would produce greater growth rates in

tuna (eels) through their transition in their feeding habits from invertebrates to fish."[1232] Catches of short fin eels provide evidence of good external health while internal examination revealed red worm parasites in the gut lining. These monitoring results concerned local whānau and hapū because the eating of unhealthy individual eels is considered to have an accumulating unhealthy effect on those consuming them.

Although exotic fish were not found during monitoring, unidentified exotic fish are still or have been present, for example those caught in a hīnaki in 2011, and further anecdotal evidence from kaumātua[1233] suggests goldfish[1234] and silver perch[1235] are present. Future fish monitoring could provide the scientific evidence that supports these kaumātua observations. Notably, the purpose of future monitoring is not to prove something which we know to be true.

7.4.4 The current state of invasive species

The discovery of the hornwort (*Ceratophyllum demersum*) during the first eel monitoring event (mid-February 2013) led to the inclusion of Dissolved Oxygen measurements in the water quality monitoring programme. The prolific growth of these submerged weeds can create extremely low dissolved oxygen levels during the night and the early hours of the morning, leading to fish mortalities. The water quality baseline monitoring results showed that during summer dissolved oxygen levels and water temperature fluctuations were extreme at night. It is likely that this would cause stress to sensitive fish species. Furthermore, the abundance of some fish species like eels is very likely to be affected by these significant seasonal stresses. The New Zealand National Policy Statement for Freshwater Management 2014 (amended 2017)

[1232] Royal, C., February 2013, Lake Waiorongomai tuna monitoring report, Waiora Solutions Ltd prepared for Ngā Hapū o Ōtaki and GWRC, p. 5. (unpublished report)
[1233] Elders.
[1234] U. Carkeek, personal communication, 13 June, 2015.
[1235] R. Waaka, personal communication, 13 June 2015 and video evidence, 10 April 2011.

has a bottom line of 4mg/L dissolved oxygen levels for rivers as the lowest daily minimum across the whole summer period.[1236] The dissolved oxygen results presented in this doctoral thesis are presented in ppm which is equivalent to mg/L. Both summer monitoring periods showed that 24 hour dissolved oxygen readings were below the accepted bottom line (i.e. 3.15mg/L in 2014 and 0.783mg/L in 2015). As the national policy for freshwater states the likely effect on the freshwater ecosystem for these levels of dissolved oxygen readings is "Significant, persistent stress on a range of aquatic organisms caused by dissolved oxygen exceeding tolerance levels. [There is a] Likelihood of local extinctions of keystone species and loss of ecological integrity."[1237] This situation is of deep concern to the whānau and hapū of Lake Waiorongomai.

The hornwort population in Lake Waiorongomai fluctuated with large die backs occurring in late summer. This noxious aquatic weed still remains a priority and options such as grass carp and herbicides are being considered by the whānau and hapū of Lake Waiorongomai. "The presence of this noxious lake weed (hornwort) could alter the chemistry and subsequent quality of the water which could ultimately change the invertebrate community in the lake. If this occurs, the good growth experienced by juvenile tuna (eels) could decline."[1238] Discussions and emails considering hornwort eradication or management options have begun with Paul Champion, Principal Scientist for Freshwater Ecology at the National Institute of Water and Atmospheric Research Ltd.[1239]

[1236] Ministry for the Environment, 2017, pp. 37-38.
[1237] Ibid, p. 38.
[1238] Royal, C., February 2013, Lake Waiorongomai tuna monitoring report, Waiora Solutions Ltd prepared for Ngā Hapū o Ōtaki and GWRC, p. 5. (unpublished report)
[1239] P. Champion, personal communication, 16 August 2017 and 11 September 2017.

7.4.5 The current state of tuna in Lake Waiorongomai

Initial eel monitoring in February 2013 found numerous small eels with an average size of 365.9g which is not suitable for customary harvest. In commenting on these results, Caleb Royal explained that:

> Only two tuna (eels) were over 500g in weight. The preferred preparation technique for tangata whenua[1240] is pāwhara[1241] or raurekau[1242]. Tuna (eels) need to be over 500g to be suitable for this preparation technique. In this respect, the health of the tuna (eel) fishery in Lake Waiorongomai is poor when assessed against Māori customary values. This does not mean that the fishery is not valued, but is a statement around the health of the fishery to meet the customary requirements for tangata whenua[1243].[1244]
>
> The most significant finding in this (September 2013) monitoring exercise is the dramatic shift in the observed size classes. Previous monitoring events found that around 90% of the captured tuna (eels) were in the small category (<400g), very few medium size class (400-700g) and almost none in the large category (>700g). This monitoring event provided quite a

[1240] People of the land.
[1241] Hanging, filleting by splitting down the backbone, removing the internal organs, salting and drying in a traditional Māori process.
[1242] Eel grilled while wrapped in the leaves of *Coprosma grandifolia*.
[1243] People of the land.
[1244] Royal, C., 2013, Lake Waiorongomai tuna monitoring report: February 2013, Waiora Solutions Ltd prepared for Ngā Hapū o Ōtaki and GWRC, p. 5. (unpublished report)

different picture with around 50% small tuna (eels), nearly 40% medium, and 10% large tuna (eels). [1245]

Although the change reported here is significant there are a number of reasons which may have contributed to this measured difference, such as seasonal change, tidal influences, water quality variances, maramataka[1246], and differences in sampling technique. The eel monitoring events did provide "an opportunity for tuna (eels) to be gathered and used for customary practices. It is worth noting that the sample taken for aging were processed for eating and were well received by kaumātua (elders) at a subsequent hui (meeting/gathering/event)."[1247] Analysis of otolith growth rings suggests that the growth rate of eels has been inhibited in their adult stage of development. This could be due to: the reduction in the extent of surrounding ephemeral wetlands; shifts in food sources; water quality variances; and the loss of plants in the riparian zone. Thus the restoration project is envisaged to improve the growth of the taonga eel species as well as the overall biodiversity within Lake Waiorongomai.

7.4.6 The current state of threatened species within the Lake Waiorongomai restoration area

Discovery and observations of threatened native species such as the tiny button daisy, swamp buttercup, fennel-leaved pond weed, bittern, royal spoonbill, white heron, grey ducks and dab chicks are encouraging outcomes of this monitoring activity. These results suggest that these species are still able to find suitable habitat within the lake ecosystem. Of course, these few species are but a faint shadow of the biodiversity that

[1245] Ibid, p. 8.
[1246] Māori lunar calendar.
[1247] Royal, C., 2013, Lake Waiorongomai tuna monitoring report: September 2013, Waiora Solutions Ltd prepared for Ngā Hapū o Ōtaki and GWRC, p. 8. (unpublished report)

once would have been supported by Lake Waiorongomai and surrounding wetlands and dune areas. However, the current threatened species state of the lake has earned it a regional classification of an *ecosystem and habitat with significant indigenous biodiversity values*[1248] *a natural wetlands*[1249] *and key native ecosystem*[1250]. Two species of particular customary value to whānau, hapū and iwi found in the ecological monitoring program to be improving to a healthier state were whitebait and watercress. The first whitebait caught in the stream above the new culvert (11th November 2014), the second was new juvenile watercress plants found on the edges of the lake (18th January 2015).

7.4.7 Potential future research priorities

Future research could include further exploration of the freshwater mussel species kākahi *(Echyridella menziesii)*. Horima Carkeek, a Trustee of the Lake Waiorongomai 10 Trust, is one of the kaumātua that once collected this shellfish in the lake as a young man.[1251] He provided the kaitiaki team with knowledge of the location of harvest areas. Currently this location is kept private by kaumātua. Kaumātua reported that the traditional collection site had not produced any shellfish in the past five years.[1252] Evidently, this traditional location discussed with kaumātua had been a region of high cattle traffic prior to the restoration fencing.

Discussion with Caleb Royal, indicated that kākahi[1253] might be present in Lake Waiorongomai in another area that is only known to and discussed by kaitiaki and

[1248] GWRC, 2015, Proposed Natural Resource Plan for Wellington: Te tikanga taiao o Te Upoko o Te Ika a Maui, p. 353.
[1249] Ibid, p. 399.
[1250] GWRC, (embargo), Draft Key Native Ecosystem Lake Waiorongomai. NOTE: currently embargoed until this thesis is published.
[1251] H. Carkeek, personal communication 11 December 2014.
[1252] H. Carkeek, personal communication 11 December 2014 and U. Carkeek, personal communication 13 June 2015.
[1253] Freshwater mussel (Echyridella menziesii).

kaumātua members. There would seem to be reasons for the future return of kākahi. First, this area had no cattle access. Second, water flow in this area of former aquatic habitat is high which increases the provisioning of food for filter feeding species. Finally, middens surrounding this site have been observed to contain high concentrations of kākahi shells and as such suggests former kākahi habitat nearby. This potential area for future kākahi research remains private knowledge with the kaitiaki and kaumātua.

Reptiles were not monitored in these baseline measurements, however two separate sightings of brown skink within the restoration area were reported during a project-related hīkoi.[1254] Frogs were also not monitored in these baseline measurements. The only species of frogs likely to be present in this wetland environment were Australian.[1255] Given that, the kaitiaki agreed that the hapū would not be interested in the collection of that data. Frogs have been heard at the lake, and a future research endeavour could be to discover the possible role they play in the lake's food chain and broader ecological wellbeing.

It is envisaged by local kaitiaki that, following the regeneration of the vegetation in the restoration area, native fish and bird populations on the lake and surrounding wetlands will increase while exotics will decrease. It would be helpful to track this successional development with future monitoring activities to ensure that this expected outcome is actually occurring.

A long term goal of this restoration project is the return of a healthy and abundant eel population to replenish the local delicacy this lake was renowned for, also ensuring

[1254] 1 April 2013 near the lake on platform to Rupene's maimai observed by Aroha Spinks; 31 January 2014 in Waiorongomai 1A near the camp site observed by Tim Park.
[1255] A. Perrie, personal communication, 18 June 2015.

manaakitanga[1256] at the local marae. Plentiful whitebait, kākahi and watercress stocks in the future would also please whānau and hapū members as additional locally sourced food resources. Abundant native terrestrial plant species to be utilised in traditional practices such as rongoā[1257], raranga[1258], and mau rākau[1259] would be advantageous and pleasing to whānau, hapū and iwi members as well as kura kaupapa[1260] and Te Wānanga o Raukawa students.

Ongoing ecological monitoring of the type outlined in this doctoral thesis is anticipated by kaitiaki team members so as to ensure that restoration and management efforts are contributing towards the ongoing success of this Lake Waiorongomai restoration project initiative.

[1256] Hospitality, generosity.
[1257] Medicinal purposes.
[1258] Weaving.
[1259] Weaponry.
[1260] Whakatupuranga Rua Mano and Te Rito.

Chapter 8 Discussion

Hei whakaoho te mauri o Waiorongomai.

To revitalise the mauri of Waiorongomai.

This chapter provides a written synthesis of many strands of knowledge and learning relating to the Lake Waiorongomai restoration project. Synthesis is an essential component of Māori knowledge development. The western science knowledge development tradition has been primarily built upon the central role of analysis that has given rise to the creation of some 8,000-10,000 academic disciplines. It could be argued that whilst this methodological orientation has resulted in creation of breath-taking specialist (disciplinary-based) knowledge[1261], by comparison western science still struggles with complex economic-social-ecological-cultural problem solving.[1262] This could be one reason why transdisciplinarity is now rapidly emerging as a frontier of new knowledge development in western science.[1263]

By contrast, Māori culture created systems of knowledge development that emphasised the central role of synthesis. In the time of my tūpuna[1264], there were very few areas of knowledge specialisation. Individuals who were nurtured and trained in mātauranga[1265] Māori became living repositories of vast amounts of knowledge that they were able to

[1261] Cohen, E., & Lloyd, S., 2014, Disciplinary evolution and the rise of the transdiscipline, p. 192.
[1262] Maani, K., 2017, Multi-stakeholder decision making for complex problems: A systems thinking approach with cases, pp. 3-4, 13.
[1263] Cohen, & Lloyd, 2014, pp. 203, 208, 210.
[1264] Ancestors.
[1265] Knowledge, information, education.

weave together as expressions of whakapapa[1266], whanaungatanga[1267] and kaitiakitanga[1268]. Furthermore kaupapa Māori research has been reclaimed from these ancestral knowledge traditions, reframed in a modern-day context and is now being used to reinstate the wellbeing and mana of Māori culture. These are first steps in what will be, in reality, a very long journey. This context is important because kaupapa Māori research is still very much a project and process in the making. This doctoral thesis attempts to make a further, confident contribution towards Māori knowledge creation in this modern-day context.

The earlier chapters of this doctoral thesis are organised by chapter and presented in ways that give expression of Māori cultural values that guide our approach to knowledge development. As such, this thesis breaks from many western academics traditions focused around structure that moves from theory to research question, to method, results, analysis of results, discussion and conclusions. This well-established pathway can be followed by western science students because their underpinning worldview, scientific methodology and methods are well-established. By comparison, when presenting mātauranga Māori in written form, it is unwise to assume that a hapū[1269] Māori worldview does not need to be stated explicitly. It would also not be safe to assume: (i) that readers will understand kaupapa Māori research; (ii) the need to write a thesis for ones own Māori community as the first audience; and (iii) the underlying rationale behind why this written thesis is structured in a way that breaks from well-established western scientific traditions. These writing priorities partly reflect the expression of kaupapa[1270] and tikanga[1271], but also the reality that Māori

[1266] Genealogy.
[1267] Kin ship, family relationships.
[1268] Guardianship, stewardship.
[1269] Sub-tribe, clan.
[1270] Values, strategy, purpose.
[1271] Custom, obligations.

culture was in the recent past[1272], at risk of extinction. There is thus an urgent need to do everything possible to reverse a downward trend in cultural wellbeing. In writing the earlier chapters of this thesis it has been necessary to soften the analytical tradition of grouping knowledge into discrete units (i.e. thesis chapters in this case). Instead, I have attempted to understand how each chapter might give expression to Māori cultural values in a way that celebrates holistic worldview and systems of knowledge development, which are based primarily on synthesis. This is why chapters 5, 6 and 7 contain both methods and results. This is why chapter 4 embraces, compares and contrasts both kaupapa Māori and western science action research methodologies used in this project. This is why chapters 1-3 provide a whakapapa-based narrative that collectively outlines our hapū Māori worldview, whakapapa and history as necessary knowledge components that contextualise the Lake Waiorongomai restoration project. The aim of this final discussion chapter is to reflect on chapters 1-7 in a way that separates out and weaves together the crucial lessons that have emerged out of this six year hapū-led kaupapa Māori research project.

8.1 Contributions to transformative change in the Lake Waiorongomai ecosystem

Without doubt, one of the most significant contributions of this kaupapa Māori research project has been transformative change in a 'whānau Māori ecosystem'[1273] that had been in decline for a long time. The English Living Oxford dictionary online defines 'transformative' as an adjective that means "causing a marked change in

[1272] For example, Whakatupuranga Rua Mano iwi development strategy identified critical issues in 1975.
[1273] I introduce the term 'whānau Māori' to extend the English term of 'ecosystem'. The meaning 'a very large family' that includes the whakapapa connection to all natural things which is bigger than the 'ecological concept'. The term also extends beyond the scientific branch of taxonomy which is a similar classification system of identifying and categorising all living things.

someone or something."[1274] Transformative has been recently defined as: 'renewed', 'reconfigured', 'altering', 'replacing', 'reinventing', 'recombining', 'transposing' - as opposed to creating entirely new things out of nothing.[1275] In 2016, transformative change was listed as one of the four main collaborative planning approaches being used to move communities towards a sustainable future.[1276, 1277] To consider next a Māori perspective on transformation the online Māori Dictionary 'Te Aka' translates the English word 'transform' as 'whakaahua'.[1278] Whakaahua as a verb is explained to mean: 'transform', 'acquire form', 'to fashion', and interestingly it also means 'to photograph, portray and film', which is of relevance for this case study where creative artistic activities occurred alongside restoration and research activities.[1279] The construction of the word 'whakaahua' can be separated further into two parts: (i) 'whaka' which commonly means 'to cause something to happen'; (ii) 'āhua' can have several meanings depending on the context with the most relevant definitions as a verb to mean; 'to form', 'make', 'to approach', 'head towards', and as a noun; 'shape', 'appearance', 'condition', 'character', 'likeness' and 'nature'. Māori cultural values place importance on the 'appearance' and 'condition.' The condition could mean the level of mauri or the state of being 'tapu'[1280] or 'noa'[1281], all of which is relevant to this sacred site. It could be considered that local whānau[1282] and hapū were attempting to reform the ancestral landscape, cultural values and ecosystem back towards ancestral times. Therefore the use of 'transformative change' in this restoration project could be

[1274] https://en.oxforddictionaries.com/definition/transformative
[1275] Haxeltine, A., *et al.*, 2016, A framework for transformative social innovation. Cited in Avelino, F., 2017, Power in Sustainability Transitions: Analysing power and (dis)empowerment in transformative change towards sustainability, p. 509.
[1276] Along with: (i) predictive; (ii) adaptive; and (iii) visionary.
[1277] Linnenluecke, M., *et al.*, 2017, A review of collaborative planning approaches for transformative change towards a sustainable future, p. 3212.
[1278] Māori dictionary online (www.maoridictionary.co.nz)
[1279] Chapter 6.
[1280] Sacred.
[1281] Ordinary, unrestricted.
[1282] Family, extended family.

considered to enhance the appearance and condition of the Lake Waiorongomai ecosystem.

In this Māori cultural context and case study, transformative change can simply be defined as effects on whānau Māori ecosystem wellbeing and evaluated across three fundamental realms: (i) Tua-uri (i.e. the realm of mauri); (ii) Te Aro-nui (i.e. the realm perceived by human senses); and (iii) Te Ao Tua-ātea (i.e. the realm of Io Matua Kore that is beyond the time space continuum).[1283] Building on this Māori cultural definition of transformative change, the next sub-sections (8.1.1 and 8.1.2) provide evidence that transformative change occurred during the first seven years of the Lake Waiorongomai restoration project.

8.1.1 The Lake Waiorongomai whānau Māori ecosystem in 2011

In oral history interviews held at the start of the Lake Waiorongomai restoration project kaumātua[1284] and kuia[1285] remembered this sacred site as having pristine water, an abundance of wildlife and surrounding vegetation, plus a strong connection with whānau members including tūpuna Māori.[1286] At the start of this project in 2011, key issues of whānau Māori ecosystem wellbeing decline at Lake Waiorongomai included:

- strong whānau connections with the sacred site had been severed[1287] ("We used to go out… set up camp… at the mouth of the lake down on the beach side..."[1288] "For me ukaipō was about getting our whānau back on the land"[1289])

[1283] Marsden, pp. 60-62.
[1284] Elders, male elders.
[1285] Female elders.
[1286] Chapter 5, Section 5.2 and Appendix 1.
[1287] Oral interviews in Chapter 5 (Section 5.2) and Appendix 1.
[1288] John Huff, personal communication, 9 May 2013. During interview with Retitia (Betty) Raureti, John Huff and Borgia Hakaraia, 9 May 2013, at Ngā Purapura, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.
[1289] Interview with Rupene Waaka, 29 November 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.

- removal of surrounding vegetation (deforestation in the region removed large trees in the late 1880's and lower riparian vegetation removed for grazing in the 1990's,[1290] "my disappointment in the place was the last time I went out 'it looked like a lawn' the cows had eaten all the edges"[1291])
- drainage (1920's native land court records and 1970's - both occasions due to Pākehā[1292] lease arrangements to graze surrounding land blocks,[1293] "the stream had a lot more water"[1294] "…lake had effectively been drained of all its water."[1295])
- the taonga eel species populations were not as abundant[1296], the size of eels were small[1297], as well as 'flaccid'[1298] ("I would have been in my twenties out at Waiorongomai, … the eels came from the creek and wriggled across the sand – hundreds of them."[1299] "That's when the eels used to run... we used to gather them on the beach they used to go out in their millions."[1300])
- effects caused by cattle in the lake and surrounding waterways causing nutrients in the water (Figure 8.1.1), poor water quality, no longer suitable for drinking or swimming. ("… as you can see the cows are in the lake… cows doing their business in the water."[1301]) Scientific evidence in the ecological baseline monitoring, as water quality was found to be of a hypertrophic state with a saturated level of nutrient enrichment.[1302]

[1290] Chapter 3 (Sub section 3.2.6).
[1291] Betty Raureti, personal communication, 9 May 2013. During interview with Retitia (Betty) Raureti, John Huff and Borgia Hakaraia, 9 May 2013, at Ngā Purapura, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.
[1292] Non-Māori, European.
[1293] Chapter 3 (Sub sections 3.1.2 and 3.2.3).
[1294] Interview with Erna Winterburn, (date unknown), Interviewer Queenie Rikihana, Appendix 1. Source: Te Rūnanga o Raukawa Inc., 2011, Attachment 2. (unpublished report)
[1295] T. Carkeek, 13 November 2010, personal communication. Video during MTM Hīkoi.
[1296] Appendix 1 and Chapter 5 (Sub sections 5.2.3, 5.2.4, 5.2.6, 5.4.3).
[1297] Chapter 7 (Sub section 7.2.2).
[1298] This term was used by Tanira Cooper in reflection of the change in eel wellbeing. Interview with Tanira Cooper, 27 May 2016, at Whakatupuranga Rua Mano, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.
[1299] Borgia Hakaraia, personal communication, 9 May 2013. During interview with Retitia (Betty) Raureti, John Huff and Borgia Hakaraia, 9 May 2013, at Ngā Purapura, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.
[1300] Interview with Hori (George) Grey, 19 August 2013, Hadfield Street, Ōtaki. Interviewers Moira Poutama and Aroha Spinks.
[1301] T. Carkeek, 13 November 2010, personal communication. Video during MTM Hīkoi.
[1302] Chapter 7 (Sub section 7.3.1).

Figure 8.1.1 Photographs at Lake Waiorongomai that show transformative change in the landscape from 2011 through to 2017 (*Source: photo top left taken by Huhana Smith 12 March 2011, the remainder of photo's taken by Aroha Spinks, from top middle in a clockwise direction, 3 October 2015, 12 January 2017, 3 October 2017, 3 October 2017, 17 May 2016)*

8.1.2 Transformative changes in the Lake Waiorongomai whānau Māori ecosystem, in 2018

The purpose of the hapū-led restoration project and doctoral research endeavour was to help the whānau and hapū to achieve their aspirations to *enhance and restore the natural ecosystems*[1303] *present around Lake Waiorongomai, by protecting and revitalising this taonga including: its waterways, native fauna, flora and habitats.* This purpose has been successfully initiated as elaborated in this sub-section (8.1.2) and will be ongoing for generations to come. The following examples provide evidence that the

[1303] From the perspective of a Māori worldview whānau and hapū are an integral part of an ecosystem. This point is explained in greater detail in Chapter 2.

Lake Waiorongomai restoration project, during the first six years, has had positive effects and transformative change within the three realms:

- Tua-uri (e.g. "If you go to Lake Waiorongomai, you feel it, then you actually know that there has been change, the water is telling you it, the eels the way they are... still kicking strong. The mauri its just crazy. The mauri is flourishing at Lake Waiorongomai."[1304])
- Te Aro-nui (e.g. restoration activities such as completing the fencing, whānau planting days etc[1305], Figure 8.1.2, ephemeral wetlands returned[1306], "The restoration project is also reconnecting our whānau."[1307])
- Te Ao Tua-ātea (e.g. tohu[1308], "The planting and restoration activities we are doing must have an effect of improving our wellbeing on a physical and spiritual level too. Of course it must… I would like to take someone out there now to tune in."[1309])

[1304] Interview with Tanira Cooper, 27 May 2016, at Whakatupuranga Rua Mano, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.
[1305] Chapter 5 (Section 5.3) and Chapter 6 (Section 6.2).
[1306] Chapter 5 (Sub section 5.3.4).
[1307] Interview with Nick Albert, 17 November 2014, at Lupin Road, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.
[1308] Sign/s. Chapter 5, (Sub section 5.3.2).
[1309] Interview with Nellie Carkeek, 29 November 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.

Figure 8.1.2 Photographs that show examples of transformative changes in the Lake Waiorongomai ecosystem *(Source: photo's taken by Aroha Spinks, from top left in a clockwise direction, 13 September 2014, 18 May 2015, 3 October 2017, 18 January 2015, 13 October 2014)*

In 2009, prior to this doctoral research project local whānau and hapū determined vision and mission statements for the Lake Waiorongomai restoration project. [1310] Since then, significant progress has been made by the whānau and hapū towards achieving their aspirations. In doing so, they actively enhanced the wellbeing of this whānau Māori ecosystem. These transformative changes can also be identified by drawing on key comments from oral interviews and the results portrayed in this doctoral thesis:

- *Lake Waiorongomai will always be there for our uri*[1311] *of Raukawa* - The Lake Waiorongomai restoration project, fencing Waiorongomai Block 10, four local kaupapa learning institutions involved, whānau and hapū are returning regularly to the site for

[1310] Lake Waiorongomai Restoration Meeting, 14 June 2009, Te Runanga o Raukawa Inc., Otaki, Meeting minutes, p. 2. Cited in Te Rūnanga o Raukawa Inc., 2011. (unpublished report)
[1311] Descendants.

ongoing restoration activities and on occasion to whakawatea.[1312] ("We participated in the research, we are the products of the research and like history it will be ongoing. It is not closed. It will be ongoing like an open ended book for us. Like all journeys they are endless…"[1313])

- *Restoration of Lake Waiorongomai to a more healthy condition* - The wellbeing of the Lake Waiorongomai ecosystem has begun to improve, e.g. watercress on the edges of the lake[1314] and whitebait[1315] found during the baseline monitoring, watercress patch of over 4m^2 found during hīkoi[1316], less weeds within the restoration area[1317], over 100 pests caught in traps since the restoration project started[1318], ducks nesting ("Because we've fenced the lake so far back now there is all this tall grass growing to the lake edge. There are ducks now nesting there."[1319]), observation of a spotless crake[1320] in 2018[1321], over 3000 native trees were planted[1322], over 1000 harakeke transplanted[1323], cattle are no longer in waterways[1324].
- *Restoration of Lake Waiorongomai to a sustainable condition* - work in progress. Tanira Cooper spoke of teaching his nephew to catch eels by gaffing again at Waiorongomai[1325] and was also seen by the author taking a hīnaki[1326] catch of eels for a tangi[1327] at Tainui marae. ("One of the greatest moves I've seen is the regeneration…

[1312] Chapters 5 and 6.
[1313] Interview with Rupene Waaka, 29 November 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.
[1314] Chapter 7 (Sub section 7.3.6).
[1315] Chapter 7 (Sub section 7.3.3).
[1316] Excursion, walk. Observed by Roy Winterburn and Aroha Spinks, 23 May 2018.
[1317] Chapter 6 (Sub section 6.2.4).
[1318] Chapter 6 (Sub section 6.2.3).
[1319] Interview with Graham Winterburn, 30 September 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.
[1320] Also known as Pūweto and *Porzana tabuensis plumbea*.
[1321] Observed by Owen Spearpoint and Philippa Crisp from Greater Wellington Regional Council during a Key Native Ecosystem wetland condition assessment, 2 May 2018. "This wetland bird species is considered to be declining due to habitat loss." Owen Spearpoint, email, 7 May 2018.
[1322] Chapter 6 (Sub section 6.2.5).
[1323] Chapter 6 (Sub section 6.2.5).
[1324] Chapter 6 (Sub section 6.2.1).
[1325] T. Cooper, 03 October 2015, personal communication.
[1326] Eel trap.
[1327] Funeral.

The fencing is brilliant. I been there, I've seen it, it's good. With the fencing in, we will in time see bird life return, the kotuku and others will come back.")[1328]

- *Restoration of Lake Waiorongomai by protecting the lake* - fencing the entire Waiorongomai Block 10 (Figure 8.1.3). Fencing the northern drain entirely[1329] and some of the southern drain[1330]. Memorandum of understandings with leasees of Waiorongomai Blocks 3B2 and 1A.[1331]
- *Restoration of Lake Waiorongomai by ensuring that both Waiorongomai and Lake Kahuwera are restored* – Lake Waiorongomai and the remnant swamp of Lake Kahuwera have been completely fenced.[1332]

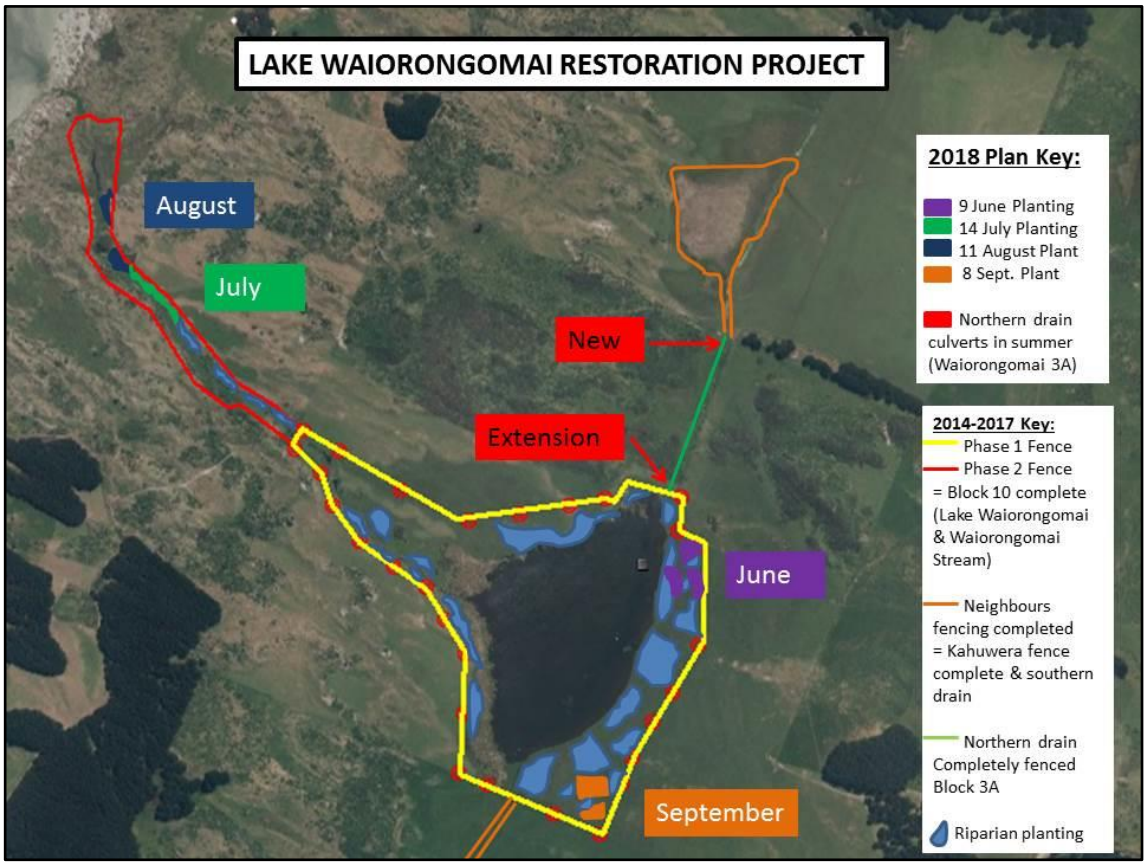


Figure 8.1.3 Lake Waiorongomai restoration project planting plan for 2018

[1328] Interview with Mickey Carkeek, 8 December 2014, at Lupin Road, Ōtaki, Interviewers Moira Poutama and Aroha Spinks.
[1329] Waiorongomai Block 3A.
[1330] Neighbouring block.
[1331] Ngā Hapū o Ōtaki, LWRP accountability reports to GWRC, 30 August 2013 (Appendix 12), 28 February 2014, 23 February 2015. (unpublished reports).
[1332] Chapter 6 (Sub section 6.2.1).

8.1.3 How was transformation made possible during this project?

Having established that transformative changes occurred during the Lake Waiorongomai restoration project it is important to consider how ecological, cultural and social transformative changes were made possible. The most important factor I would like to reflect on was that the project was hapū-led with a strong commitment and engagement by whānau and hapū members. As an iwi[1333] researcher I had essential whakapapa links to local hapū. Along with a hapū elected kaitiaki[1334] team, mentors and supervisors I embarked on initiating restoration activities and this inextricably linked doctoral research endeavour. As the researcher having a small group of guiding kaitiaki team members who had expertise, a level of authority and the main responsibility to communicate with the whānau and hapū was a crucial element to the success of the project. As the project developed, I communicated with numerous internal and external people who supported the project.[1335] I was employed by our iwi environment trust (Taiao Raukawa[1336]), which gave me flexibility to meet with external organisations, leasees, potential contracts and students during working hours, as well as whānau and hapū after normal working hours. The complexity of these relationships between the whānau, hapū, kaitiaki team and the support of the wider community is illustrated very simply in Figure 8.1.4.

[1333] Tribe, nation.
[1334] Guardian, caretaker.
[1335] Figure 6.1.1 illustrates a basic sociogram.
[1336] Te Reo a Taiao Raukawa Environmental Research Unit.

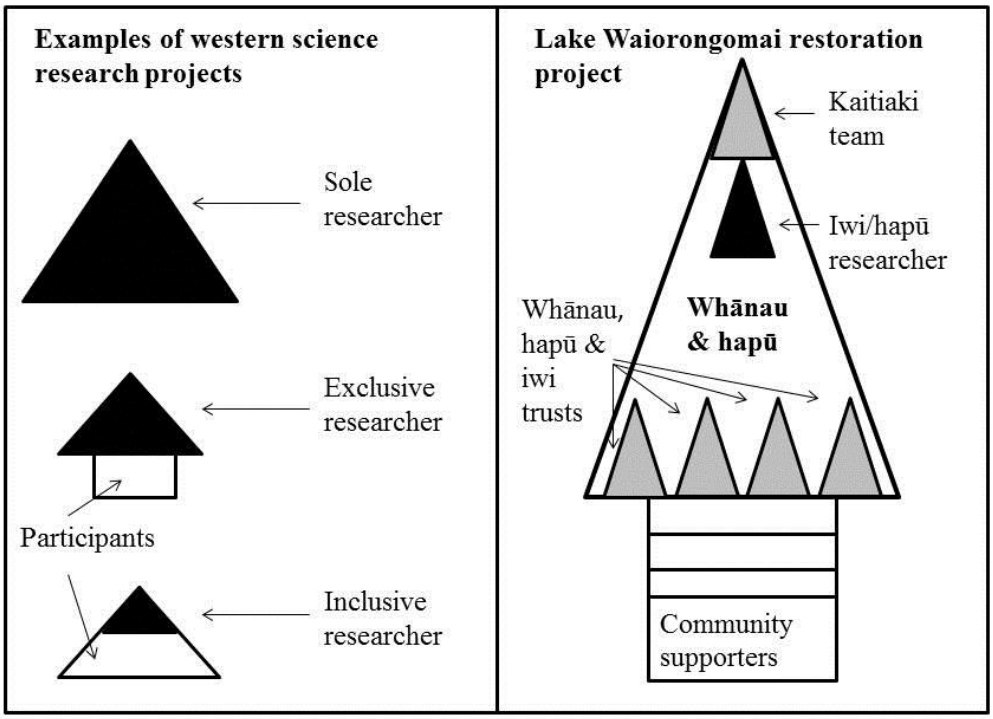


Figure 8.1.4 An illustration of relationship complexity within this hapū-led project[1337]

Another important aspect of the project that ensured transformative change was that it was conducted in accordance with local tikanga and based on whānau/hapū determined kaupapa.[1338] In my supportive role I created plans, tools and templates to assist with the organisation and implementation of the project.[1339] In addition, crucial financial support was provided by external agencies, in particular the Greater Wellington Regional Council and Kāpiti Coast District Council. Although there was an internal preference for contracts, services and advice whānau also considered external organisations and community members. Through whānau connections local kaupapa Māori learning institutes became increasingly involved, ensuring ongoing intergenerational learning.

[1337] The diagram provides a few examples of western science research approaches although it is acknowledged that complex examples also exist.
[1338] Chapter 5 (Section 5.3).
[1339] Chapter 6.

8.2 Contributions to Māori cultural survival and wellbeing

Māori thrived on the islands of New Zealand for centuries prior to the arrival of Pākehā. Through the expression of kaupapa and tikanga they lived sustainably within their environment which was abundant in fisheries, bird life and forests. Since the signing of the Treaty of Waitangi in 1840 the impacts of colonisation on Māori culture have been devastating. In 1840, Te Tiriti o Waitangi[1340] guaranteed the tino rangatiratanga[1341] of hapū and iwi over themselves, as well as their lands, forests, fisheries and other taonga.[1342] However, the Crown did not honour the guarantees within Te Tiriti o Waitangi and by introducing English common law principles and subsequent legislation they rapidly dispossessed Māori of their authority, along with almost all their lands, forests, fisheries, waterways, taonga and natural resources. This major loss of land also resulted in lost economic opportunities.[1343] Subsequently, these unfair behaviours and unwanted effects on Māori culture have been acknowledged by the Crown. The Waitangi Tribunal continues to settle grievances raised by iwi about the unfair and ecologically unsustainable behaviour of the Crown and its numerous agencies. This Treaty Settlement process currently includes Ngāti Raukawa ki te Tonga as part of the process of the Porirua ki Manawatū Inquiry district.[1344]

For my tūpuna, multiple Crown actions and failures resulted in a major loss of mana, ancestral land and natural resources. This is turn had severe, detrimental impacts on Māori cultural and social wellbeing,[1345] so much so, that by the 1890s and the turn of

[1340] The English version was translated soon after and known as the Treaty of Waitangi.
[1341] Absolute sovereignty.
[1342] Jackson, M., 1992, The treaty and the word: The colonisation of Māori philosophy, p. 5.
[1343] Lange, R., 2010, The social impact of colonisation and land loss on iwi of the Rangitikei, Manawatū and Horowhenua region 1840-1960, p. 245.
[1344] Wai 2200
[1345] Wood, *et al.*, 2017, pp. 693-694.

the 20th century it was predicted that Māori as a race would become extinct.[1346] By the 1950s, being Māori had become a negative experience and Māori were forced to assimilate into Pākehā culture in order to survive.[1347] However, in the 1970s, this process of assimilation was challenged and heavily protested by Māori who demanded "teaching of Māori language in schools, Māori control of Māori land and Māori finance".[1348] Along with an increasing Māori population, a cultural revival to reclaim, reframe and reinstate te reo[1349] Māori, kaupapa and tikanga gained momentum. Māori education strategies have been evolving ever since and will be discussed further in the next section of this thesis (8.3).

Māori cultural survival and wellbeing is inextricably linked to ecosystem wellbeing.[1350] Māori have ancestral links to the natural environment and through that reciprocal relationship they have a responsibility to care for 'Te whānau ā Ranginui rāua ko Papatūānuku' (also referred to as 'whānau Māori ecosystem' within this doctoral thesis). As discussed in Section 8.1 the Lake Waiorongomai restoration project contributed towards transformative changes by enhancing the wellbeing within this lake whānau Māori ecosystem. This section will explain how whānau and hapū in this case study enhanced their cultural, social and physical wellbeing through the expression of their kaupapa (values) and tikanga (cultural practices). Thus along with ecological improvements at the lake, these expressions of cultural values contribute to Māori cultural survival.[1351]

[1346] Durie, M., 1998, p. 53. Cited in Selby, R., 2005, Dreams are free: Nga moemoea a te hapu, p. 115.
[1347] Selby, 2005, p. 115.
[1348] King, M, 1997, 1000 years of Maori history: Nga iwi o te motu, p. 96. Cited in Selby, R., 2005, Dreams are free: Nga moemoea a te hapu, p. 116.
[1349] The language.
[1350] Fox, C., et al., 2017, p. 530; Henwood & Henwood, 2011, p. 220; Smith, S., 2007, p. 6 & 26.
[1351] Transformative changes were explained in Sub section 8.1.

The following sub-section will show how the whānau Māori ecosystem in Ōtaki was once flourishing and thus sustained local whānau, hapū and marae. Elders within our iwi continue to reminisce about the historic abundance of resources from our local waterways, lands and beaches. These memories have formed the basis of a strong desire to encourage the reinstatement of a healthy, sustainable environment that supports cultural practices.

8.2.1 The early Māori economy in Ōtaki

Memories from kaumātua and kaitiaki of Ōtaki describe a very different Māori economy'[1352] to today.[1353, 1354] It was one of subsistence living, vegetable gardens, fruit trees and gathering seafood from the beaches, fish from clean rivers and streams, an abundance of eels that were also kept in eel boxes in back-yard streams. The expression of whanaungatanga and pūkengatanga[1355] whilst gathering kai, cooking and eating together was important. Generosity was expressed by distributing food to community members, both Māori and Pākehā. Within a single generation (i.e., their lifetimes), these kaumātua and kaitiaki have witnessed devastating destruction of the environment within the Kāpiti-Horowhenua region. To illustrate this point, the following statements by Ōtaki whānau members Te Waari Carkeek and Caleb Royal have been taken from recent oral interviews:

> We were expected to work in the gardens, expected to go out and gather food, and that's what we did. All these activities were led by our father and our uncles and other cousins would

[1352] The term 'Māori economy' can be used to describe the historical use where food and other natural resources were traditionally given or traded before the introduction of money as a currency.
[1353] For example, Meretini Wipiti reminiscences in Chapter 3, Sub-section 3.1.3; Oral interview quotes in Chapter 5, Sections 5.2 & 5.4; and interviews in Appendix 1.
[1354] Similar reminiscences were made by over sixty interviewees from multiple iwi within the Porirua ki Manawatū Inquiry district. Poutama, M., *et al.*, 2017.
[1355] Teaching, learning, educating.

> come along as well as aunties… We knew the landscape, we knew where to go because we were taken there by our elders and we were taught how to go eeling, how to go white baiting, how to go fishing, how to grow food, that was pretty much taken for granted in our daily life.[1356]
>
> We've gone from families having their pātaka kai, their eels boxes in the stream that would hold eels for the year. Where you could go gather your kai, where the kids like me as a child would swim in… so you don't have that same relationship with the stream anymore. You can't go down there now and store your food in there safely… Because it's… water that's toxic. And you can't bathe in it… It's a disgrace really.[1357]

Lake Waiorongomai was historically a sacred place[1358] and respected as a food basket for local whānau, hapū and marae.[1359] Oral interviews specifically recorded on the topic of Lake Waiorongomai, captured understanding about its cultural significance and role in maintaining associated cultural practices.[1360] The following quotes are provided here as examples to illustrate the points:

> A bit like a dream, a beautiful place... A place that meant a lot to us, from our history, where battles were fought, where lines were drawn, where memories were made… A sacred place

[1356] Interview with Te Waari Carkeek, 01 June 2016, at Te Papa National Museum, Wellington, Interviewers Moira Poutama and Aroha Spinks. In Poutama, M., *et al.*, 2017, pp. 139-140.
[1357] Interview with Caleb Royal during the Ngāti Pare Wānanga, 26 May 2016, at Taaringaroa, Ōtaki, Interviewer Mahina-a-rangi Baker. In Poutama, M., *et al.*, 2017, p. 126.
[1358] Chapter 1 (Sub section 1.3.2).
[1359] Chapter 3.
[1360] Chapter 5 (Sections 5.1 and 5.3) and Appendix 1.

> because of where it is placed because of its name… it holds a special place in many hearts and mine too.[1361]

> Aunty Kiripuai too told us that the kawa of the tuna heke was that it was not to cut the eels up on the plate but to leave them whole so people could take what they wanted.[1362]

> When I think of Waiorongomai I think of my brother Digger because he went out constantly in his truck and with all of his children. If it wasn't for him and all the eels he caught – I don't know how we would have survived quite frankly… They would pāwhara them and hang them on the line.[1363]

In recent decades the ecological state at Lake Waiorongomai was in serious decline and the impacts of grazing were taking their toll. This had the effect of fewer whānau and hapū members visiting the site for cultural purposes. Whānau and hapū members were well aware of the associated ecological, social and cultural decline issues.[1364] In the 1990's, local whānau and hapū members had: (i) conducted a number of hui[1365] dedicated to a proposed restoration project; (ii) sought internal and external expert advice; and (iii) received initial funding.[1366] Due to a number of circumstances the restoration project had not been initiated on site until this doctoral research endeavour began. Reminiscences of Lake Waiorongomai along with strong whānau and hapū aspirations led to the restoration project gaining support from our iwi environment trust

[1361] Interview with Ariana Te Aomarere, 17 December 2013, at Iti Street, Ōtaki, Interviewer Aroha Spinks.
[1362] Appendix 1.
[1363] Appendix 1.
[1364] Chapter 3 (Section 3.2).
[1365] Meeting, gather.
[1366] Chapter 3 (Sub section 3.1.3).

(Taiao Raukawa) and myself working on the Manaaki Taha Moana (MTM) research programme.[1367]

The Lake Waiorongomai restoration project, my doctoral research endeavour and this doctoral thesis are inextricably linked. Combined, they have contributed to the cultural survival and wellbeing of my whānau, hapū and iwi. The collective statement of intent for this doctoral thesis will be elaborated upon in the following sub-section:

> A kaupapa Māori research approach to the planning and restoration of Lake Waiorongomai for the cultural benefit and survival of whānau, hapū and iwi.[1368]

8.2.2 Contributions to cultural survival made by the Lake Waiorongomai restoration project and doctoral research endeavour

Beginning with reflection on the statement of intent above, this section will then show how the planning and restoration activities of the Lake Waiorongomai restoration project contributed to the cultural survival of whānau, hapū and iwi. The project contributed towards Māori cultural wellbeing by extending our expression of kaitiakitanga into new domains. For example, the restoration activities started by protecting our culturally significant and sacred site (Lake Waiorongomai) with a robust fence. With the lake restoration area established, further restoration activities and ecological enhancements began (Section 8.1). The Rikihana papakāinga, another culturally significant site, was included in the fenced restoration area, while efforts were also made to remove boxthorns in this area to re-establish the camping site for whānau in the future.

[1367] Chapter 1 (Section 1.2).
[1368] T. Carkeek and R. Waaka, personal communication, 06 November 2015.

In order for our cultural enhancement to occur it is important that our whānau, hapū and iwi, live in a healthy state. It is a well-established understanding that if we enhance the wellbeing of our ecosystem (to which we are inextricably linked) we enhance our own wellbeing (Figure 8.2.1). So I will now focus on presenting evidence that the Lake Waiorongomai restoration project made significant contributions to enhancing the wellbeing of whānau and hapū.

Figure 8.2.1 Transformative change enhancing the wellbeing of a whānau Māori ecosystem. Photo's top left in a clockwise direction, the northwest dune ridge alongside Lake Waiorongomai before planting, the whānau planting, the plants at the completion of the whānau planting, the plant growth a year later, whānau rowing the plants over on the morning of the planting day, (centre) plants again at the completion of the planting day (*Source: photo's taken by Aroha Spinks, top left 18 January 2015, planting day photos 10 October 2015, bottom two photo's 7 July 2016*)

Our Māori cultural identity is interwoven with our language, kaupapa and tikanga. The Lake Waiorongomai restoration project enhanced the cultural identity of local whānau and hapū by providing an opportunity for the expression and use of te reo Māori,

kaupapa and tikanga. Language is a very important aspect of transmitting cultural knowledge and thereby contributes to cultural survival. During planting events, whānau were heard speaking to their tamariki[1369] in te reo Māori. The use of te reo was a significant aspect of hīkoi with the local kura kaupapa[1370] and kohanga reo[1371] students. Te reo Māori was used at wānanga[1372], hui and hīkoi during karakia[1373], mihi[1374] or pōwhiri[1375] - conducted when deemed appropriate.

The Lake Waiorongomai restoration project created a lot of opportunities for whānau and hapū members to conduct cultural practices in accordance with traditional tikanga and kaupapa. At least three whānau members have returned to whakawātea[1376] themselves in the waters of Lake Waiorongomai. Restoration activities[1377] and doctoral research activities[1378] saw the establishment of tikanga through use of karakia for all new visitors to the lake. Doctoral research activities such as the ecological monitoring also enhanced opportunities for cultural practices. For example, eel[1379] monitoring: (i) gathered important information for whānau; (ii) used hīnaki[1380] modern apparatus' based on Māori tradition; (iii) was often conducted with an adult, as well as an elder overseeing and children who also learnt during the experience; and (iv) provided opportunity for some eels to be taken and prepared in traditional ways and shared with whānau. These aspects of this monitoring exercise have contributed towards cultural wellbeing. The collage in Figure 8.2.2 shows contributions to enhancing cultural wellbeing within the Lake Waiorongomai restoration project.

[1369] Children.
[1370] Māori medium schools.
[1371] Māori medium preschools.
[1372] Learning, workshop, seminar.
[1373] Prayer/s.
[1374] Acknowledge, thank.
[1375] Welcome ceremony on a marae.
[1376] Cleanse.
[1377] For example, fencing, planting, weed and pest control.
[1378] For example, ecological monitoring.
[1379] Also known as Tuna as well as Anguilla australis and Anguilla dieffenbachia.
[1380] Meaning a net similar to a fyke net, designed to trap eels.

Figure 8.2.2 Photographs at Lake Waiorongomai that show enhancement to cultural wellbeing. Photo's clockwise from top left - Whaea Nellie Carkeek with Te Ahumairangi Hapeta in the background at the first wānanga, Rupene Waaka providing a kaitiaki perspective and local history powerpoint presentation to Vic Uni LA students in the kitchen at Raukawa marae during MTM wānanga, Kelly Tahiwi and her son during a whānau planting day - as the principal of He Iti Nā Mōtai she was preparing for their hīkoi, Graham Winterburn and Pat Hakaraia whanau planting day, kaumatua including Uncle Duffy overseeing the planting day as Peter Goodyear is planting, the macrocarpa tree that marks the historic Rikihana eel papakāinga now reinstated as the camping spot for whānau, TWOR student engaging with the sacred site on a spiritual level (*Source: taken by © Te Kawa Robb, 22 July 2017*), my nephews practicing taiaha (a weapon) with the fish monitoring equipment which was soon followed with a haka, the He Iti Nā Mōtai tamariki singing at the end of their wānanga/hīkoi to Lake Waiorongomai. (*Source: all photo's other than the one by Te Kawa Robb were taken by Aroha Spinks clockwise from top left, 23 February 2014, 06 March 2014, next four photo's 13 August 2016, n/a, 07 November 2016 and centre 14 September 2016*)

The increased restoration of Lake Waiorongomai in time is envisaged to also enhance biodiversity health such as the size and abundance of eels and other fish within the lake and surrounding waterways, native birds and customary resources (e.g. harakeke, raupō, watercress).[1381] Enhancing biodiversity in the lake ecosystem aims to reinstate the opportunities for whānau and hapū to sustain their culture and cultural identity through

[1381] Chapter 7.

the use of natural resources in cultural practices. Increasing taonga species (e.g. eels) will assist hapū in the expression of manaakitanga[1382] and other kaupapa, thus enhancing the mana of their marae and iwi. The expression of kaupapa (our cultural values) during this project was also very important and aided wellbeing and ongoing cultural survival of whānau, hapū and iwi (Sub-section 8.2.3). As the restoration project continues on past this doctoral research endeavour, such combined efforts aid in reinstating the whānau Māori ecosystem and Māori economy in Ōtaki, which will in turn enhance whānau wellbeing and cultural survival.

8.2.3 How were contributions to Māori cultural survival achieved?

In reflection, strong commitment and involvement by whānau and hapū members in the revitalisation process, which was in accordance with their kaupapa and tikanga, successfully contributed to cultural wellbeing and survival. The involvement of whānau and hapū members in the planning and restoration activities reconnected them with their ancestral landscape including for some, their marae and whānau. When they attended wānanga and hui at the start of the project to workshop and lay out their aspirations, they also brought knowledge contributions to the project. Hīkoi[1383] and restoration activities[1384] physically and spiritually reconnected whānau and hapū members with their sacred site, whilst involving them in physical excursion that also enhanced their health. Participating in wānanga, hīkoi and restoration activities was positively uplifting for all involved in the project, and social interactions among whānau were important. Some whānau mentioned that, prior to the restoration project, they had mainly been returning to their marae for tangihanga[1385]. By contrast, at one of the whānau planting days, they referred to collective planting experiences as a 'family

[1382] Hospitality, generosity.
[1383] For example, planning fence lines, restoration project wānanga, monitoring.
[1384] For example, fencing and planting.
[1385] Funerals.

reunion' or 'hauora hui' (meetings to improve health).[1386] Thus, whānau perceived that the restoration project provided many opportunities to enhance the wellbeing of our whānau and hapū members on spiritual, cultural, physical, social and psychological levels. The enhancement of physical and social wellbeing has been captured in photographs used in this thesis including in Figure 8.2.3.

Figure 8.2.3 Photographs at Lake Waiorongomai that show aspects of physical and social wellbeing within the participants. Photo's from top left in a clockwise direction. Whānau preparing holes, at the following whānau planting day these are filled with plants for example Rolly Raureti on the right hand side, exhausted but happy planters about to catch a lift back to their vehicles – include Huhana, Moira, Erena, tui, Piki and Erenas daughter, myself; Matt Saywell with Awhina and Kiinui, TWOR students Erena and Hapi at planting day, TWOR students 2017 (*Source: taken by © Te Kawa Robb, 22 July 2017*) (*Source: all photo's other than the last one by Te Kawa Robb were taken by Aroha Spinks, from top left in a clockwise direction, 15 July 2014, 13 September 2014, 13 September 2014, 10 August 2016, 13 September 2014*)

An important aspect of this restoration project as a contribution to cultural survival was continuity (i.e. the intergenerational involvement of their people). Whānau and hapū

[1386] 13 June 2015.

encouraged the participation of all ages in as many aspects of the project they could. Graham Winterburn drew attention to the contribution made by children who had been actively involved in the whānau planting as a significant contribution to ensuring the cultural survival of our whānau, hapū and iwi.

> It's good to see some of the whānau at the planting days that you haven't seen for a while. It is good to see the young guns there. There was a lot at one planting. We had a heap of young kids there. That's the way to get things done. The young ones are spending too much time on computers these days and not getting outdoors as much.[1387]

As the restoration project evolved, there was an increased awareness and interest from local kaupapa learning institutes to include their students. This is also discussed in the next section (8.3). Student involvement from the Wānanga Māori[1388], two local Kura Kaupapa Māori[1389], and a kohanga reo[1390] expanded teaching activities, whilst inspiring more adults and children of other iwi to be engaged.

A final contribution to cultural wellbeing and survival is how this doctoral thesis might potentially reach a wide audience. This narrative about the Lake Waiorongomai restoration project is a further contribution to overall Māori cultural survival and enhanced wellbeing. This is an important factor considered when whānau and hapū of Ōtaki contemplated and decided upon the issue of whether to embargo this thesis or not. They concluded that it should not only be a historic record for themselves, but useful for

[1387] Interview with Graham Winterburn, 30 September 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.
[1388] Māori tertiary institutions.
[1389] Māori medium schools.
[1390] Meaning language nests the name given to te reo Māori medium preschools.

their future generations. By providing open access to this doctoral thesis, they hoped that it might also assist, inspire and/or guide other iwi in their restorative activities.

8.3 Whānau and hapū contributions to knowledge development

The aim of this section is to focus attention on the contributions to knowledge development made during this Lake Waiorongomai restoration project and doctoral research endeavour by whānau and hapū. To synthesise, it is first necessary to carefully define what is encompassed by the idea of contributions to Māori knowledge development. These categories can then be used to better understand the nature of whānau and hapū contributions to the knowledge development made in this project. There are three classes of Māori knowledge that are all relevant to the Lake Waiorongomai restoration project. However, it is important to note that these knowledge entities only focus attention on one small part of a much larger and more complex Māori worldview conception of knowing that is also relevant to this project.

The English word 'knowledge' can be translated into te reo Māori by making reference to three different types of knowing: mōhiotanga, mātauranga and māramatanga.[1391] Mōhio as a verb translates as to: know, understand, realise, recognise and comprehend. As a noun, mohiotanga translates as: knowledge; wisdom; clever person; knowledgeable person; expert. Mātauranga as a noun translates as: knowledge; wisdom; understanding; skill; scholar; intelligence; academic; education. Māramatanga as a noun translates as: enlightenment; insight; understanding; light; meaning; significance; brainwave.

Another Māori concept that is relevant to the English word 'knowledge' is 'mātauranga Māori'. This expression is translated by Te Aka as 'Māori knowledge', being "the body

[1391] Māori dictionary online (www.maoridictionary.co.nz)

of knowledge originating from Māori ancestors, including the Māori world and perspectives, Māori creativity and cultural practices."[1392] There is a strong desire in local Ōtaki whānau to revitalise Māori language and culture based on mātauranga Māori within our community.

In New Zealand, early Crown legislation and policy combined with Pākehā settler influences lead to the marginalisation of mātauranga Māori, te reo Māori and associated cultural practices. For example, the 1867 Education Act introduced compulsory education for Māori children that was to be conducted in English. The early model of state education was coupled with a Māori language suppression policy that contributed to Māori language decline from 92% of new entrant Māori school students in 1900 to 24% in 1960.[1393] Because language is a primary means of transmitting cultural knowledge, language decline moved Māori culture to also decline. Paulo Freire pointed out that transformative change starts with language, which is the basis for conceptualisations of the world, which then in turn provide opportunity for learning.[1394]

In the 1970s and 1980s, major decolonisation movements within the Māori education sector gained momentum and led Māori to establish Te Kohanga Reo[1395], Kura Kaupapa Māori[1396], Wharekura[1397], and Wānanga Māori[1398]. These kaupapa Māori approaches to education were primarily based on 'tino rangatiratanga' (i.e. the self-determination of Māori culture by Māori).[1399] Decolonisation movements continued within the New Zealand Scientific Academy. For example, in the late 1990s kaupapa Māori research

[1392] Māori dictionary online (www.maoridictionary.co.nz)
[1393] Marsden, 2003, p. 132.
[1394] Freire, 1993, pp. 68-109.
[1395] Language nests (the name given to te reo Māori medium preschools).
[1396] Māori medium schools with a kaupapa Māori curriculum.
[1397] Māori medium secondary schools with a kaupapa Māori curriculum.
[1398] Māori tertiary institutions.
[1399] Bishop, 1996b; Durie, M., 1995b; Durie, M., 1998; Pihama, L., *et al.*, 2002; Smith, G., 1997; Smith, L., 1999.

became more acceptable and continues to develop and expand.[1400] Within Ngāti Raukawa ki te Tonga and as early as the 1970s, initiatives like *Whakatupuranga rua mano – Generation 2000*[1401] introduced plans and initiatives to promote the survival of our iwi Māori language, culture and the need for education as essential pre-requisites for self-determination.

Important as these dimensions of knowing are to Māori and this project, they are still only a small part of a much larger Māori worldview perspective on knowing that linked to 'Nga kete o te wānanga' (i.e. the three baskets of knowledge). Tānemahuta[1402] is said to have ascended the twelve heavens to gain the three baskets of knowledge known as 'te kete tuauri' (the basket of sacred knowledge), 'te kete tuatea' (the basket of ancestral knowledge) and 'te kete aronui' (the basket of life's knowledge). 'Te kete aronui' is particularly relevant to this case study and so described here in detail. Kete aronui is defined by Te Aka dictionary as the "basket of knowledge of aroha (love), peace and the arts and crafts which benefit the Earth and all living things... This basket relates to knowledge acquired through careful observation of the environment. It is also the basket of ritual, of literature, philosophy and is sometimes regarded as the basket of the humanities."[1403] Contributions to knowledge in the Lake Waiorongomai restoration project and doctoral research endeavour can be grouped into kete aronui categories including: (i) observations of the environment[1404]; (ii) restoration activities that benefited the whānau Māori ecosystem; (iii) ritual[1405] practices; and (iv) philosophy[1406]. However, it is important to note that the English word 'knowledge' is a translation abstraction of a more complex Māori cultural concept.

[1400] Also see Chapter 4, Section 4.2.
[1401] Winiata, 1979, pp. 1-9.
[1402] The Atua (God) given dominion over birds and the trees of the forests.
[1403] Te Aka Māori-English, English-Māori Dictionary and Index: available (www.maoridictionary.co.nz).
[1404] Chapter 7 and Chapter 8 (Section 8.1).
[1405] For example, karakia and mihi.
[1406] For example, the doctoral research endeavour and contributions to theory to be discussed in 8.5.

Māori knowing linked with mōhiotanga, mātauranga and māramatanga primarily focus attention on the development of knowledge within te kete aronui (i.e. the basket of knowledge) discussed in this section (8.3). As this case study also made contributions to methodology and method the influence of knowledge contained within te kete tuatea will be discussed in section 8.4. Contributions made to theory during this case study has relevance to knowledge within te kete tuauri and is therefore explored in section 8.5. However, through the expression of kaupapa and tikanga, whānau and hapū have direct access to Tua-uri (i.e. the realm of māuri), Te Aro-nui (i.e. the realm perceived by human senses) and Te Ao Tua-atea (i.e. the realm of Io Matua kore that is beyond the time space continuum).

8.3.1 Revitalising Māori knowing and knowledge development in Ōtaki (1975 -2018)

In 1975, *'Whakatupuranga Rua Mano – Generation 2000'* was a 25 year tribal development plan established by the Raukawa Marae Trustees to ensure cultural survival. The Raukawa Marae Trustees represent a confederation of three iwi that have whakapapa links and historic events that connect them to each other and Ōtaki. These three iwi are Ngāti Raukawa ki te Tonga, Ngāti Toa Rangatira and Te Āti awa.

The guiding principles of *Whakatupuranga Rua Mano – Generation 2000* are:

- The people are our wealth; to develop and retain
- The Māori language is a taonga; to halt its decline and revive
- The marae is our principal home; maintain and respect it
- Self determination[1407]

[1407] Presentation by Petina Winiata in association with Turoa Kiniwe Royal, Leaders Are Made Not Just Born – Planning for Leaders And Leadership succession: Whakatupuranga Rua Mano – Generation 2000 A Case Study. Available online (http://www.firstfound.org/Vol.%207New_Folder/winiata.htm)

In 2018, *Whakatupuranga Rua Mano – Generation 2000* has resulted in outstanding achievements and many of the whānau and hapū of Lake Waiorongomai have been and continue to be involved in and committed to this strategy for example, as students, parents, teachers or employees of the Māori learning institutions in Ōtaki. These educational institutions were involved in the Lake Waiorongomai restoration project.

Te Wānanga-o-Raukawa was established by the Raukawa Marae Trust in 1981 and is guided by the principals of *Whakatupuranga Rua Mano – Generation 2000*.[1408] This learning institution uses a distinctively Māori approach to tertiary education founded on tikanga and kaupapa tuku iho[1409]. Te Wānanga-o-Raukawa is a significant expression of self-determination.

> Rangatiratanga and its exercise are deeply set within tikanga Māori.[1410] Māori are in recovery mode from the loss of knowledge of tikanga Māori… The restoration, refinement and enhancement of tikanga Māori and its embodiment in all aspects of the affairs of Te Wānanga-o-Raukawa will be ongoing. The journey has started and it will be a long one.[1411, 1412]

Te Kura-ā-Iwi o Whakatupuranga Rua Mano (Whakatupuranga Rua Mano) and Te Kura Kaupapa Māori o Te Rito (Te Rito) were both established in Ōtaki, in 1995. They are strongly committed to teaching school children aged 5-17 years in te reo Māori. He Iti Nā Mōtai is a Māori immersion learning institute that caters for young children aged 9 months to 6 years of age. It is located on the campus of Te Wānanga-o-Raukawa in

[1408] Te Wānanga-o-Raukawa website (www.wananga.com).
[1409] Values passed down from our ancestors.
[1410] Te Wānanga-o-Raukawa, date unknown, Part One: Te Wānanga-o-Raukawa the theory (and understandings of wānanga, p. 7. Available online, retrieved from: https://www.wananga.com/user/inline/3/theory_and_understanding_of_wananga.pdf
[1411] Adapted from the theory (and understanding) of wānanga, by Professor Whatarangi Winiata, 2001.
[1412] Ibid, p. 10.

Ōtaki. The practices of this educational institution are guided by principles based on Te Ao Māori concepts and Raukawatanga[1413].

Whakatupuranga Rua Mano – Generation 2000 and the four Māori immersion learning institutions which stemmed from it influenced the Lake Waiorongomai restoration project and doctoral research endeavour. In reciprocity, the restoration project and doctoral research also contributed to the knowledge development of students and teachers from these institutions. This reciprocal relationship is explored next.

8.3.2 Evidence of contributions to knowledge development made by the Lake Waiorongomai restoration project and doctoral research endeavour

This section attempts to show that the Lake Waiorongomai restoration project primarily provided opportunities for knowledge development in the domain of te kete aronui (i.e. observations of the environment, restoration activities, ritual practices and philosophy).

8.3.2.1 Mātauranga

Whānau utilised the restoration project to transmit their mātauranga and teach younger member skills. For example, Libby Hakaraia taught her niece, Eva Hakaraia, outdoor filming techniques.[1414] Eva's film *I love Waiorongomai* won a national award and went on to be shown at an international film festival.[1415] Consistent with the atua[1416] experiences of our tūpuna, the restoration project planting days and hīkoi provided wonderful opportunities for learning by observation from: (i) the environment; (ii) the expression of kaupapa and tikanga (e.g. ritual practices) by fellow hapū members; and (iii) the expression of kaupapa and tikanga by atua Māori (Figure 8.3.1).

[1413] The cultural understandings and practices of Ngāti Raukawa ki te Tonga.
[1414] Chapter 6 (Sub section 6.3.3).
[1415] http://www.theoutlookforsomeday.net/winning-films/?search=1&genreid=&tagid=&keywords=waiorongomai
[1416] God/s, deities.

Figure 8.3.1 Te Kura-ā- iwi o Whakatupuranga Rua Mano kura students observing the environment as they get creative with sketching during the Rae ki te rae wānanga. Photo's from top left in a clockwise direction, Te Tahi Takao –art teacher, two photos of students sketching, Wai Famillton from Wellington City Gallery on the left and English teacher Cath Whiting on the right, students gathering inspiration. (*Source: photo's taken by Aroha Spinks, 19 November 2013*)

As the Lake Waiorongomai restoration project evolved, the number of learning institutes that were involved in the project also grew. Hapū member Deanna Rudd commented during a wānanga, "Lets involve the kura as, the whānau are the kura and the kura are the whānau."[1417] This point is important because the four local learning institutes (Te Wānanga o Raukawa, Whakatupuranga Rua Mano, Te Rito and He Iti Nā Mōtai) that attended wānanga and hīkoi are strongly committed to mātauranga Māori and cultural survival. The restoration project provided learning opportunities for students of all ages to partake in our ritual practices as well as to learn about the practical application of kaitiakitanga.

[1417] D. Rudd, personal communication, 15 July 2015.

Teenage students from Whakatupuranga Rua Mano and Te Rito enjoyed wānanga and hīkoi that included opportunities to learn about pūtaiao (i.e. Māori science); toi (i.e. Māori creative arts); and hauora (i.e. physical education/wellbeing). Young children from He Iti Nā Mōtai engaged in planting and enjoyed observing the aquatic insects and worms in the mud. As for all new visitors, karakia was conducted before the tamariki entered the restoration area and, on completion, they sang (Figure 6.3.5). Children went on to work on a project involving creating habitats for mokomoko[1418] at Lake Waiorongomai.

8.3.2.2 Mōhiotanga

Wānanga held during the Lake Waiorongomai restoration project included local kōrero and presentations from kaitiaki and external supporting personnel who shared their knowledge by creating opportunities for hands-on (action) learning on-the-ground.[1419] In this way, restoration tasks were learnt by whānau, including myself (Figure 8.3.2). As Rupene Waaka commented "we are all green horns at this… with the team we have had it's been very very successful".[1420] By repeating whānau planting days throughout the winter months of each year, this led to enhanced mōhiotanga of whānau as they passed on their acquired knowledge to new attendees.

[1418] Skinks.
[1419] For example, LWRP Wānanga, 23-24 February 2014.
[1420] Interview with Rupene Waaka, 29 November 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.

Figure 8.3.2 Whānau and hapū members learning opportunities during the Lake Waiorongomai restoration project. Photo's from top left in a clockwise direction (*Source: all photo's taken by Aroha Spinks, from top left in a clockwise direction, 13 June 2015, 15 July 2014, 13 September 2014(left),9 July 2016 (right), 17 May 2014, 19 February 2015, 13 June 2015, 14 September 2016, 13 June 2015 (centre)*)

Te Wānanga-o-Raukawa students learnt about and were engaged in ecological monitoring and riparian planting activities (Figure 8.3.3). Two quotes from two teachers illustrate the learning they gained by their students engaged in the Lake Waiorongomai restoration project.

> So my reflections were that our kids are not as frightened to immerse themselves in the science subjects. That is what I got out of it ultimately... the way we could compare whakaaro Māori and whakaaro science. Kaiao and Pūtaiao.[1421]

[1421] Interview with Tanira Cooper, 27 May 2016, at Whakatupuranga Rua Mano, Ōtaki, Interviewer Aroha Spinks.

> Lake Waiorongomai showed an authentic project driven by the kaumātua, kaitiaki and yourself [Aroha], it is so refreshing. The field trip cemented it. Going out on to the lake, the time we went out, the sun was setting, it looked golden. They got their hands into the whenua doing the plants. Even though we only did a few plants it was very very meaningful. The pictures you allowed them to take helps cement memories for them.[1422]

Figure 8.3.3 Pūtaiao students representing iwi from around Aotearoa visit Lake Waiorongomai during their studies at Te Wānanga o Raukawa in 2017 (*Source: © Te Kawa Robb 22 July 2017*)

[1422] Interview with Jessica Kereama-Stevenson, 30 September 2017, at Ngā Purapura, Te Wānanga o Raukawa, Ōtaki, Interviewer Aroha Spinks.

8.3.2.4 Māramatanga

The Lake Waiorongomai restoration project and doctoral research endeavour made contributions to whānau and student knowledge development through observations of the environment during wānanga and hīkoi to the lake. Whānau were also problem solving during the restoration project and these challenges resulted moments of māramatanga (i.e. enlightenment). For example, Roy Winterburn investigated and installed a concrete culvert that replaced a plastic culvert that buckled in 2014; and Tipi Bevan came up with the rowing solution during the 2015 flooding that transported the plants across the lake.

8.3.3 How was knowledge development achieved in this case study?

The knowledge development contribution made to this project and thesis by whānau and hapū is a really important contribution to our local Māori cultural survival and the transformative change outcomes of this project. These knowledge development outcomes were primarily achieved as a result of strong whānau commitment, as well as the whakapapa and social connections they brought to this project. In particular, whānau and hapū members participated and shared knowledge during wānanga and restoration activities. Likewise, the key role of whakapapa connections in knowledge development was demonstrated in many different ways. For example, it was through these whānau connections that the learning institutes became involved. First, Te Wānanga-o-Raukawa and Whakatupuranga Rua Mano were engaged at the start of this project because two project kaitiaki (and whānau members) were teaching pūtaiao in these institutions (i.e. Caleb Royal and Rolly Raureti). Second, teaching staff at Te Rito and He Iti Nā Mōtai were also whānau members involved in this project (i.e. Roimata

Baker and Kelly Tahiwi). Finally, the Victoria University Landscape Architect students also engaged in this project through a hapū connection (i.e. Paul Ransfield).[1423]

It was the stated desire of Ngā Hapū o Ōtaki that this project contribute towards intergenerational knowledge development outcomes achieved in accordance with local kaupapa and tikanga.[1424] Expressions of kaupapa and tikanga (e.g. wānanga, hīkoi and restoration activities) united people of all ages and provided opportunities for the sharing of knowledge. During these events, whānau with expertise in whakapapa, local history, kaitiakitanga and science were able to share their knowledge in a way that expressed generosity back to whānau and students. These kaupapa/tikanga-based learning and sharing opportunities were further enhanced with active learning experiences (e.g. applied ecology, creative artistic activities, physical restorative actions and the expression of mātauranga Māori). This restoration project will continue to contribute to (intergenerational) knowledge development and learning outcomes after this doctoral thesis is published. In particular, while this doctoral research endeavour is complete, whānau may decide to continue researching. For this reason, this thesis does not attempt to predict or outline future research priorities that may evolved from this research endeavour. This is something that hapū will define.

8.4 Methodology and method as enablers of transformative change

This section focuses on contributions to methodology and method as causes of transformative change in the Lake Waiorongomai restoration project and doctoral research endeavour. To synthesise, it is first necessary to carefully define what constitutes a contribution to Māori methodology and method. This is especially necessary because the Lake Waiorongomai restoration project was a hapū-led project

[1423] Chapter 6 (Sub section 6.1.4).
[1424] Chapter 5 (Sub section 5.3.5) and Chapter 8 (Sub section 8.2.3).

based on the local expression of kaupapa and tikanga. Kaupapa Māori research is a non-prescriptive socially-mediated knowledge-development process that is itself still in development. For this reason, it is important to be clear and explicit about the way in which I have adapted, what might be referred to as kaupapa Māori methodology to: (i) the methodological needs of this doctoral thesis; and (ii) the operational needs of this whānau Māori (dune lake) ecosystem restoration project.

Kaupapa Māori research approaches based on cultural values are gaining recognition and validity within academia in ways that are influencing an increasing number of western academic disciplines[1425], including resource and environmental planning. There are two main objectives to kaupapa Māori research: (i) to decolonise western science approaches; and (ii) to make research distinctively Māori. The first objective (i.e. decolonising praxis) is needed to undo the impacts of colonialism and liberate indigenous people from oppression. The Māori journey in decolonisation as a tool for political and western academia reform and activism gained momentum in New Zealand in the 1970s. Since that time it has focussed on Māori language revitalisation, reforms in education and (eventually) the rise of Vision Mātauranga as valid alongside western science.[1426]

The second (distinctiveness) objective of kaupapa Māori research is highlighted by Linda Smith in her statement that "research by Māori, for Māori and with Māori".[1427] This definition was elaborated by Jill Bevan-Brown[1428], who explained that kaupapa Māori research "must stem from a Māori worldview, be based on Māori epistemology

[1425] Described in detail Chapter 4 (Section 4.2).
[1426] Hutchings, J., & Lee-Morgan, J. (Eds.), 2016, Decolonisation in Aotearoa: education, research and practice; Smith, L., 2012.
[1427] Smith, L., 1995. Cited in Henry, 2000, p. 10.
[1428] Ngāti Raukawa, Ngāti Wehiwehi, Ngāti Awa, Ngai Te Rangi.

and incorporate Māori concepts, knowledge, skills, experiences, attitudes, processes, practices, customs, reo, values and beliefs."[1429]

Third, kaupapa Māori research is not just about knowledge development or theoretical advancement which is a central goal in western science. As a values-based approach, knowledge development can be considered as an indirect consequence of outcomes determined by whānau, hapū and iwi – rather than an end in its own right. The desired outcomes may be cultural, social, economic, spiritual or a mixture of these. Hinetākoha Viriaere, in her recent masters thesis in resource and environmental planning, made this point: "kaupapa Māori research must also aim to contribute to positive outcomes for Māori."[1430]

Finally, this section provides an opportunity to reflect on the relevance of 'te kete tuatea' (i.e. the basket of ancestral knowledge) to this case study. The Te Aka dictionary defines this basket of knowledge as that which relates to: war; mākutu[1431]; whaiwhaiā[1432].[1433] Te Ao Tua Ātea focuses on spiritual aspects of our reality including the tapu (sacred) lore of knowledge passed down to us by our ancestors as taonga-tuku-iho. Lake Waiorongomai is a wāhi tapu (sacred site) that was created from the act of an atua assisting a chief and amongst other things was used (in times past) for the purpose of 'whakanoa' (cleansing) warriors after battles of war (Appendix 24).[1434] Protecting wāhi tapu is a priority for many Māori communities. The spiritual domain and their associated tikanga can be delicate and complex areas for policy-makers, planners and

[1429] Bevan-Brown, J., 1998, By Māori, for Māori, about Māori – is that enough? A framework for addressing Māori knowledge in research, science and technology, p. 231.
[1430] Viriaere, H., 2015, He taonga tuku iho te whakarite kaupapa mō ngā māra kai tuturu = Living indigenous heritage: planning for Māori gardens, p. ii.
[1431] Bewitching, magical, supernatural, sorcery, spell, the use of spiritual powers to inflict physical and psychological harm.
[1432] Magical, paranormal, psychic, supernatural, witchcraft, sorcery, the use of spiritual powers to inflict physical and psychological harm.
[1433] Available online (www.maoridictionary.co.nz)
[1434] The cultural and historical context of Lake Waiorongomai as a wāhi tapu is described in greater detail in Chapter 3 (Sub-section 3.1.1).

other local authority staff to understand and relate to. This point reinforces the need for training kaupapa Māori researchers who can fill this gap.

In the next sub-sections, I use these distinguishing characteristics of kaupapa Māori research (methodology and method) to better understand the significance of the contributions made by: (i) the MTM research programme (specifically); and (ii) this restoration project and doctoral research endeavour (more generally) to the emergence of a distinctive kaupapa Māori methodology and method (i.e. practice).

8.4.1 A Māori approach to cross-cultural research - the Manaaki Taha Moana research programme in Horowhenua

As noted earlier in this thesis, the MTM research programme was a six-year programme, running from 1 October 2009 to 30 September 2015, with research conducted in two areas, Tauranga Moana region, Bay of Plenty and Horowhenua on the southwest coast of the North Island, New Zealand.[1435] MTM was a collaborative, cross-cultural research project that used mātauranga Māori and western scientific knowledge, (such as participatory modelling tools and processes) to assist iwi/hapū to evaluate and define preferred options for enhancing/restoring coastal ecosystems.[1436]

The MTM Horowhenua research activities focussed on a 17 kilometre stretch of coastline between Hōkio and Waitohu Streams, just north of Ōtaki Beach. This coastal area was once extensive with forests, full of pristine inland waterways (e.g. rivers, streams, a series of dune lakes, lagoons), wetlands and estuaries that were all abundant with food and fibre resources. The MTM Horowhenua regional case study enhanced six local (hapū prioritised) sites of which the Lake Waiorongomai restoration project was one (Figure 1.2.2). At the end of the MTM research programme Dr Huhana

[1435] Chapter 1 (Section 1.2).
[1436] www.mtm.ac.nz

Smith[1437] reflected on the methodological and method contributions made by the MTM research programme in Horowhenua:

> A range of activities were grounded by kaupapa Māori methodologies, hands-on actions to rehabilitate these once valued ecosystems and to record the narratives and aspirations of kaumātua and kaitiaki... Mātauranga Māori is a means to interpret and explain the world in which we live. It is anchored by a whakapapa reference system (interconnected genealogy) where this system of kinship illuminates tangible and intangible relationships between iwi, hapū and whānau, ancestors, lands, waterways and the natural world…[1438] Our teams and informants well understand that mātauranga Māori is a sophisticated and dynamic knowledge system, which over generations has been challenged and disturbed by misinterpretation, ignorance and disregard to its insights… The increased activity aims to readily re-connect more hapū and whanau to our customary knowledge bases that emerge from cosmological, genealogical, spiritual and natural realms. These bases have relevance to contemporary practices today by reapplying them in a different context to what our ancestors may have faced in the past... The contributions our MTM actions have made to our world, have been to grow more environmental hands-on projects to transform areas and inspire others within

[1437] Now Associate Professor and Head of School of Arts at Massey University, Wellington.
[1438] Royal, C., 1998, Te Ao Marama: The Māori World View, p. 75. (Unpublished chapter) Cited by Smith, H., 2015, Mai a Waiwiri ki Waitohu: How mātauranga Māori enhances iwi and hapū well being and ecological integrity, p. 1.

the wider Raukawa ki te Tonga and iwi and hapū affiliates' rohe.[1439]

8.4.2 Evidence that the Lake Waiorongomai restoration project made contributions to methodology and method

A complement to the strong cross-cultural orientation of the MTM research programme this MTM case study developed its own hapū-mediated methodology. This distinctive contribution to methodology and method is described below by making reference to the key attributes of kaupapa Māori research method outlined at the beginning of this sub-section (i.e. method, decolonisation, cultural distinctiveness, outcomes orientation and treatment of tapu and wairua[1440] Māori).

8.4.2.1 A distinctive (Ngā Hapū o Ōtaki) Māori cultural approach

The Lake Waiorongomai restoration project was an expression of a kaupapa Māori based on hapū kaupapa-tuku-iho (i.e. rangatiratanga, wairuatanga, kaitiakitanga, ūkaipōtanga, pūkengatanga and kotahitanga).[1441] The hapū-led restoration project used these cultural values to cross cultural boundaries[1442], knowledge systems[1443], institutional contexts and disciplines[1444]. The use of a kaupapa Māori research methodology made possible the achievement of transformative change that: (i) directly contributed to cultural survival outcomes; and (ii) indirectly contributed to knowledge development outputs (e.g. this doctoral thesis, the creation of action plans, whānau planting day checklist, wānanga budget template, bi-cultural studio).

[1439] Smith, H., 2015, pp. 1-2.
[1440] Spirit, soul.
[1441] Chapter 5.
[1442] Māori and Pākehā.
[1443] Mātauranga Māori and western science.
[1444] Resource and environmental planning, applied ecology and Māori studies.

Previous attempts to re-instate the mana of this whānau Māori (Lake) ecosystem had not successfully resulted in on-the-ground restorative actions. At the start of this project, whānau and hapū aspirations had been determined, advice on how to proceed had been sourced and initial funding had been captured. However, none of these steps had created a kaupapa Māori context in which this project could move from aspirations and good intentions, to action on the ground. The introduction of a fulltime (kaupapa Māori) researcher (myself), a guiding team of kaitiaki, substantial funding and the use of kaupapa Māori methodology and methods made it possible to move this project from aspirations and good intentions to action (i.e. the expression of kaupapa and tikanga) on the ground. The significance of each of these enabling contributions to transformative action are further explored below.

8.4.2.2 Methodology and method: a hapū mediated inquiry process

A hapū-mediated planning process was used to determine the kaupapa Māori research methodology used in this project.[1445] Numerous methods (including those based on mātauranga Māori and western science) were utilised in the restoration activities[1446] and doctoral research endeavour[1447]. The use of both qualitative and quantitative method provided the whānau and hapū of Waiorongomai with a substantial range of knowledge that could be used to inform this socially-mediated process in a way that provided an evidential basis for planning and decision-making.[1448]

Some aspects of the project involved a blended mix of tikanga and western scientific method that could be considered as the growth of hapū tikanga into new domains. To illustrate this point, the Te Rito wānanga that was held on 07 November 2014 started

[1445] Chapter 4 (Sub section 4.1.3).
[1446] Chapter 6 (Section 6.2).
[1447] Chapter 6 (Section 6.3).
[1448] Chapters 5-7.

with karakia. This was followed by kōrero[1449] from kaitiaki and science teacher Rolly Raureti about the cultural significance of this sacred site to local hapū. This was followed by an invasive species trapping demonstration by Landross Lewis (i.e. the expansion of kaitiakitanga into a new tikanga domain). This in turn was followed by kōrero from Kuia Queenie Rikihana on early childhood memories that included whānau fishing trips to the lake and foreshore. All those present then planted the translocated harakeke. Karakia was conducted before eating lunch. Finally, these contributions were followed by kōrero from myself about my doctoral studies; collection and viewing of macroinvertebrates and a fish monitoring exercise in which the students collected results for inclusion in this doctoral research.[1450]

8.4.2.3 Decolonisation as a contribution to kaupapa Māori methodology

This doctoral research and thesis contributes to the retention of our whānau, hapū and iwi cultural identity and survival.[1451] Although activism was not pursued as an outcome for this doctoral research, the thesis does contribute to aspects of decolonisation as the research process did not follow a typical western science approach.[1452] Likewise, this doctoral thesis does not follow the typical western academic writing structure.[1453] Instead, both this research project and doctoral thesis have been intentional attempts to: (i) reclaim our distinctive Ngāti Raukawa ki te Tonga Māori cultural identity; (ii) reframe this distinctive cultural identity in a modern-day western academic context as a basis for; and (iii) re-instating the mana of a whānau Māori ecosystem. As such, this project and doctoral research make an important contribution to the decolonisation of western science.

[1449] Speak, narrative.
[1450] Chapter 5 (Sub section 5.3.5).
[1451] For example, oral narratives and narratives used within Chapter 5 (Section 5.2).
[1452] For example, literature review, research question or hypothesis, data collection, analysis of results, write up in thesis.
[1453] For example, chapters 5 to 7 had methods and results blended together within each chapter.

8.4.2.4 Knowledge development an indirect result of hapū preferenced outcomes

This doctoral research endeavour towards a theoretical and practical (i.e. transformative outcomes-base) reflection on kaupapa Māori research approaches when compared and contrasted with more commonly used action research method.[1454] What this comparative evaluation shows is that while many similarities exist[1455], there are notable differences between these two socially-mediated approaches to problem solving.[1456] As such, this doctoral thesis provides a mana-enhancing (i.e. positive) contribution towards the action research literature by providing a (Ngā Hapū o Ōtaki) Māori cultural perspective on action research. This perspective assists in explaining why kaupapa Māori research as a methodology was the most culturally appropriate approach to use in this case study.

The distinctively Māori approach to the methodology and methods used within the restoration project and doctoral research influenced this thesis and in doing so, the PhD output provides a unique contribution to current literature and the whānau and hapū of Lake Waiorongomai as the main audience. It is also written to meet the requirements of a doctoral scholarship and accommodate a wider audience.[1457] My meeting of academic requirements was also important to whānau, as they supported my doctoral research endeavour.

> The way I look at rangatiratanga is getting a win-win for the beneficiaries of the lake and you to get your PhD. We see that as a key to our rangatiratanga of giving up our taonga for you to study. Which you are connected to, we are all connected to it…

[1454] Chapter 6 (Section 6.5).
[1455] Table 6.5.1.
[1456] Chapter 4 (Section 4.4) and Chapter 6 (Sub section 6.5.2).
[1457] Chapter 4 (Sub section 4.1.5).

> For us it has been a win win for everyone. We got research and the restoration project kicked off which enhances our rangatiratanga.[1458]

> We would like her PhD to be an enjoyable experience. Our role needs to be to give our support actively by surrounding her with a korowai of aroha.[1459]

8.4.2.5 Kaupapa Māori method as an enabler of transformative change

The use of a kaupapa Māori methodology during this restoration project led to expressions of kaupapa and tikanga as a means for enhancing transformative change, cultural survival and knowledge development. This case study also created opportunities for local whānau and hapū to develop/grow tikanga, by reclaiming, reframing and re-instating cultural customs and practices during restoration activities.

Growth in methodology, method and best practice of this kind represents an important contribution to the academic literature (e.g. kaupapa Māori methods, action research tools, adaptive strategies and creative artistic activities as enablers of transformative change, cultural survival and knowledge development).[1460]

8.4.2.6 The appropriate treatment of tapu and wairua in this project

A kaupapa Māori research approach has the ability to deal with the complexities of our culture, worldview and consequent interconnected layers or levels associated with whānau, hapū, iwi, community and ecosystems' realities.[1461] In particular, a kaupapa Māori research approach that is mediated by a Māori community easily

[1458] Interview with Rupene Waaka, 29 November 2017, at Lupin Road, Ōtaki, Interviewer Aroha Spinks.
[1459] Figure 4.1.1. Note: Korowai of aroha means a cloak of love and compassion.
[1460] Chapter 6.
[1461] Chapter 6 (Sub section 6.5.3).

incorporates the essential spiritual dimensions of Māori reality[1462], whereby the use of karakia, observing tohu, respecting wāhi tapu and conducting tikanga are the norm.

8.4.3 The role of isolation as an enabler of transformative change

The various contributions to kaupapa Māori research methodology and method made by this lake restoration project and doctoral thesis are inextricably linked to the central role that whānau, kaitiaki and hapū in co-creation activities. While this point has now been clearly stated, reflection on this doctoral research journey reveals the existence of one further, essential ingredient that has been reclaimed from the atua experiences of our tūpuna.

In this case study, the near intellectual isolation from the western academy literature at the early research stage was an enabler of transformative change and cultural survival outcomes. My tūpuna developed an epistemology while being: (i) isolated on small islands that were natural ecosystems similar to laboratories; (ii) isolated from the intellectual evolution of western scientific thought in the Northern hemisphere while; (iii) building on their own Māori worldview and oral traditions of knowledge development. Aspects of this doctoral research endeavour have been reclaimed from the experience of my tūpuna. First, at the beginning of this restoration project and my doctoral research endeavour I relied on and received substantial guidance from rangatira[1463], kaumātua, the kaitiaki team, mentors, supervisors and whānau. In particular, it was culturally appropriate as a Māori researcher to be guided by my elders. Second, this relative isolation from western academic methodology and method literature meant that this project and my doctoral research were both grown 'on-the-ground' in a whānau Māori ecosystem context. The focus of attention provided in this

[1462] Chapter 5 (Sub sections 5.2.2, 5.3.2 and 5.4.2).
[1463] Leaders.

thesis on literature reviews, methodology and methods involved retrospective (cf. a posteriori) attempts to reflect on and theoretically/methodologically position what had already been done.[1464] Therefore, this written, western academic (methodological) orientation was not necessary for the effective expression of kawa, kaupapa and tikanga in this project.

Similar to our Māori ancestors I enjoyed the privilege of intellectual isolation through this doctoral research endeavour. This isolation is an important for the creativity needed to enable transformative change in a Māori cultural knowledge development, survival and wellbeing context. If I had concentrated on reading the literature earlier in my doctoral journey, I would likely have taken a very different approach to this restoration project, research and doctoral thesis. Western science approaches and environmental planning models[1465] generally struggle to cope with complexity, uncertainty, chaos and (apparently) random nature of a Maori cultural problem context. Kaupapa Māori method can adapt to a problem context of this kind. Kaumātua Rupene Waaka said: "I would describe it as dynamic. That is wairua in my opinion. Wairua grabs us to push us this way or that way, we react. Wairua is the driving force."[1466] This Māori approach to research also makes a contribution towards causality. Thus, as noted in this section, while whānau-hapū-mediation and intellectual isolation maybe necessary enablers of transformative change in a whānau Māori ecosystem, the role of tapu and wairua must also be appropriately considered in our treatment of kaupapa Maori methodology and method.

[1464] Iwi member Ani Mikaere has commented, that conducting literature reviews at the beginning of research activities can be potentially limiting as it can predetermine the boundaries and narrow research potential. Mikaere, 2011, p. 37.
[1465] Ludblom, C., 1974, Incrementalism and environmentalism, pp. 32-34. Cited in Mitchell, B., 1977, Resource and environmental management, p. 87; Mitchell, 1977, pp. 85-87; Rittel, H., & Webber, M., 1973, Dilemmas in a general theory of planning, p. 155.
[1466] R. Waaka, personal communication, 8 November 2017.

8.5 Contribution to theory

This section draws attention to contributions that the Lake Waiorongomai restoration project and doctoral research endeavour has made to theoretical knowledge development. As Māori we use written and oral 'explanation' and make 'predictions' on a daily basis. However our articulation of theory may differ from western science theory. Given that one of the goals of doctoral research is to make contributions to the current state of theory, I offer an explanation as to how I see the contributions of this doctoral research endeavour in that respect.

This case study might be considered a small contribution towards kaupapa Māori research methodology and Māori knowledge development. As outlined in this discussion section, Māori knowledge has at least three forms (i.e. mātauranga, mōhiotanga and māramatanga) that might be considered as different types of knowing. Furthermore, these types of knowing can be considered as appropriate for use in making reference to the three realms of a Māori worldview: (i) Tua-uri (i.e. the realm of mauri); (ii) Te Aro-nui (i.e. the realm perceived by human senses); and (iii) Te Ao Tua-ātea (i.e. the realm of Io Matua Kore that is beyond the time space continuum).[1467] When discussing 'theoretical' contributions made by this doctoral thesis it would be appropriate to include all culturally defined (i.e. mātauranga, mōhiotanga and māramatanga) contributions to knowing (8.4). I have attempted to show the significance of these collective contributions to Māori knowledge development by explaining how important they are as 'contributions' to local Māori cultural survival.

Finally, while this section attempts to outline the significance of the theoretical contributions made by this doctoral research project, these contributions have come as a

[1467] Marsden, 2000, pp. 60-62.

result of the use of what might be referred to as a mixed methodology. Some of the contributions to theory follow from the careful application of well-defined, ecological, experimental method. Other contributions follow from the use of reflective practice and comparative analysis (e.g. insights on the limitations of action research in a Māori cultural context). Other theoretical contributions have come from efforts made to better understand the role of what academic scholars might refer to as 'methodology' and 'method' in this research endeavour. The appeal for Māori scholars to understand just how western scientific methodology, epistemology and methods are employed in Māori knowledge development follows from a desire to appropriately address real-world problems in a way that also achieves the goals of enhancing Māori cultural wellbeing and survival. There is no collectively defined 'prescription' for doing this at present. Thus, this thesis could be viewed as another small, but confident contribution towards these important goals of Māori knowledge development.

8.5.1 Characteristics and general character of this doctoral research endeavour

This doctoral research endeavour and thesis crossed cultural boundaries[1468], knowledge systems[1469], disciplines[1470] and institutional contexts[1471]. The case study highlighted the existence of a theoretical alternative to action research and contributes new perspectives to 'wicked problem' best practice. Every effort has been made to ensure that these contributions are culturally sensitive and holistic, and based on Māori community values. The Lake Waiorongomai restoration project provides a small window into the domain of Te Ao Māori and as such provides a written account of a kaupapa and tikanga re-enhancement activity that was led by Māori. Wider non-Māori

[1468] Māori and Pākehā.
[1469] Mātauranga Māori and western science.
[1470] Resource and environmental planning, applied ecology and Māori studies.
[1471] Massey University, Victoria University, Te Wānanga-o-Raukawa, Whakatupuranga Rua Mano, Te Rito, He Iti Nā Mōtai.

community support during this project has enriched these outcomes. Collectively, these characteristics define a doctoral research endeavour and thesis that provide: (i) a culturally-mediated contribution to ecosystem restoration theory; and (ii) a real-world example of transformative change that contributed to Māori cultural survival, collective knowledge development and the wellbeing of a threatened ecosystem.

8.5.2 Specific contributions to theory made in this doctoral thesis

This doctoral thesis makes a local case study contribution to theory in the general disciplinary areas of kaupapa Māori research (i.e. Māori studies), applied ecology as well as resource and environmental planning (i.e. action research). In addition, this is the first known publication dedicated solely to Lake Waiorongomai, a sacred site and taonga near Ōtaki. As such, it contributes to documenting the ecological and cultural history of this lake ecosystem through oral narratives, whakapapa, history, scientific, regulatory (i.e. local government) and literary sources. In addition, this thesis has recorded significant recent historical events that initiated the Lake Waiorongomai restoration project.

The primary aim of this doctoral thesis was to provide a comprehensive narrative of restoration, operational, research and creative artistic activities over the past seven years. For this reason, this doctoral thesis has had to grapple with the problems of: (i) defining methodology and method in a Māori community research project based on the use of a mixed modality; and (ii) theoretically positioning and explaining the rationales behind the use of this somewhat unconventional approach. It attempts to define and explain why and how kaupapa Māori research is applied.

Reflective inquiry was used to help better understand how the Waiorongomai whānau and hapū actively worked towards their aspirations and my role in contributing towards

these outcomes as a kaupapa Māori researcher. This doctoral thesis also provided opportunity to reflect on the holistic Māori approaches (methods) used to achieve active on-the-ground restoration, transformative change, cultural survival and knowledge development outcomes.

The aim of this doctoral thesis also allowed for the opportunity to reflect on efforts made to create a distinctly Māori approach to restoration.

8.5.2.1 Contributions to action research and environmental planning theory and best-practice

In this doctoral research endeavour, the use of kaupapa Māori research methodology to achieve hapū aspirations resulted in theoretical insights that may well be of value to action research theorists and practitioners. The results and outcomes of this project show that kaupapa Māori research and action research methodologies can align, especially in environmental restoration projects. However, there are also culturally defined differences between these two problem solving methods. The major theoretical difference is that kaupapa Māori approaches are socially mediated in a way that results in pathway behaviours that are hapū specific rather than sequentially aligned to the predictions of the generalised action research model. Kaupapa Māori approaches also involved layers of pathway complexity that can be explained by contextual expressions of kaupapa and tikanga that are not explained or predicted by existing action research models. The expression of kaupapa and tikanga could be explained as non-deterministic enabler of transformative social-ecological change. Finally, action research does not easily accommodate cultural variability and preferences that may need to be prioritised and carefully followed in situations where a given cultural entity is at risk of extinction. These insights are of tremendous importance to action research and

environmental planning practitioners in New Zealand (specifically) and the rest of the world (generally).

8.5.2.2 Contributions to kaupapa Māori research theory

Kaupapa and tikanga played a central role in the survival of our tūpuna. One significant goal of our tūpuna that has been gifted to our generation is the responsibility to care for and sustain the wellbeing of Te whānau ā Ranginui rāua ko Papatūānuku.[1472] In problem contexts where it was evident that our kaupapa and tikanga didn't achieve this wellbeing goal, we adapted it or excluded it. As part of their existence and isolation on these islands and over a very long period of time our tūpuna lived by a set of cultural values that were systemic in their influence and able to effectively sustain the wellbeing and survival of a whānau Māori ecosystem. As Māori, we consider that these values provide a reliable, time tested approach to human and ecological wellbeing. Thus, to a certain extent these values and their expression as tikanga are an intergenerational legacy. However, Māori culture is not locked in a time capsule. This point is important because this problem has been instrumental in adapting and expanding local tikanga (Table 5.5.1).[1473] There is a very real sense in which new tikanga have emerged from this project, which reflects a growth in the (theoretical) understanding of my Māori community. We have provided a rationale and evidential basis for changes in tikanga (i.e. right ways of doing things). This evidentially-based shift in thinking is a valid contribution to theory and what might be defined as the current state of knowledge of my own Māori community in Ōtaki.

[1472] Literally: The extended family of the sky (Ranginui) and earth (Papatūānuku). I.e., all beings and entities.
[1473] Chapter 5 (Sub section 5.5.1).

8.5.2.3 Emerging lessons from a Māori case study for solving wicked problems

In reflection, this case study can be compared and contrasted with the emergence of current Western academic thinking that relates to finding solutions to wicked problems. There is some alignment between the Lake Waiorongomai restoration project and the key characteristics of wicked problems and their potential solutions. A recent conference on environmental policy and design noted that planning researchers and practitioners are now heavily influenced by learning from experience and across disciplinary boundaries.[1474] That is, recommended as the skills needed to facilitate 'bottom up', locally oriented, place-centric, collaborative solutions.[1475] The term 'wicked problems' was applied to planning by Horst Rittel and Melvyn Webber in 1973.[1476] At that time their concept challenged scientific thinking that dealt with 'tame problems', by proposing 'optimal solutions' and 'definitive answers' which in their opinion was inadequate in complex pluralistic societies.[1477] The concept of wicked problems rejected rationalistic planning designs (Appendix 25). Instead it acknowledges subjectivities, and encourages argumentative-based solution processes[1478] to wicked problems, which are a consequence of a modern economic paradigm that stresses the importance of production and consumption activities to economic, social, ecological and cultural wellbeing. Environmental problems are increasingly recognised as wicked problems, and environmental publications are increasingly acknowledging community values as an essential means of addressing the same.[1479] Modern policy science tries to embrace and consider a broad range of argumentative, deliberative,

[1474] Crowley, K., & Head, B., 2017, The enduring challenge of 'wicked problems': revisiting Rittel and Webber, p. 545.
[1475] Ibid.
[1476] Rittel & Webber, 1973.
[1477] Ibid, p. 155.
[1478] Crowley, & Head, 2017, pp. 539-540; Innes, J., & Booher, D., 2016, Collaborative rationality as a strategy for working with wicked problems, p. 8; Zellner, M., & Campbell, S., 2015, Planning for deep-rooted problems: What can we learn from aligning complex systems and wicked problems, p. 457.
[1479] Crowley, & Head, 2017, pp. 539-547.

collaborative and network-based approaches to problem solving.[1480] The existence of wicked problems is very much based on a western scientific (academic) perception of reality.

The conceptualisation of a wicked problem has also potentially created a situation where communities do nothing because wicked problems are too complex and unpredictable. The current focus of national, regional and local government policies and planning is concentrated on attempts to understand theories, data collection, researching problems predicting scenarios and potential solutions. Community engagement aims to capture another important dimension of wick problems (i.e. the expression of community values as part of production and consumption activities.

This thesis makes a number of theoretical contributions towards the goal of solving wicked problems. First, a key point needed to help understand the validity of this comment is that modern economic theory and profit-making is not generally the main priority for whānau and hapū. The best way to avoid wicked problems is to prevent them. Positioning Māori business activities on Māori cultural values and tikanga aligns these activities with cultural priorities to protect the wellbeing and survival of humans and the natural world. When wicked problems are unavoidable, this project shows that the expression of kaupapa and tikanga can also be used to mitigate and resolve wicked problems. Furthermore, this thesis provides concrete evidence that wicked problems are not yet beyond the positive influence of kaupapa Māori research practice.

8.5.2.4 Theoretical contributions from a Māori values based approach

In 1997, Robert Costanza and Carl Folke introduced an integrated ecological economic and valuation framework to help other researchers and communities better

[1480] Ibid, p. 545.

understand the relationships between ecosystem wellbeing, goal orientation and the expression of human values.[1481] They proposed that the expression of human values supported human aspirations or goals for ecological sustainability, social fairness and economic efficiency.[1482] Policy practice, in their opinion, needed to be based on a multiple ecological-social-economic goal approach if the consequences of modern-day planning and economic activities were to be avoided by future generations.[1483] This multiple goal approach to problem analysis and solving is complicated and complex. As a consequence, even though planning and policy making activities are based on the current state of scientific knowledge, they tended to just concentrate on achieving the goal of economic efficiency. While economic efficiency is a valid planning and policy goal, it can exacerbate wicked problems because, from a systems perspective, it is an incomplete solution to the goals of efficiency, fairness and sustainability. This case study shows that a multiple-goal approach to problem solving based on efficiency, fairness and sustainability is not irrelevant to Māori communities, but it is incomplete. This is because the goals outlined by Costanza and Folke do not specifically include the goal of cultural survival.[1484]

In an attempt to include a Māori perspective based on our cultural values, I have adapted their table with the addition of kaupapa as a value basis (Table 8.5.1) with cultural survival as a corresponding goal.

[1481] Costanza, R., & Folke, C., 1997, Valuing ecosystem services with efficiency, fairness and sustainability as goals, pp. 45-68.
[1482] Ibid, pp. 56 & 65.
[1483] Ibid, p. 51.
[1484] Ibid, p. 57.

Table 8.5.1 Valuation of ecosystem services based on the four primary goals of efficiency, fairness, sustainability and kaupapa (Māori cultural values)

Value Basis	Who votes	Preference Basis	Level of discussion required	Level of scientific input required	Specific methods	Goals
Efficiency	Individuals act rationally in self interest	Individual	Low	Low	Willingness to pay	Economic efficiency
Fairness	Individuals act in the interest of community	Community	High	Medium	Veil of ignorance	Inter and Intra fairness
Sustainability	Individuals act in the interest of natural environment	Whole system	Medium	High	Ecological economic modelling	Ecological sustainability
Kaupapa	Whānau and individuals act in the best interest of hapū and iwi	Whānau Māori ecosystem	High	Low	Kaupapa Māori research	Cultural survival

(*Source: adapted from Costanza, R., & Folke, C., 1997, p. 57*)

With (Māori) cultural survival included as a specific goal, the approach becomes more relevant to Māori communities. While much research has gone into expanding the range of methods used to plan and create policies that are more responsive to efficiency, fairness and sustainability goals, there is now a real need for planners and policy-makers to expand their theory, methodologies, methods, goals and values in ways that also support cultural survival outcomes and aspirations. This doctoral research endeavour indicates that transformative, multiple goal and value outcomes of this kind are possible, given the appropriate use of culturally mediated values, methods and methodologies.

8.5.2.5 Ecological monitoring to support whānau Māori ecosystem wellbeing

In this case study, baseline ecosystem monitoring was conducted in a holistic, culturally-appropriate way designed to provide understanding that supported the goal of whānau Māori ecosystem wellbeing and survival. This doctoral thesis did not follow

the pattern of traditional ecological research that focussed on theory, method, results, analysis of results, discussion and conclusions. While the baseline ecological research data was collected using proven ecological methods, every effort has been made to ensure that these activities were appropriately expressed in ways that included and complemented kaupapa and tikanga. For example, monitoring activities were community-based and provided opportunities for whānau members, students, this researcher, external experts and community members to be involved. Local tikanga set by the whānau and hapū was upheld by those conducting monitoring activities (6.3.8). The ecological monitoring part of this thesis has also been written in a way that is consistent with emerging thinking in Māori scholarship that preferences whānau and hapū as primary audiences.[1485] These theoretical and methodological contributions also provide an example of best practice that can contribute to assisting future national, regional and local government level policies, planning and community engagement/research activities.

8.6 Conclusion to this doctoral thesis

This doctoral thesis aimed to document the findings of a six year research activity based on reflective inquiry into a hapū-led dune lake and wetland restoration activity that involved: (i) the coordination of knowledge development across kaupapa Māori and western scientific worldviews; and (ii) the collective emergence of a hapū-mediated restoration approach that is compared and contrasted with action research theory and practice. Conclusions drawn from progress made towards the achievement of this research aim are outlined below.

[1485] Smith, G., 2000, pp. 212-215; Smith, L., 2000, pp. 225-247; Stokes, 1985, p. 10.

8.6.1 Reflections of a hapū-led process in accordance with kaupapa and tikanga

This thesis attempted to provide a comprehensive, reflective narrative of the Lake Waiorongomai restoration project and accompanying doctoral research endeavour that was hapū-led[1486] in accordance with local tikanga and kaupapa[1487] as evidenced in narratives and photographs collected for this study.[1488] The strong whānau and hapū commitment and effort that were key to the success of this venture so far, is intended to continue into future generations. This hapū-led project with hapū-selected kaupapa and local tikanga, was respected by all community members involved. However, it is also evident that Māori-cultural-mediation of transformative change was also brought about by positive engagement with external organisations that helped to support the Lake Waiorongomai restoration project. Community support for this project included significant funding and mentoring by external organisations such as the local and regional councils that aided the success of this project. For this reason, the positive social and cultural benefits of this project were shared by whānau, hapū, iwi and the wider community. Finally, synthetic outcomes of this kind required additional facilitation and mediation of a different kind. It has been shown in this thesis that having sufficient funding to support hapū restoration initiatives (including paid iwi researchers) was a critically important, contributing factor to the success of this case study.[1489]

8.6.2 A hapū-led dune lake and wetland restoration project

As the first publication dedicated to Lake Waiorongomai, this doctoral thesis outlines historical contexts and worldview perspectives of local whānau, hapū and iwi

[1486] Ngā Hapū o Ōtaki.
[1487] Key kaupapa - rangatiratanga, wairuatanga, kaitiakitanga, ūkaipōtanga, pūkengatanga, kotahitanga.
[1488] Chapters 5-8.
[1489] Chapter 1.

associated with this ancestral landscape as well as recent restoration activities.[1490] By providing a narrative and explanatory scope of this kind, this thesis offers a window into the world of a Māori community engaged in a transformative restoration project of a sacred dune lake and surrounding wetlands. This narrative has provided opportunities to show how participating whānau and hapū expressed local kaupapa, tikanga and te reo Māori as their contribution towards enhancing whānau Māori ecosystem wellbeing, cultural survival and knowledge development.[1491] Māori and western scientific methods were employed and used simultaneously.[1492] Because this project is based on a kaupapa Māori approach that combined with western science approaches to support planning and human ecosystem restoration, it provides an important model of emerging best practice for other iwi.[1493] Given a scholarly and operational scope of this extent, this case study has the potential to: (i) inspire other iwi and Māori researchers in their expression of kaitiakitanga; and (ii) encourage policy makers and planners to see the advantages of supporting hapū-led restoration projects of this kind. In addition to practical and operational outcomes of this kind, the kaupapa Māori research approach used in this endeavour also proposes potential theoretical contributions to environmental planning fields and western ecological science.

8.6.3 The coordination of knowledge development across kaupapa Māori and western science worldviews

This hapū-led restoration project shows how cultural values can be used to guide movement and facilitate knowledge growth across cultural boundaries[1494], knowledge

[1490] Historical context in chapters 2-3. Recent restoration activities in chapters 5-7.
[1491] Chapter 8 (Sub-sections 8.1-8.3).
[1492] Chapters 5-7.
[1493] Chapter 6.
[1494] Māori and Pākehā.

systems[1495], institutional contexts[1496] and disciplines[1497]. This doctoral endeavour attempts to enhance the field of resource and environmental planning by documenting the use of a cultural approach (i.e. kaupapa Māori research). Current planning literature is based on an implicit assumption, that planning in a community context necessarily involves western planning theory and method, which can be problematic or limiting (e.g. selected indigenous contexts and wicked problems). Therefore, this case study has made a potential contribution by showing that transformative change is possible when an appropriate cultural planning approach is used. The results outlined in this thesis show that if a project of this kind can be designed in a way that the research methodology and methods used also match the participating or lead community cultural context, then such a project is more likely to succeed. Furthermore, this thesis shows how Māori community leadership can facilitate wider community involvement. This research endeavour demonstrates how community-based monitoring in a Māori cultural context can be achieved when whānau, hapū scientists, local Māori learning institutes and community members collaborate in the collection of ecological data. The resource and environmental planning and restoration activities in this case study were conducted in a Māori way with western science in a supporting role. As such, this thesis documents and describes how whānau and hapū are able to give effect to restoration aspirations in their ancestral landscape. This kaupapa Māori approach is valid, unique and thus provides a contribution to planning literature.

[1495] Mātauranga Māori and western science.
[1496] For example: Ngā Hapū o Ōtaki; Taiao Raukawa Environmental Resource Unit; Greater Wellington Regional Council; Kāpiti Coast District Council; Massey University; Victoria University; and Te Wānanga o Raukawa.
[1497] Resource and environmental planning, applied ecology and Māori studies.

8.6.4 The collective emergence of a hapū-mediated restoration approach that is in this compared and contrasted with action research theory and practice

This thesis provides a cultural reflection on action research methodology. This reflection was made possible by undertaking a comparison and contrast of action research and kaupapa Māori research method in relation to the Lake Waiorongomai restoration project.[1498] Analysis showed both similarities and distinct differences between the kaupapa Māori methods used in this project and an action research approach. For example, significant complexities and cultural practices exist within a hapū-led restoration project of this kind that are not found in the generalised action research cycle.[1499] Furthermore, this case study provides insights into a cultural approach that deviates from logical steps associated with existing action research models.[1500] The kaupapa Māori approach incorporated cultural values (kaupapa) and practices (tikanga) while coping with complexity, uncertainty and adaptive strategies which are well-known to exist in environmental planning contexts. The current state of theory and practice in action research is potentially incomplete as a basis for the successful use in indigenous cultural contexts. Also highlighted in this case study is the flexibility, complexity and capability required in my supportive role as a kaupapa Māori researcher.

Given the above, this doctoral thesis concludes that a kaupapa Māori research approach was necessary to support the restoration aspirations, kaupapa and tikanga of local whānau and hapū. This hapū-led and research-supported approach enhanced the mauri and wellbeing of a whānau Māori ecosystem surrounding Lake Waiorongomai. It also

[1498] Chapters 4 and 6.
[1499] Chapter 6 (Section 6.5).
[1500] For example at times driven by wairua and tikanga. Further details in Chapter 6 (Section 6.5) and Chapter 8 (Section 8.4.3).

contributed towards the descriptive, narrative, theoretical and synthetic knowledge development documented in this doctoral thesis.

Appendix 1 Kaumātua oral interviews about Lake Waiorongomai prior to the restoration project

Name: Uma Kaihau Carkeek
Quote: "I started going to Waiorongomai when I was going to primary school. I went with Dad and the brothers. Usually for eeling but sometimes we used to haul the lake for mullet. It was much the same as today as it had already been drained. When I first started going out there Whata Davis was setting hinake out there (your father of course), Uncle Paddy, Uncle Roy Roiri, John Bishop, John Moeau, Bubby Brown. But I was lucky enough when I was young to see the last of the big runs going down that creek. 'You could actually walk on the buggers it was that thick'. That time dad had the first possie we will pull our net out, next was Whata Davis, and they would let them go to the next and the next and in the morning we would all go out on the beach and pick them up off the sand. We always brought the eels home – dad had eel boxes (in the creek) to keep his eels in – out Tasman road and also round here behind Raukawa (marae)."
Name: Ariana Aomarere
Quote: "Memories of you going out to Waiorongomai on the horses… and the eels… big fat eels juicy ones brought back and split and cooked… and having a whole eel if you wanted to… all the fat all the hinu running down your face with a greasy chin diving in again and having another one… until your mother said 'Ariana!'… mum cooked them in the summer she would make a fire with wire netting over it… and tonu tinu it and she would slash its sides so it got all crunched up."
Name: Laurie Carkeek
Quote: "Very important being out there with dad – Tahiwi Carkeek – heard lots of stories about all sorts of incidents… the run when the eels broke out and rushed across the sand… migration. It was always exciting to go there. In more recent times with Uma and we have collected kai for Raukawa and tangi. The direction we are taking here is extremely interesting and powerful… looking at our assets and taonga. A lot of work going into this…"
Name: Erna Winterburn
Quote: "I remember riding out to Waiorongomai with my Hema Whata our grandfather taking the horses – he could not drive. We would ride down the beach… I remember opening only one gate – I'm sure he took us to open that gate (laughter)." "I'm 64 now and I would have been 10. Me and (Aunt) Erna (Gestro's) kids, Charlie and my brother Mop (Hema). The stream had a lot more water than there is now. Seemed to have a much better flow than it has now." "Our people of Otaki have always had free access to the lake. We have a leave but Tapawai and Neal Uren had the lease and when they had finished Hans and I applied and the Maori Trustees gave it. Must be 30 years since then I have become the majority land owner because whānau have asked."
Name: Hohepa Te Hana Wehipeihana
Quote: "I'm aged 70. I used to go out there quite a lot. I remember going out with my grandfather Hema Hakaraia. He had a couple of horses out there – quite a few. We lived at Rangiuru and used to ride from there all along the beach. Uncle Lawton my dad's brother had a bach out there. And we used to go out as kids. We were accused of burning down a couple of mai mai but it wasn't us. One memory I do have is when we (the whānau) had caught all these eels (before) going out sea. Time being there when the eels were running and they were in this huge pool (thousands) at the bottom of the creek. You could have walked across them

there were so many of them… they were waiting there for the tide I think."
Name: Ngati Wehi Wehi Nicholls
Quote: "Lake Waiorongomai – well I was born and breed here (Ōtaki) so I played out there. We done everything when we were kids – no shooting… eeling as kids, Kahu, Peterboy… We would get the eels out of the sands. I remember me getting 56 eels – just myself. We tied flax through them so we could carry them. But they were very heavy and we tried to drag them through the sea. But we couldn't carry them and hung them on a tree. We told a guy with a tractor and be brought them all home for us later."
Name: Isobel Rakapa Miria Simpson (nee Carkeek) known as Sissy
Quote: "I never went to Waiorongomai a lot when I was a child but we used to go their quite a lot when my brother Wattie Carkeek (the author of *The Kapiti Coast*) was alive. He was incredibly creative and actually made a raft (at the lake) and we would go on the raft out into the lake. It never sank."
Name: Polly Duff
Quote: "When I think of Waiorongomai I think of my brother Digger because he went out constantly in his truck and with all of his children. If it wasn't for him and all the eels he caught – I don't know how we would have survived quite frankly." "(Getting eels) was presumed to be men's work and even when I was a kid (when Digger did not have children) I was way down on the list for going out to Waiorongomai. I would loved to have done it – cause other girls in the community did. They went out with their grandmothers and such. Even when the eels came back it was men's work too. They would pawhara them and hang them on the line. This was in the 50's."
Name: Tony Manning
Quote: "My first memory (of Lake Waiorongomai) was of (being with) my Uncle Digger and my cousins Uma, Miki and Tana we used to go on his truck. Uma and I used to be the 'donger knockers'. I'd carry the sack and Uncle Digger used to throw the eels up onto the back with my cousin Uma. We had a club each and would dong them on the head and put them in the sack." "I think the eels have a mauri and I read Elsdon Best's book about eeling and he said they came down from the heavens. That sort of blew me away. We had a kauta at Rangiuru Road the ahi kaa was happening whether at Katihiku or Raukawa or even Ngāti Toa. There was fortunate at that time there was also a gentleman around then my mother's first cousin – Uncle Tom Wilson he taught us – also Uncle Miki Rikihana taught my father in law Sam Cooper how to do raureka eel. Aunty Kiripuai too told us that the kawa of the tuna heke was that it was not to cut the eels up on the plate but to leave them whole so people could take what they wanted. There's a technique with the raureka you have got to make sure the leaves are not too crispy – they have to be a bit soft."
Name: Gabrielle Rikihana
Quote: "Our Mother Goldie Rikihana was born around 1906. She and her cousin Mihi Pairoroku were great friends. This is a quick version of her childhood memories of Waiorongomai during Summer days. Every now and again Uncle Pairoroku would announce a picnic at Waiorongomai, not often but for a complete change. The boys would organise the cart and horse and off they would go to the delight of all people as they clip clopped through the main street. When they arrived at Waiorongomai there was a raupo shelter for the picnic lunch – well provisioned by Auntie Rakete. Just near the waters edge would be a small stake attached to a harekeke rope. When the time came for the picnic Uncle Pairoroku would pull up the rope and up came a jam jar with the butter cooled to perfection. How's that for a refrigerator."

Appendix 2 Lake Waiorongomai restoration project wānanga agenda 2014

Taiao Raukawa Environmental Resource Unit
Manaaki Taha Moana Research Project
Lake Waiorongomai Restoration Wānanga

KEY WĀNANGA DETAILS			
Dates:	**Saturday 22nd to Sunday 23rd February 2014**		
Location:	**Raukawa Marae ki Otaki Kāpiti Coast**		***Alternative venue is Tainui Marae, Convent Road, Otaki***
Accommodation:	**Raukawa Marae**	**Please advise if you require.**	
Contact:	**Rupene Waaka Te Waari Carkeek**	**0272108860 02102973421**	
DATE	**TIME**	**KAITAUTOKO**	**KAUPAPA**
22/2/2014 Rāhoroi/Saturday	**9.30am**	**Te Waari**	**Whakatau Karakia**
Rāhoroi	**9.45am**	**Ngā Ringawera**	**Kapu tī**
Rāhoroi	**10.30am**	**Rupene Waaka**	**Mihi Outline purpose of the Wānanga Housekeeping**
Rāhoroi	**11.00am**	**Te Waari Carkeek, Caleb Royal**	**Lake Waiorongomai Historical Narrative**
Rāhoroi	**11.30am**	**Rupene Waaka**	**Māori Land Court Minutes Waihurihia, Maiotaki, Moewaka Blocks: Waiorongomai 10 (Lake), 3A, 3B1, 3B2, 3B3, 1A**
Rāhoroi	**12.30pm**	**Ngā Ringawera**	**Kai o te Poupoutanga**

Rāhoroi	**1.30pm**	**Aroha Spinks**	**Restoration Project Update** **PhD Outline (Kaupapa Māori Research, Ecology, Environmental Planning)** **Kaupapa Māori Methodologies**
Rāhoroi	**2.00pm**	**Aroha Spinks**	**Workshop** - **Kaupapa Māori Methodology**
Rāhoroi	**2.30pm**	**Whanau**	**Site Visit - Transport to Lake Waiorongomai**
Rāhoroi	**3.00pm**	**Te Waari Carkeek**	**Mihi Whakatau** **Briefing on excursion options, Health and Safety**
Rāhoroi	**3.15pm**	**Roy Winterburn, Tanira Cooper, Jeremy (Skip) Skipper** **Horima Carkeek** **Caleb Royal** **Pātaka Moore** **Aroha Spinks**	**Lake Waiorongomai site visit options:** - **Kaumatua Marquee / Afternoon Tea in Marquee** - **View Eastern Fence and Wade in the Edge of the Lake** - **Assist in looking for Kākahi** - **Eel Aging Demonstration** - **Sedge Seed Spreading** - **Water & Aquatic sampling**
Rāhoroi	**5.00pm**	**Whanau**	**Transport to Raukawa Marae**
Rāhoroi	**6.00pm**	**Ngā Ringawera**	**Kai Hākari**

DATE	TIME	KAITAUTOKO	KAUPAPA
23/2/2014 Rātapu/Sunday	**8.00am**	**Ngā Ringawera**	**Parakuihi**
Rātapu	**9.00am**	**Whanau**	**Pack down Marae Tupuna**
Rātapu	**9.30am**	**Te Waari Carkeek**	**Mihi Whakatau for Visitors**
Rātapu	**9.45am**	**Ngā Ringawera**	**Kapu ti**
Rātapu	**10.00am**	**Huhana Smith**	**Taiao Raukawa Manaaki Taha Moana Te Hākari Dune Wetland and related projects**
Rātapu	**10.30am**	**Richard Anderson**	**Ngā Whenua Rahui Pest and Weed Control Hydrology and Kawenata Potential**
Rātapu	**10.50am**	**Aroha Spinks**	**Ecological Monitoring Water Quality Aquatic Insects**
Rātapu	**11.10am**	**Ngā Ringawera**	**Kapu tī**
Rātapu	**11.30am**	**Caleb Royal, Pātaka Moore**	**Te Wānanga o Raukawa Hapai Whenua Consultants Eel Monitoring Results**
Rātapu	**11.50am**	**Rolly Raureti, Tanira Cooper**	**Whakatupuranga Rua Mano Kura Kaupapa Māori Fish and Koura Monitoring**
Rātapu	**12.10pm**	**Barbara Simons, Barbara Littlejohns, Sue MacIntosh, Margarette Treacher, Geoff Monk, Lena Berger**	**Forest and Bird Society Bird Monitoring**

Rātapu	**12.30pm**	**Ngā Ringawera**	**Kai o te Poupoutanga**
Rātapu	**1.30pm**	**Rob Cross**	**Kāpiti Coast District Council** **Biodiversity Sector**
Rātapu	**2.00pm**	**Rupene Waaka, Aroha Spinks**	**Lake Waiorongomai Restoration Annual Plan for 2014** - **Funding Application Successes and Future Submissions** - **Budget Expenditures to Date and Forecasts** - **PhD Requirements and Publishing Plans**
Rātapu	**2.30pm**	**Penny Allen, Martin Bryant**	**Victoria University Landscape Architect 4th Year Students** **Kei Uta / Hinterland Project** **2016 Exhibition Potential**
Rātapu	**3.00pm**	**Mike Urlich, Lee Rauhina-August, Mike Grace, Tim Park**	**Greater Wellington Regional Council** **Native Plant Eco-sourcing, Nurseries, Planting Potential** **Lake Waiorongomai Plant Inventory**
Rātapu	**3.45pm**	**Ngā Ringawera**	**Kapu ti**
Rātapu	**4.00pm**	**Aroha Spinks**	**Workshop** - **Planting Plan** - **Future Potential**

Appendix 3 Rae ki te rae wānanga agenda 2013

MANAAKI TAHA MOANA PROJECT

RAE KI TE RAE

WITH WHAKATUPURANGA RUA MANO

TUESDAY – 19/11/2013

11am Start at Whakatupuranga rua mano, English Class, Power point presentations

- 11.00 - Introduction – Tetahi Takao
- 11.10 - Wellington City Gallery – Wai Familton
- 11.30 - Manaaki Taha Moana - Dr Huhana Smith
- 11.45 – Rae ki te rae – Dr Huhana Smith
- 12.00 – Revitalising Lake Waiorongomai PhD support – Aroha Spinks
- 12.15 – Revitalising Lake Waiorongomai kaitiaki perspective - Rupene Waaka

12.30pm Transport to Lake Waiorongomai, Lunch on the hill overlooking the restoration area

- 12.45 - Kaitaiki korero - Rolly Raureti
- 01.00 – Tamariki sketching aspects of the landscape

2.30pm Transport to Whakatupuranga rua mano

THURSDAY – 28/11/2013

9am Transport to Victoria University Landscape Architecture Building

- 10.30 – Korero and look around - Person TBC

11am Transport to Central Park, lunch

12pm Walk to City Gallery

- 12.05 – View Rae ki te rae exhibition – Wai
- 12.30 – Education room artistic expression - WRM students*

2pm Transport to Whakatupuranga rua mano

* NB: Student art works will be placed on display at the Gallery in the Education room.

Appendix 4 Greater Wellington Regional Council Iwi Department Funding Application for Lake Waiorongomai 2013

1. What is the name of the project?

The restoration of Lake Waiorongomai.

2. What is the purpose of the project?

- The restoration of Lake Waiorongomai for the benefit and cultural survival of iwi, hapu and whanau.
- The improvement of a freshwater coastal dune lake and wetland ecosystem that will aid in supporting and protecting local native biodiversity.
- As a case study it involves a collaborative approach by iwi, environmental organisations, local authorities and educational organisations and expands on the current research project Manaaki Taha Moana (MTM). For more information please refer to www.mtm.ac.nz.

3. What is the opportunity that you plan to address with the project?

Coastal wetlands such as that surrounding Lake Waiorongomai have been severely degraded in the past 100 years due largely to vegetation clearing and drainage, to make way for pastoral farming, the direct effects caused by grazing stock as well as urban sprawl. The Manawatu/Wairarapa region is estimated to have lost 97.4% of its wetlands (since 1900), with just 1% of swamp areas still intact. Lake Waiorongomai is a rare coastal sand dune lake located approximately 3 km north of the township of Otaki, where the surrounding area is intensively farmed. The legal description of the land including the lake and Waiorongomai Stream (that links the lake to the sea) is "Waiorongomai No. 10 Block" the Maori Freehold Land of approximately 10.3 hectares has been set apart as a Maori Reservation. The Lake Waiorongomai 10 Trust recently met 24 November 2012 and the trustees endorsed their support for the restoration project to start. Despite its degraded nature it has been identified as a wetland of regional significance listed as Ecological Site K001 in the District Plan Heritage Register and as a high value biodiversity site.

Lake Waiorongomai is a significant cultural site for the collection and seasonal harvest of eel. Although Lake Waiorongomai has a long history as a plentiful place for the harvesting traditional sources of kai (food), it has also been used for other purposes. For example, as the name implies when Te Rauparaha and his warriors returned to this rohe (tribal area) they would wash at the lake to remove the shrouds of war. Therefore this lake is also a spiritually significant area, marking a passage from the night of tapu

(death, dark, sacred) to the light of noa (correct, without tapu). Maori families who whakapapa to and own this land still live locally today and continue to collect kai from the Lake, albeit over passing decades the local fishers have witnessed decreased catches of eel, and a general deterioration in the condition of the lake.

This project directly involves the improvement of freshwater quality in the dune lake, stream and wetland ecosystem that will aid in supporting and protecting local biodiversity of native birds, fish (whitebait, cockabullies, kokopu, eel), crustacea (fresh water crayfish, fresh water shrimp), shellfish (fresh water mussel), insects and native plants. The freshwater emptying into the marine coastal area may also positively impact on shellfish species such as pipi, cockle and toheroa.

The small stream (Waiorongomai Stream) meanders a short distance to the sea and it is currently thick with exotic weed as well as two small culverts hinder the migration of fish species, namely whitebait and eels that were caught in large numbers once upon a time. The eels in this lake were caught and analysed by Caleb Royal (a marine scientist working for Te Wananga o Raukawa) in 2008 and his main findings were that the majority of eels were thin and small, due to the lack of food. He commented on the grazing practices, the reduction of foliage around the lake margin, as well as the lowering of the lake levels all having an impact on the availability of food.

4. What is the solution you are proposing?

The Waiorongomai wetland area is historically significant, and hence is targeted for rehabilitation through a staged management approach including initial study of existing aquatic ecosystem functions, cultural significance and constraints on the system. This would involve hydrological surveys, water quality analysis, and interviews with kaumatua and kaitiaki about cultural factors associated with this wetland. Geographical Information System (GIS) technologies may be used to determine the extent of wetland area and habitat given proposed increases in wetland water level at Lake Waiorongomai wetland.

Importantly funding is required to fence the Waiorongomai10 Block (High Priority) please find two recent quotes attached. Note: both companies request a walk over the land to provide a more secure quote. Work with Tim Park on the potential boundary and riparian area to plant recently showed that perhaps the length of the fence may be greater than once thought. It is envisaged that this project will provide fencing to include the Lake, Stream and surrounding wetland, accompanied with riparian margin planting and a fish pass. At this stage to achieve immediate action it is intended to fence off the Lake Waiorongomai Land Block only. Please find a map attached (Attachment 1). Proposed permanent fence type – Round strainer posts, battens and 8 coastal grade wires. Areas likely to have a transitional fence depending on a lake level increase, is Batten/Warratah and 2 coastal grade wires. Continuing discussions with the farmer who leases the surrounding land is another integral process so that he remains aware of the plans. The farmer is married to a relative who owns some of the surrounding lands and is also a shareholder in the Lake Block. They are both aware of the restoration, native tree planting and fencing plans however a formal arrangement

would be ideal, especially to ensure access to the block from the road is achieved for the future.

We can provide assurance that the plants will be eco sourced, that is very important to the local kaitiaki. The following nurseries will be approached to quote:

- Linton Allen (Ohau - currently supply Nga Whenua Rahui for this region)
- Caleb Royal (Kuku)
- Waitohu Streamcare Group (Otaki – specialise in dune species)
- Forest & Bird (Ohau)
- Talisman Nursery (Otaki)
- Major Meta (Whanganui Prison – cheap so may be used for larger plants PV5 or 6)

The number of plants will depend on funding and price. The potential and likely plant species are split into the area types detailed in the table below. A map is attached showing the potential planting area and costs associated with different areas.

Stream - Watercress seed would be immediately introduced after the parsnip weed has gone. Margin species will be planted along the stream edge. Species detailed below. Medium priority.

Wetland areas - will be planted with species that do not mind their roots getting wet. Detail below. High Priority.

Dune - areas will be planted with shelter lowland forest species that do not mind being in drier conditions. Dune species will be located near the coast. Further detail provided below. Low priority.

Area	**Likely Species**
Wetland	Ngaio, Kahikatea, Manuka, Koromiko, Mingimingi, Rautahi, Makomako, Putaputaweta
Lowland Forest Species	Ti kouka, Kahikatea, Kanuka, Karaka, Puketea, Totara, Matai, Kowhai, Nikau, Taupata, Raurekau, Karamu, Manatu, Kohuhu, Mapou, Ake Ake, Kawa Kawa, Horoweka
Stream Margin	Toetoe, pukio, ti kouka, Manuka, Akiraho, Tarata
Dune	Pingao, Karamu, Toetoe, Puahou,

NB: Harakeke, Raupo, Bullrush and others native species that currently exist have not been included in this table above as they are likely to self-seed quickly.

Whanau planting days have been discussed and was favourably received. We intend to organise a Summer Wananga each year starting late 2013 that informs and demonstrates restoration activities. Planning for winter planting weekends begin in 2013 with the aim to start site preparation and planting in winter 2014.

On-going monitoring of ecological components will provide evidence that the project is succeeding. Initially it is hoped within the three years, water quality will improve with less nitrates, phosphates, faecal bacteria and turbidity levels, as well as higher numbers of insects, invertebrates and small fish. Then later six years plus, it is envisaged more, larger healthier eels and itinerant birds will be present.

Weed removal and control steps: A Department of Conservation (DoC) trained local whanau member (Kuruho Wereta or Rangimarcus Heke) will conduct the weed control measures using manual labour and DoC approved sprays. Both are experienced and know when, where and how to conduct the pest and weed control measures. We will engage this expertise in the second year to develop the on-going control plan and train a hapu representative.

Weed types – Parsnip weed, Arum lily, Hornwort (a small amount recently discovered, approaches remove raupo & add granules directly). Removal and managed control is imperative in the first year of this project and then on-going for the future.

5. What are the economic, social, cultural and any other environmental benefits of the project?

The ecological economic value of the wetland will be calculated and compared to the value of the land as dairy pasture, in line with similar studies undertaken in the Waikato. This will provide evidence for farmers to embrace wetland restoration.

The social experience of participants from numerous backgrounds coming together for a common good including Iwi, scientists, academics, artists, council members, environmental groups, volunteers, schools, contractors etc. The sharing of knowledge and expertise between these groups will enhance environmental awareness.

The revitalisation of mauri at this significant location will provide cultural and spiritual benefits for the local iwi, hapu and whanau. Mana will be enhanced as the local hapu once again can provide the delicacy they were renowned for, delicious eels caught from this Lake.
The educational opportunities for the local Māori School (Whakatupuranga Rua Mano) will provide a younger generation with principles for enhancing the environment. Their local Waka ama team is also looking for a location to practise which could provide exercise and healthier living. Te Wananga O Raukawa tutors (Caleb Royal and Pataka Moore) for the Environment Management Diploma and Degree Courses (Te Heke Kaitiakitanga Putaiao and Te Poutuarongo Kaitiakitanga Putaiao) have expressed an interest in students becoming involved with the on-going monitoring at the Lake providing capacity building for the students in a real-life project as well as evaluation material for accountability purposes. Aroha Spinks of Ngāti Kapu descent is endorsed by the Lake Waiorongomai 10 Trustees to conduct her PhD in Environmental and Resource Planning through Massey University utilising the Lake Restoration Project.

6. How will you ensure the solution/benefits of the project will endure, once funding has ended?

In its currently degraded state hapu members still continue to use this site for activities such as duck shooting, clay shooting and catching eels. After the project other activities will be rekindled, such as whitebaiting, fresh water mussel collecting, swimming, rongoa gathering, utilising natural dyes for traditional weaving etc. The replenishment of key food species will encourage local Maori to return to the site and also pass on the knowledge of processing and curing them.

The plants will be well established after three years and with the assistance of birds etc will become self-sowing. The plants will also continue to soak up the nutrients and improve water quality. The methods and knowledge regarding gathering plants for medicinal, food, building and artistic purposes can be carried out here in the future.

The school kids are also a key to the longevity of this project and it is also hoped that career pathways and opportunities will be inspired by their involvement. This project will identify the local coastal environment problems/causes of degradation and provide an action plan that improves the wetland areas surrounding Lake Waiorongomai. This exercise will enhance the mana of the local hapu involved, as they unite (whakakotahitanga) with an on-going project that will restore their lake, stream and relationships to the sea. Such enhancement positively impacts on the surrounding land and sea (e.g. surface and subsurface water quality enhancement has been noticeable in surrounding farmland measured in Te Hakari stream to the Ohau River for the *Hei Whenua Ora: Te Hakari Dune Wetland Restoration Projec*t (Smith 2008). Encouraging signs and physical changes encourages greater iwi/hapu participation. When iwi/hapu are actively involved capacity in resource and environment planning is raised amongst generations who then carry the activities, learning and experience forward into the future.

7. How will you evaluate your project?

Monitoring – Ecological parameters would be assessed including; water analysis (nitrates, phosphates, bacteria, turbidity, oxygen etc), plant inventories, stock analysis (fish, eels, insects, and potentially birds, freshwater mussels). Video footage and photographs would provide visual evidence of the restoration work and social interaction.

Reporting – The monitoring results and milestone reports will be sent six monthly to:
- the Lake Waiorongomai 10 Trust,
- funding organisations as required,
- Nga Hapu o Otaki,
- Taiao Raukawa Environmental Resource Unit (who regularly report to; Te Runanga O Raukawa, Massey University, and the Ministry of Business, Innovation and Employment).

In conjunction with this project a Doctorate of Philosophy in Environment and Resource Planning thesis will be completed by the Project Manager and presented at the end of the three years. At least two journal articles and two local media articles will be published.

Evaluating – The feedback from the reports would provide on-going evaluation through critiquing, ideas, opportunities, solutions to problems and questions to assist in meeting

the aims and milestones of the project. A final evaluation report would be produced at the end of the project and submitted the Greater Wellington Regional Council.

8. What project governance is planned for the project?

The Lake Waiorongomai 10 Trust will govern the implementation and action at this site. As well as endorse all publications and the use of culturally sensitive information. Nga Hapu O Otaki will be the legal entity to lead and administer the restoration project on behalf of the Lake Waoirongomai 10 Trustees and Beneficiaries.

10. What national, regional and local collaboration is involved?

Manaaki Taha Moana (MTM) is a 6-year environmental restoration research programme funded by the Ministry of Science and Innovation (now Ministry of Business Innovation and Employment) from 2009 to 2015. MTM aims to restore and enhance coastal ecosystems and their services of importance to iwi/hapū, through a better knowledge of these ecosystems and the degradation processes that affect them. The research builds upon previous research undertaken with Ngāti Raukawa ki te Tonga that examined terrestrial ecosystems, with MTM having a case study researching the restoration of coastal ecosystems and their services of importance to iwi and hapū on the Horowhenua coastline (from the Hokio Stream to Waitohu Stream). MTM also has a case study with Tauranga moana iwi looking at coastal ecosystems and their services in Te Awanui Tauranga Harbour.

A number of different groups are collaborating on MTM: Massey University's School of People Environment and Planning (Ecological Economist, Professor Murray Patterson is the MTM Science leader); WakaDigital Ltd, a Tauranga-based Information Technology company; Waka Taiao and Te Manaaki Awanui representing iwi and hapū of Tauranga moana (Caine Taiapa is the Research Leader for the Tauranga case study); Te Reo a Taiao Ngāti Raukawa Environmental Resource Unit (Taiao Raukawa), and Dr Huhana Smith as the Research Leader for the Horowhenua case study; and Nelson-based Cawthron Institute (Jim Sinner Senior Scientist). Victoria University's School of Architecture and Design are also collaborating with the MTM team to design coastal restoration options for hapū in the Horowhenua case study.

The central research question of MTM is: "how can we best enhance and restore the value and resilience of coastal ecosystems and their services, so that this makes a positive contribution to iwi identity, survival and welfare in the case study regions?" The team utilises both western science and mātauranga Māori to assist iwi and hapū to evaluate and define preferred options for enhancing and restoring coastal ecosystems.

Part of the wānanga process is to develop Action Plans. They will be produced for improving coastal ecosystems in the rohe (area). The research team works closely as possible with iwi and hapū in the case study regions to develop tools and approaches to facilitate the uptake of this knowledge and its practical implementation, including amongst other iwi throughout NZ. The hapu of Otaki and Kaitiaki are leading the Restoration of Lake Waiorongomai project supported by Aroha Spinks currently

undertaking a PhD in Resource and Environment Planning at Massey University. The key features of this research are that it is: cross-cultural; interdisciplinary; applied/problem solving; technologically innovative; and integrates the ecological, environmental, cultural and social factors associated with coastal restoration.

The participatory approach of MTM goes some way to facilitating the 'reconnection' of links between local communities and their coastal environments, through engagement in the research process itself, by researchers/scientists with tangata whenua and interested people working alongside each other. Such collective dialogue with actions help restore coastal ecosystems and protect biodiversity. Likewise, engagement of whanau, local kaitiaki the and neighbouring community in decision making around the action plans including selection of native trees to propagate and plant, on-going weed and pest control, and the height of the lake is encouraged through this project.

Thus, the MTM research aims and objectives necessitate including participatory research methods whereby tangata whenua, in particular but also other stakeholder groups, are actively involved in guiding the development of research questions and the means by which those questions are researched. Our research approach has enabled Māori and non-Māori, the public and professionals, academic researchers/scientists, environmentalists and local people with extensive regional knowledge, to spend time sharing stories, their wisdom, hopes and fears in a personally engaged manner.

The kaitiaki of Ngati Kapu proposed the restoration of Lake Waiorongomai project, this gained the support of Nga-Hapu-O-Otaki who will govern and administer the Greater Wellington Regional Council funding.

10. What are the milestones for your project?

Milestones year one

Milestone 1:

Fully fence:
- Lake Waiorongomai
- Waiorongomai Stream.
- Include access points for planting.
- Aim to ensure cattle no longer enter the block.

Target Date 1/12/2013

Milestone 2:

Ecological monitoring health factors:
- Aroha Spinks – Water Quality Samples (DO, Ecoli, Total Nitrates, Total Phosphates), Macro-invertebrates.
- Hapai Consultants – Eels (Lengths, Stomach contents, Otoliths)

- Whakatipuranga Rua Mano – Fish (Natives & Introduced Species)
- Horima Carkeek & Manaia Osborne – Kakahi (potential – initial checks)
- Te Wananga O Raukawa Diploma/Degree in Environmental Management – Koura
- NZ Royal Bird Society - Native Birds (potential – to be confirmed, first hikoi for assessment planned in August)

Target Date 1/11/2013

Milestone 3:

Weed and pest control:
- remove weeds and initiate spray activity.
- set traps, checking, maintenance.

Target Date 1/08/2013

Milestone 4:

Native trees and shrubs:
- purchasing.
- propagating.
- 2 small local nurseries started (Te Wananga O Raukawa, Whakatupuranga Rua Mano).

Target Date 1/10/2013

Milestone 5:

Whanau Wananga:
- kaumatua korero.
- restoration update.
- native tree propagation.
- native tree planting plan for 2014.

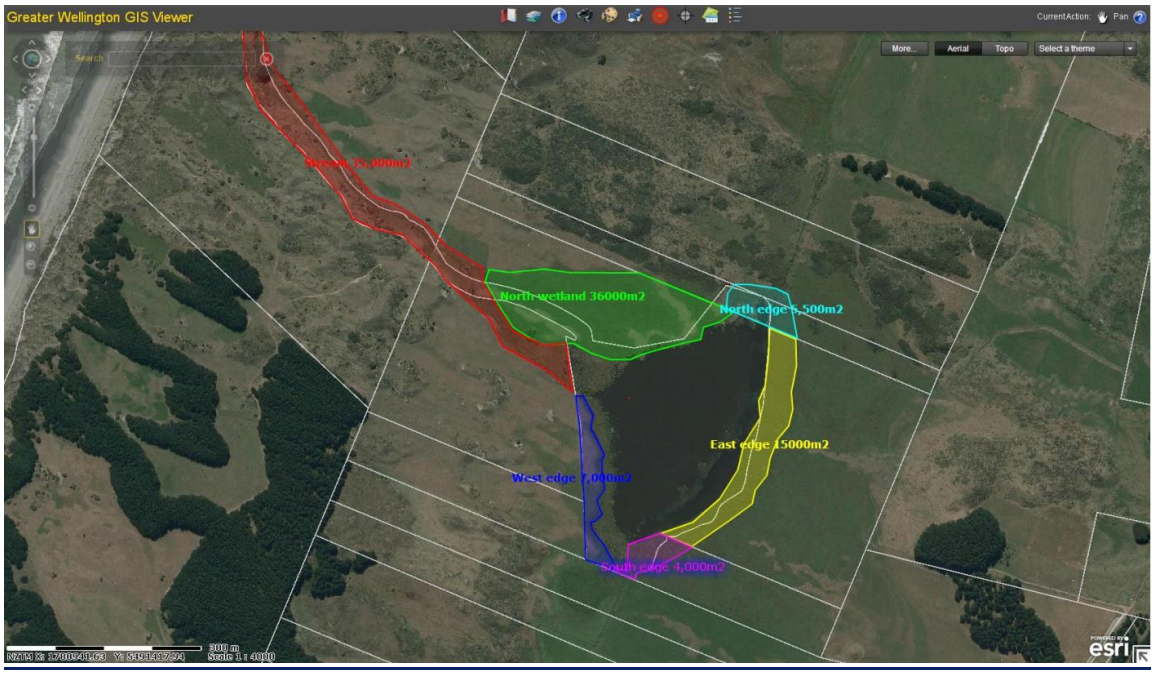
Target Date 1/12/2013

Milestone 6:

Administration and Project Management:
- project management support – Aroha (Taiao Raukawa).
- administration and governance – Nga Hapu O Otaki.
- general support, advice, advertising – Lake Waiorongomai Trust.

Target Date 1/08/2013

ATTACHMENTS (NB: GWRC funding application, next 4 pages)



Topline Fencing (toplinefencing@xtra.co.nz)
Add to contacts
11/02/2013

To: 'aroha spinks'

From:**Topline Fencing** (toplinefencing@xtra.co.nz)
Sent: Monday, 11 February 2013 7:35:24 a.m.
To: 'aroha spinks' (arohaspinks@windowslive.com)

(((Topline fencing quote)))

Kind Regards
Ann Jones
Topline Fencing
www.toplinefencing.co.nz
Email: toplinefencing@xtra.co.nz

15/04/2013

To Whom It May Concern

Below is an initial quote to build a boundary fence surrounding the Waiorongomai (Lake) 10 Block. This is based on viewing the aerial maps on the web references provided: www.maorilandonline.govt.nz/gis/title/19263.htm and whenuaviz.landcareresearch.co.nz/parcel/19263.

Verbal information provided; coastal region, approximately 1500metres and 3 gates. GST exclusive. Note: A walk over the site would be necessary to provide a firm quote.

LABOUR 1500 *$10/m = $15,000.00 (2 persons)

MATERIALS

#	Item Description	Unit Price	Cost
10	Strainer Posts 2.1m	$30.89	$308.90
20	Angle Strainers 2.1m	$23.96	$479.20
20	Half Rounds	$11.50	$230.00
15	Stays	$10.10	$151.50
10	2.5mm HT Wire XL Profence 25kg	$109.00	$1090.00
3	Gate Kiwimaster 3.66m	$177.61	$532.83
1000	Battens	$1.56	$1560.00
5	Post Staples 50 x 4.0 Barbed 5kg	$37.02	$185.10
5	Batten Staples 30 x 3.15 Barbed 20kg	$119.95	$599.75
TOTAL			**$5,137.28**

Total quote - $20,137.28

Kind Regards

Woody Spinks

(Contact details)

Lake Waiorongomai Restoration Project - Implementation Budget
Proposed Funding 2013

NB: * To be confirmed.

Key: GWRC = Greater Wellington Regional Council
KCDC = Kapiti Coast District Council
LWT = Lake Waiorongomai Trust
TW = Te Wananga O Raukawa

M	DETAILS	Budget	GRWC	Ngati Raukawa	Other funders	Total
1	Fencing, gates, styles, troughs, stream bridge	$ 35,000	$35,000			$35,000
2	Monitoring (water, eels & insects)	$ 7,000	$7,000			$7,000
3	Pest & Weed Removal & Control	$ 10,000			$10,000 (KCDC)*	$10,000
4	Native Shrubs & Trees	$ 14,000	$8,000	$2,000 (TW) $2,000 (WR) $2,000 (RR)		$14,000
5	Whanau Wananga	$ 8,000			$8,000 (DoC)*	$8,000
6	Administration & Project Management	$ 30,000		$25,000 (TR) $5,000(NHO) $1,000(LWT)		$31,000
	GRAND TOTALS		**$50,000**	**$37,000**	**$18,000**	**$105,000**

DOC = Department of Conservation
TR = Taiao Raukawa Environment Unit
NHO=Nga Hapu O Otaki
WR = Whakatipuranga Rua Mano
RR = Retitia Royal Proposed Whanau Nursery
M = Milestone

Appendix 5 LWRP Action Plan – selection only

Lake Waiorongomai Action Plan 2012 -2015		Completed	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13
Research	Draft Research Monitoring Plan Developed	**Done 28/05/12**												
Plan	Research Plan Discussed with Supervisors	**Done 28/02/13**					Emailed RD							
	Research Plan Approved by Supervisors	**Done 28/02/13**												
Trust	Te Waari Call hui	**Done 14/11/12**					Discussed e	TW contactd	Hui 24/11					
	Update - Project proposal funding applying for	**Done 24/11/12**				CEF done			Endorsed					
	New Trustees, appointed & updated on www	On hold may not be necessary just yet.												
	Trust approval	**Done 24/11/12**							YES - TW wr	ting Endorsment letter				
	Kaitiaki group established	**Done 24/11/12**							YES - TW, CR	, TR, LH, AS, RR				
	Regular reports to Trust													
Ecology	Baseline study details discussed with Russell	**Done 30/07/12**												
	Monitoring Plan Draft after discussion with samplers	**Done 28/10/12**				Caleb hui	BackUp hui	Caleb quote	MP ok $	CR Contract				
	Monitoring Plan Approval Russell	**Done 28/02/13**					Yes draft							
	Baseline measured at Waiorongomai	**Done 30/04/13**							Contracted Caleb			Start 26/02	Aroha h2o,	macro inv
	Tuna person/s identified	**Done 06/06/12**				Caleb hui	BackUp hui	Caleb confirm	ed			1st Test		
	Bird society approached to see if want to be involved	**Done 08/04/13**									1st contact	Hui set up	Emailed	Hui - Reply
	TWOR to see if want to be involved & how	**Done 27/08/12**				Caleb hui	No not at this stage				Interested			Yes-koura
	Whakatupuranga to see if want to be involved & how	**Done 27/08/12**				Anihaera	YES					TR Hui		Yes-fish
	2013-5 Ecology Determinants identified	**Done 20/04/13**					YES RD					Discussed		Done
	Ecology Determinants approved, equipment, ready	**Done 25/04/13**												Completed
	Ecology Monitoring refer to plan (next sheet)	**Done 25/04/13**												Completed
Funding	Applying to who for what identified	**Done 03/08/12**		Min4Env, KCDC, GWRC, NWRahui										
	Fill in applications	Started				CEF done	On hold 4 trust ok		Endorsed		GWRC done		DOC done	
	GPS lake block	Surveyed early												
	Quote fence for block	Started									Topline, W Spinks, Initial quote done 25/04			
	Fence lake													
	Peizometers placed around lake	Hold next year?												
	Peizometers read regularly	Hold next year?												
	Neighbours approached re: clean stream & fence	Started							1A - YES			Erna & Hans initial chat		
	Stream neighbours approve clean & fence	Started							1A - YES			Elaine Bevan initial chat		
	Tree Planting days	Next Winter												
Matauranga	Oral Archiving kaumatua for Wairongomai memories	started	TW at lake 2010		George Grey at hui									
Maori	Maramataka for region	started						Made enquiries.		Some info in N.Toa book				
	Rupene's eel records collated	started												
	Tikanga for monitoring, visits, hui etc established	**Done 10/12/12**												
	Hapu associated with Lake identified	**Done 27/08/12**				Anihaera	support letter							
Resource	Plan for Nga Hapu o Otaki hui dates	started												Plan Nov
Planning	Plan for annual hakari dates & preparation	started												
	Plan for kaumatua interviews	Done 14/05/12												
	Plan for hunter gatherers interviews	started												
	Plan for tree planting dates	started												
	Plan for fencing	Done 27/08/12												

Appendix 6 LWRP Ecological Monitoring Plan – selection only

LW Ecological Monitoring Plan 2013 -2015		Person	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14
Water 3mth	Samples taken 4 sites (2 lake, 1 outlet stream, 2 inlet drains)	Aroha			26/03/2013	30/04/2013			22/07/2013						28/01/2014
	Samples analysed at Lab for Nitrates, Phosphates, E.coli	CEL			26/03/2013	10/05/2013			sent 22/07						
	Samples analysed at Lab for Chlorophyll a	Hill													
	Water temperature	Aroha													28/01/2014
	Dissolved oxygen logger, salt/conductivity meter - GRWC	Aroha				28-30/04/13			22-23/07/2013						4/02/14 Sent GRWC
	Received DO results	Alton				21/05/2013									
	Algae, weeds	Aroha				4/04/2013			22/07/2013						3/02/2014
	Turbidity - seechi disc	Aroha				08/04/2013 made it			22/07/2013						28/01/2014
Eel 6mth	Hinaki record night & sites, #, size, length, Age, Stomach	Caleb			Confirmed done set 25/03/2013						Confirmed done in Oct				
	Report	Caleb			Waiting		Reminder		Reminder		Waiting		Received first report		
Macro-inv 3	In the water, # & Species - 1 minute	Aroha				40/04/2013			23/07/2013						28/01/2014
	Photos & Vids of insects	Aroha				30/04/2013			22/07/2013						28/01/2014
Birds 3	On the lake, # & Species	NZ RFBS				Margarette Confirmed 08/04 Hikoi in August				3/08/2013					8/01 bad weather, 31/01 done
	Scout to find ideal bird watching site/s	NZ RFBS													8/01 bad weather, 31/01 done
	Report on Bird Monitoring	NZ RFBS								Received					
Fish 6	Set net results, # & Species	WRM				Rolly Confirmed 12/04/2013				Reminder			Reminder. RR will talk to CR		
Crustacea 6	Koura, # & Species	WRM				Caleb Confirmed 12/04/2013				Reminder			Changed to WRM.		
Shellfish 12	Check to see if fresh water mussel still exists at Wananga	Horima				05/04/2013 Confirmed Manaia will support Horima Carkeek in Summer								M.O confirmed avail	
Plant 12	Plant inventory	Tim/Pat													31/01/14 Done 5 RFBS, AS & LK
Footage 6	Photos & Vids of view points	ARoha			Done	Done			Done					Done	
*** Notes:**							*Duck shooting season								
								*Matariki time of learning - not collecting for kai							
KEY:															
Caleb	Caleb Royal - Hapai Consultants Ltd														
TWoR	Te Wananga O Raukawa Diploma & Degree in Environment Management Students														
NZRBS	New Zealand Forest & Bird Society & any interested hapu members														
WRM	Whakatipuranga Rua Mano - High School Science Students														

Appendix 7 LWRP Monitoring Resource Plan

Monitoring Resource Plan Equipment List 2013		Resources	Date
Details	Date, Day, Time	Paper, Pen, Clipboard, Folder, Dividers	26-Mar
	Temperature	Thermometer	26-Mar
	Weather	Internet access	26-Mar
Water	Samples taken - Lake & Stream	GPS Hand Held	10-Apr
	Turbidity - Lake	Seechi disc	15-Apr
	Flow - Stream	Velocity rod $220	N/A
	Algae	Microscope	4-Apr
	Samples analysed for Na, K, Ntrites, Nitrates	$15 / samples - (2x 4 per year, 3.5 years = 28 *15 = $420)	26-Mar
	Waders, Winter jacket	$15 / samples - (2x 4 per year, 3.5 years = 28 *15 = $420)	26-Mar
Eel	Hinaki record nights, NB: Maramataka	Hinaki x2, waders, 4WD	Caleb
	# of eels, species	Paper, Pen, Clipboard, Folder, Dividers	Caleb
	Size of eels	Measuring tape or board	Caleb
	Food in eels stomachs	Knife	Caleb
	Length of Otoliths	Knife	Caleb
	Age of Otoliths	Microscope	Caleb
Insects	In the water, # & Species	Fine scoop net. Sealed container with lid.	
Birds	In the area, # & Species	Binoculars, paper, pen, clipboard	FBS
Fish	Set net results, # & Species	Set net x2 $300 each	
Crustacea	Koura, # & Species	Dark container	
Shellfish	Check see if fresh water species still exists	Wetsuit. Diving Mask. Snorkel.	

Appendix 8 Te Ture Whenua Act 1993 Summary

Maori Reservations Regulations 1994 Summary - relevant to restoration.

8 Powers of Trustees

The trustees of any reservation may,

a) Authorise activities on the reservation by any person or class or persons:
b) Issue permits in relation to any activity on a reservation:
c) Apply to the court for any directions in relation to the administration of the reservation, and the powers and obligations of the trustees:
d) Call meetings of interested persons in relation to the administration of the reservation, and the powers and obligations of the trustees:
e) Appoint and employ, on behalf of the trustees, such advisers as the trustees think fit, for the purposes of enabling their better administration of the reservation.

9 Activities requiring prior written authorisation of trustees

The following activities on a reservation shall require the prior written authorisation of the trustee or trustees –

a) The use of any building on the reservation:
b) The promoting or holding of any hui, meeting or other large gathering of persons
within a reservation:
c) The promoting or holding of any sports event, competition, or concert within a reservation:
d) Such other activities or events as the trustees may from time to time determine require the prior written authorisation of the trustees.

10 Application for authorisation

Any person who desires to promote or hold on any reservation any activity of the kind referred to in section 9 (above) shall make a written application to the trustees.

The application shall state –

a) The full name and address of the applicant:
b) The particular activity for which consent is sought:
c) The area of land, and the buildings, that it is proposed be used or occupied, in relation to the activity:

d) The proposed date, and time or duration, of the activity:
e) The numbers of persons which the applicant proposes might attend the activity and the arrangements the applicant proposes for admission to and control of the activity.

14 Meetings of persons interested in reservation

The Trustees may if they consider it desirable and shall if required by order of the court, convene meetings of any persons interested in the reservation.

Such meeting shall –

a) Be held at the reservation or such other place as the trustees may think fit at such time, and for such duration as the trustees may determine:
b) Be chaired by a trustee, or a person nominated by the trustees:
c) Be notified if the trustees consider it desirable, by 14 days' notice being given by the trustees in a local circulating newspaper:
d) Be conducted in such manner as the chairperson of the meeting shall direct.

19 Annual meeting

The trustee or trustees of a reservation shall, call an annual meeting in each year, and give 21 days' prior notice of the time and place of the meeting –

a) By publishing, in a local newspaper, giving particulars of that time and place:
b) Provide other details as directed by the court.

The annual general meeting

a) Shall be open to the attendance of all beneficiaries or other persons for whose benefit the reservation is intended: and
b) Shall be chaired by a trustee, or a personated by the trustees; and
c) Shall be conducted in such manner as the chairperson of the meeting directs>

The trustee or trustees shall at the annual general meeting

a) Outline the position of the reservation, including the matters undertaken by the trustees in the preceding 12 month period; and
b) Report generally on the trustee' proposals for the administration of the reservation during the next 12 month period; and
c) Give to persons attending the meeting a reasonable opportunity to express their views in relation to the reservation.

Nothing above limits the matters that the trustees may address at the annual meeting or obliges the trustees to prepare or distribute any particular written reports or material.

Appendix 9 LWRP Memorandum of Understanding with KCDC

Memorandum of Understanding

The purpose of this document is to achieve better riparian management around Lake Waiorongomai at Ōtaki

The Kāpiti Coast District Council agrees to contribute towards this project (as detailed below) to enhance the water quality and biodiversity values of the area.

Subsidise the cost of fencing, weed control, planting preparation, planting and maintenance of riparian margins to a maximum cost of $5,000 per year.

By signing this document the current landowner agrees to the following:

- 50% of the project costs will be paid by the landowner or obtained from another source (e.g. Greater Wellington Regional Council)
- The project areas will be permanently retired from grazing
- The fences will be maintained to a stock-proof standard
- Within five years of fencing, the retired areas will be planted with native riparian species
- Only native plant species eco-sourced from the Foxton Ecological District will be planted in the retired area
- Pest plants and animals will be controlled in the retired area to ensure that any new plantings establish and there is progressive regeneration of native vegetation on riparian margins.

KCDC agrees to provide advice to ensure the ongoing success of this project.

This agreement is made on the _____day of _____ 201___.

Between:

The Landowner/s

Name: _____

Signature:_____

Kapiti Coast District Council

Name:_____.

Position:_____.

Signature:_____.

Appendix 10 LWRP Pest trapping results 2014-2017

Key: FE = Ferret, HH = Hedgehog, SP = Sprung, ST = STOAT, WS = WEASEL

	DOC 200 TRAP #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Date	**NAME**																													
3/5/14	markus	nil	nil	nil	nil	nil	nil	nil	**SP**	nil	nil	nil	nil	nil	nil	nil	nil	nil	HH	nil	nil	nil	nil	Nil	nil	nil	nil	nil	nil	nil
10/5/14	markus	nil	nil	nil	nil	nil	**ST (m)**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	Nil	nil	nil	nil	Nil	nil	nil
16/5/14	markus	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	SP	nil	nil	nil	nil	nil	nil	Nil	nil	nil	nil	**ST(m)**	nil	nil
22/5/14	markus	nil	SP	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	Nil	nil	nil	nil	nil	nil	nil
30/5/14	markus	nil	nil	nil	nil	nil	nil	nil	nil	**SP**	nil	**WL (f)**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	Nil	Nil	nil	nil	nil	nil	nil
5/6/14	markus	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**SP**	Nil	nil	nil	nil	nil	nil
14/6/14	Shane	nil	nil	**ST (m)**	nil	nil	nil	nil	nil	nil	nil	nil	nil	**SP**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	Nil	nil	nil	nil	nil	nil
21/6/14	Shane	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**SP**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**ST (F)**	nil	nil	nil	nil	nil
28/6/14	Shane	nil	nil	nil	**WL**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**SP**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
5/7/14	Shane	nil	nil	SP	nil	nil	nil	nil	**ST (m)**	nil	nil	nil	nil	nil	nil	nil	nil	Nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
12/7/14	Shane	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**FE (m)**	Nil	nil	nil	**SP**	nil	nil	nil	nil	nil	nil	**rabbit**	nil	nil

	DOC 200 TRAP #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
7/11/14	Landross	nil	nil	nil	nil	**FE**	**FE**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**FE**	nil	stoat	nil	nil	nil	nil	nil	nil	nil	nil
14/11/14	Landross	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**ST**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
30/11/14	Landross	nil	nil	nil	**FE**	nil	nil	nil	**ST**	nil	nil	nil	nil	nil	nil	nil	nil	nil	Nil	nil	ferret	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil

12/12/14	Landross	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**ST**	nil	nil	nil	nil	nil	**FE**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
10/01/15	Landross	nil	nil	nil	nil	nil	nil	nil	**FE**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	stoat	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
11/08/15	Matthew	nil	**ST**	nil	nil	**RAT**	nil	nil	nil	nil	stoat	nil	nil	nil	nil	nil	nil	nil	**FE**	nil	nil	nil	rat	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
5/09/15	Graham	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
15/11/15	Graham	nil	nil	nil	nil	nil	**RAT**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
12/12/15	Graham	**RAT**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	stoat	nil	stoat	nil	nil
16/01/16	Graham	nil	nil	nil	nil	**ST**	nil	nil	nil	nil	nil	**RAT**	**ST**	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**ST**	nil	**FE**	nil	nil	rat	nil	nil	nil
	DOC 300 TRAP #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**																
27/03/16	Graham	**HH**	**HH**	**HH**	**RAT**	nil	nil	**HH**	**ST**	nil	nil	**HH**	**HH**																					
23/04/16	Graham	nil	nil	**HH**	**ST**	nil	nil	nil	nil	nil	nil	nil	nil																					
28/05/16	Graham	nil	nil	**HH**	**HH**	nil	nil	**CAT**	nil	**HH**	nil	nil	nil																					
25/06/16	Graham	nil	nil	nil	nil	nil	nil	nil	nil	**ST**	nil	**HH**	nil																					
23/07/16	Graham	nil	nil	nil	nil	nil	**RAT**	**CAT**	nil	nil	**ST**	**HH**	nil																					
27/08/16	Graham	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	**HH**																					
29/09/16	GWRC	nil	nil	nil	HH	nil	nil	nil	weasel	nil	nil	nil	HH																					
24/10/16	Graham	rat	stoat	nil	nil	nil	nil	HH	nil	nil	nil	HH	nil																					
26/11/16	Graham	hedge hog	hedge hog	nil	HH	HH	nil	nil	nil	rat	HH	nil	nil																					
29/12/16	Graham	hedge hog	nil	rabbit	nil	nil	HH	nil	rat	nil	nil	HH	HH																					
21/01/17	Graham	nil	nil	nil	nil	nil	HH	HH	nil	nil	ferret	HH	HH																					
25/02/17	Graham	nil	hedge hog	rat	nil	HH	HH	nil	HH	HH	HH	nil	HH																					
25/03/	Graham	nil	nil	nil	nil	nil	HH	stoat	HH	ferret	HH	nil	nil																					

17																																		
22/04/17	Graham	nil	nil	nil	HH	nil	HH	nil	nil	ferret	HH	nil	HH																					
27/05/17	Graham	nil	nil	nil	nil	nil	HH	nil	nil	ferret	nil	nil	HH																					
17/06/17	Graham	nil	nil	nil	nil	nil	nil	nil	HH	nil	nil	nil	nil																					
27/07/17	GWRC	nil	nil	nil	nil	nil	nil	nil	nil	nil	stoat	nil	nil																					
21/08/17	Graham	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	HH	nil																					

Appendix 11 Interview Consent Form Template

ORAL NARRATIVE ARCHIVING FOR *(((Project Name)))*

CONSENT FORM

This research project is very committed to looking after the knowledge imparted by claimants in audio visual form. We will protect your information, as you desire. See the following and please tick the options that you agree to:

In order to achieve this we humbly seek your permission to:

Record your voice AND/OR record your moving image via video.

This will be downloaded with a copy made available to you and a master copy retained for the purposes of the *(((insert name)))* project and outputs.

Access for long term storage will be restricted as you determine.

Storage options are:

Te Wānanga O Raukawa

Alexander Turnbull Library

Hapū designated *(((insert hapū name)))* (please provide contact details)
Contact Name _____ Phone: _____
Email: _____

What access restrictions do you request? (NOTE: please tick below who **<u>can</u>** access)

General Public Iwi _____

Hapū _____ Whānau _____

If restricted, please provide the name and contact details of the person the repositories (storage location) must contact in order to release the interview video?
Contact Name _____ Phone: _____
Email: _____

Date of interview: **Location of interview:**

Print interview name/s:

Signed by interviewee/s:

(((NOTE: Page two on the reverse side of the consent form)))

(((Insert project name))) interview consent recording requirements

Main interviewer to fill out on the day:

Contact details of the person/s who the interviewee/s have agreed will sign off the transcript:

Interviewer/s name/s:

At least one interviewer signature:

Has any physical documents been provided by any of the interviewees? (Please list)

If yes, have they been copied/scanned and returned to the interviewee/s?

Were there any restrictions on the use of material?

Downloading person to fill out upon receiving:

Sign received:

Date:

Interview Ref. No:

Appendix 12 LWRP Accountability Report to GWRC

Iwi Project: Restoration of Lake Waiorongomai – Otaki

March 2013 – February 2014

Stage One Progress Report: March 2013 – 30 August 2013

Objective 1: Fence the Waiorongomai block, which includes the lake and stream. Develop agreement with all land owners to ensure no stock have access to the block once fenced.

Actions taken to date:

- Lake Waiorongomai 10 Trust Approval to fence the lake & stream block 24/11/2012.
- On 12/03/2013 Whaea Nelly Carkeek contacted Erna Winterburn-Somers upon request to inform her of the restoration project and seek her opinions.
- Further discussions with Elaine Bevan a major shareholder of Waiorongomai 1A in regards to the fence along the stream. 02/04/2013. She planned to inform her brother (one of the Waiorongomai 1A Trustees), it was envisaged he would bring this project up at their next hui.
- Two early quotes from fencing companies based on maps (Topline & Woody) completed by 25/04. Both fencers (plus Uncle Darkie, another local potential fencer) requested walking the site for a firm quote.
- On 02/05/2013 Whaea Nelly contacted Hans in regards to the Restoration Project and the potential funding for fencing depending on a riparian margin to plant native trees. He was pleased to hear this news and gave a positive verbal response to go ahead.
- On 27/05/2013 Aroha Spinks met with Kathy Simcox the Farmer who leases Waiorongomai 1A. She was very positive towards the Restoration Project including a potential 10m riparian zone along the stream. She informed Aroha that only two years ago she converted to organic farming and would love to see the Tuna Heke (eel run).
- On the 31st of July Aroha met with Hans and had a very positive conversation about the restoration project, funding from GWRC and the potential position for fencing. His main concern is water for his stock. We made a plan to visit the block and discuss further. Aroha was provided with a key.

Plan of actions to be completed in the next 3 months:

- By the 13th of September Aroha, Hans, Woody & Rangimarcus will walk the proposed fenceline, measure and GIS the main posts, as well as make a plan for how the trough system might work.
- Aroha plans to meet the Waiorongomai 1A Trust at their next hui to discuss the project, proposed fence and hopefully reach agreement on the distance from the stream.
- The fencing is on track to be erected in October/November.
- The November Wananga with the owners and beneficiaries will see the fencing in progress.

Objective 2: Identify indicator species (e.g. eels and develop a monitoring programme).

Actions taken to date:

- Identification of indicator species complete 30/07/2012. Eels (main indicator species), insects (most likely to bounce back in 3 years), birds, fish, fresh water mussels. Also water quality monitoring will be an important indicator of the restoration work improving the status.
- A proposed monitoring plan completed after initial discussion with samplers 28/10/12.
- Monitoring plan approved by Russell Death for Aroha's PhD 28/02/2013.
- Equipment (microscope, set net and temperature gauge) purchased in March. GRWC science department agreed to lend Aroha the Dissolved Oxygen logger. Alton Perrie calibrates then couriers to Aroha. Alton also downloads the results on return and emails to Aroha.
- Baseline parameters for water, eels and insects measured at Waiorongomai 30/04/2013.
- NZ Forest & Bird Horowhenua hikoi at the Lake, bird numbers were identified and documented in an initial report. They have proposed 3 Bird Counts a year starting in 2014. Rupene and Te Waari will take this to Nga Hapu o Otaki for approval.
- Aroha has conducted the second set of water and macro-invertebrate testing 22/07/2013.

Plan of actions to be completed in the next 3 months:

- By the 30th of September Caleb will complete his eel monitoring report for the samples taken in February. He will also have conducted another hinaki set.
- Nga Hapu o Otaki will review the NZ Forest and Bird Proposal for monitoring in 2014 by the 31st of October. Nga Hapu o Otaki will also consider an appropriate kaitiaki to accompany the bird watchers and learn their techniques.
- It is planned that freshwater mussels, fish, and koura will start in summer with the samplers being respectively Manaia Osborne & Mickey Carkeek, the students from Whakatupuranga Rua Mano (Teacher Rolly Raureti), and the Degree students in Putaiao at Te Wananga o Raukawa (Teacher Caleb Royal). In November a plan will

be developed with the Kura and Wananga teachers to ensure support, equipment dates etc is all set.

Objective 3: Pests and weed removal. Develop a plan for on going weed and pest control.

Actions taken to date:

- Caleb Royal identified a weed as probable hornwort in the lake during his hinaki set in February. Unconfirmed at that stage. Other known weeds; parsnip weed in the stream, arum lily in the mouth of the stream exiting the lake, black berry nearby on the southern drain entering the lake.
- Identification pests and weeds by Richard Anderson, Rangikauhoe (Rangimarcus) Heke and Rupene Waaka visit to the lake 11/03/2013.
- Pest control plan developed by Rangimarcus Heke 12/03/2013.
- Aroha took hornwort samples from the lake, photographed under the microscope, although not choked like Te Hakari it is in small amounts but wide spread 30/04.
- 8/5/ 2013 Aroha informed Tim Park (at the Kapiti Dune Hikoi) of the confirmed hornwort and its spread. Tim advised that he would take this up with his biosecurity team. Biosecurity have asked to visit the lake and have been informed to take along one of the kaitiaki (Te Waari, Rupene, Caleb, Rolly, Libby Hakaraia or Aroha).
- Te Waari, Mike Urlich and Rob Cross hikoi to the Lake on the 30th of July, included a discussion on weed control. Rob urged the project to target the weeds a.s.a.p. potentially before the planting program begins. Especially the southern drain area.

Plan of actions to be completed in the next 3 months:

- As mentioned earlier Rangimarcus will accompany the others for the fencing hikoi with the farmer, fencer and Aroha in early September.
- Aroha will draft both applications to KCDC for pest and weed control funding, from the Heritage Fund and Riparian Fund. Te Waari and Rupene will make final changes and submit to Rob Cross. Target date 30/09/2013.
- Depending on the success of these funding applications and advice from the GRWC Biosecurity Team weed control may start in October.
- The plan for pest control is that it will start as soon as the fence is erected, conducted by Nga Whenua trained Rangimarcus, late November.

Objective 4: Establish a robust planting regime of native shrubs and trees.

Actions taken to date:

- The native shrubs and trees endemic to this region and soil conditions have been identified 02/05/2013.
- Aroha received a tutorial from Tim Park 21/06/2013 on the GRWC website mapping tools. Aroha and Tim created a potential planting regime map.

- Taiao Raukawa developed maps for the Manaaki Taha Moana Project and have one for the Waiorongomai case study 28/07/2013. These aerial view maps are laminated and come with markers and an eraser to draw and develop planting regimes etc.

Plan of actions to be completed in the next 3 months:

- A planting regime is planned to be discussed at the Whanau Wananga of owners and beneficiaries in Early November. At this hui we plan to have experts provide propagation advice and encourage whanau to start seeding and caring for some baby natives. Planting is planned for winter 2014, the plants, locations of nodes and dates will all be decided by the whanau at this hui.
- We are currently awaiting the result of our application to DOC and the Bioadvice Fund. Results should be known by the 2/09/2013.

LWRP Accountability Report Attachment

Brief summary of objectives, actions to follow from 29/08/13 hui and timeline:

		Progress	WHO	Timeline
1.	Fence the Waiorongomai block, which includes the lake and stream. Develop agreement with all land owners to ensure no stock have access to the block once fenced.	Woody Spinks to ID with Hans, Rangi, Aroha & others the fence line that will be GPS/GIS	Aroha	Next 2-3 weeks
2.	Identify indicator species e.g. eels and develop a monitoring programme.	RW to chase up Caleb RE 1st report for February and 2nd report for August. RW/CR to do the August catch. RW to also check with Caleb whether Putaiao Tauira doing some testing and check also with Rolly and Kura Forest & Bird – offered to monitor – Aroha to supply their offer and the report to Rupene and TW for sign off from NHoO Water monitoring – Aroha undertaking	RW/CR	Next 2-3 weeks
3.	Pests and weed removal. Develop a plan for on-going weed and pest control.	Te Waari went out in July with GWRC/KCDC officials and they offered advice Aroha drafting KCDC applications Te Waari and Rupene will approve and submit Te Waari and Rupene will inform NHoO of progress	Aroha	
4.	Establish a robust planting regime of native shrubs and trees.	We have a list but defer to November 2013 Kaumatua interviews of plants in this locale continue	Aroha	

Appendix 13 LWRP action research reflection table 2012-February 2015

DATE	DESCRIPTION	Action Research Cycle Step
Prior to 2010	Whānau & Hapū concerns, discussions and hui between selves and with external experts.	Identify – LWRP 1
2011	Engaged Aroha to collate their material, research additional material and draft the LWRP Plan Report	Plan – LWRP 1
2011	Aroha provided draft to Te Waari and Rupene. Received comments. Made changes. Approved. Te Waari submitted to GWRC & reported to NHoO.	Plan – LWRP 1
20/06/12	Landscape Architecture Students designs and presentations of MTM local case studies in Wellington at the Victoria University School of Architecture and Design. Te Waari Carkeek and Nellie Carkeek attended to view LW designs.	Identify – LWRP 1
30/07/12	Identification of indicator species complete. Eels, aquatic insects, birds, fish, fresh water mussels. Also water quality monitoring will be an important indicator of the restoration work improving the status.	Identify – Monitor 1
28/10/12	A proposed monitoring plan completed after initial discussion with potential samplers.	Plan – Monitor 1
24/11/12	Lake Waiorongomai 10 Trust, hapū and whānau hui. Aroha tono to conduct PhD research in a supportive role for the LWRP. Approved by those present as well as plan to fence block 10 (lake & stream).	Identify – LWRP 1 Identify – Fence 1
	Landscape Architecture Student designs of LW on display. Designs given to the whānau and hapū of LW. Reciprocity.	Identify – LWRP 1
14/02/13	Hui with Harina Cooper - Whakatupuranga Rua Mano (WRM) Principal updated he on the LWRP. She advised she would discuss student involvement with the kura whānau.	Identify – LWRP 1
15/02/13 (Mid-Feb)	Eel Monitoring by Caleb Royal (Waiora Solutions Ltd)	Action & Observe – Monitoring 2
	Caleb Royal identified known weeds; parsnip weed in the stream, arum lily in the mouth of the stream exiting the lake, black berry nearby on the southern drain entering the lake.	Identify – Weed 1
	Caleb Royal also identified an aquatic weed of concern - probable hornwort in the lake during his hīnaki set in February. Unconfirmed at that stage.	Identify – Weed 2
26/02/13	Aroha photos and videos of Lake Waiorongomai. 360^{o}C	Identify – LWRP 1
28/02/13	Monitoring plan approved by Russell Death for Aroha's PhD	Plan – Monitor 1

10-15/03/13	MTM Landscape Architecture students from Victoria University week wānanga. Staying at Tukorehe Marae. Aroha planning for the LW presenters, hīkoi, karakia etc	Identify – LWRP 1
11/03/13	Identification pests and weeds by Richard Anderson, Rangikauhoe (Rangimarkus) Heke. LW hīkoi with Rupene Waaka & Aroha.	Identify – Weed 1
12/03/13	Aroha took the LW group of LA Students to LW through Ōtaki township, outside views of the 2 marae, visit TWoR and Ngā Purapura, Ōtaki river, hīkoi Ōtaki beach and research in Ōtaki library	Identify – LWRP 1
12/03/13	Whaea Nelly Carkeek contacted Erna Winterburn-Somers upon request to inform her of the restoration project and seek her opinions. Whaea Erna informed Whaea Nelly that she had made her husband Hans Winterburn-Somers power of attorney for her estates. Whaea Erna is the major shareholder of Waiorongomai 3B2 block surrounding the lake. Hans currently farms this area as the leasee.	Identify – Fence 1
12/03/13	Pest control plan developed by Rangimarkus Heke & quote.	Plan - Weed 1
14/03/13	Oral interview Te Waari Carkeek during hīkoi at Lake Waiorongomai.	Identify – LWRP 1
	Landscape Architecture students hīkoi to LW. Te Waari, Rupene, Rolly Raureti and 7 WRM Students also attend.	Identify – LWRP 1
31/03/13	Equipment (microscope, set net and temperature gauge) purchased in March.	Plan – Monitor 1
	Hui with Russell Death and Alton Perrie GRWC. GRWC science department agreed to lend Aroha the Dissolved Oxygen logger.	Plan – Monitor 3
01/04/13	Signed GRWC lending agreement	Plan – Monitor 3
02/04/13	Further discussions with Elaine Bevan a major shareholder of Waiorongomai 1A in regards to the fence along the stream.	Identify – Fence 1
	She planned to inform her brother (one of the Waiorongomai 1A Trustees), it was envisaged he would bring this project up at their next hui.	Plan – Fence 1
12/04/13	Hui with Caleb re: eel results. All measurements done including otolith. Just to write up report. Informed Aroha of sighting the aquatic weed 'hornwort'. The first known sighting in LW.	Reflecting – Monitor 1
16/04/13	Hui with GWRC Lee Rauhina-August, Te Waari & Rupene. Discussion about potential funding.	Identify – LWRP 1
17/04/13	Aroha received the calibrated Dissolved Oxygen Meter from GWRC Alton Perrie.	Plan – Monitor 2
22/04/13	Hui with Te Waari and Rupene. Approved the DOC Bioadvice Funding Application. They recommend updates and changes to the GWRC LWRP funding proposal.	Identify – LWRP 1
	Aroha then received approval from Huhana Smith (Chair of Taiao Raukawa & MTM project leader). Application sent in to DOC. Application is for the LW project but submitted by Taiao Raukawa.	
25/04/13	Two early quotes received from fencing companies based on maps (Topline & Woody). Both fencers (plus Uncle Darkie, another local potential fencer) requested walking the site for a firm quote.	Identify – Fence 1
28/04/13	Installed the DO Meter.	Action – Monitor 2

30/04/13	Aroha and Hayden Jacobs hīkoi at LW to collect water & macroinvertebrate samples	Action – Monitor 2
	Aroha took hornwort samples from the lake, photographed under the microscope, although not choked like Te Hakari it is in small amounts but wide spread.	Identify – Weed 2
30/04/13	Alton Perrie calibrates DO & Salt meters then couriers to Aroha. Alton also downloads the results on return and emails to Aroha.	Observe – Monitor 3
02/05/13	Whaea Nelly contacted Hans in regards to the Restoration Project and the potential funding for fencing depending on a riparian margin to plant native trees. He was pleased to hear this news and gave a positive verbal response to go ahead.	Identify – Fence 1
02/05/13	The native shrubs and trees endemic to this region and soil conditions have been identified 02/05/2013.	Identify – Plants 1
08/05/13	Aroha informed Tim Park (at the Kapiti Dune Hīkoi) of the confirmed hornwort and its spread. Tim advised that he would take this up with his biosecurity team.	Identify – Weed 2
	Biosecurity have asked to visit the lake and have been informed to take along one of the kaitiaki (Te Waari, Rupene, Caleb, Rolly, Libby Hakaraia or Aroha).	Identify – Weed 2
8/05/13	Met with Tim Park & Michael Urlich from GWRC, Rob Cross from KCDC and Edwardo from DOC. Discussed the opportunities and the restoration plans for LW.	Identify – LWRP 1
09/05/13	Oral interview Betty Raureti, Borja Hakaraia, John Huff at Te Wānanga o Raukawa - Ngā Purapura, Pipireka café hui then interview in small class room, Ōtaki	Identify – LWRP 1
20/05/13	Hui with Whaea Nellie Carkeek who inform Aroha that she had spoken to Hans & Erna again. This time to discuss the positive feedback from GWRC regarding funding for the fencing of LW. Hans agreed after hearing that the fence, troughs & gates would be funded. "Go ahead" was his instructions.	Identify – Fence 1
	Aroha then informed Te Waari and Tim Park.	
21/05/13	Hui at Taaringaroa, GWRC (Lee Rauhina-August), Te Waari, Rupene, Caleb, Aroha. Details of LWRP plans and approval by Trust and Leasee discussed. Lee agreed to funding the project from her department. Lee to write up the contract & conditions.	Identify – Fence 1
22/05/13	Murray Patterson – Aroha's main supervisor for PhD suggests to conduct the PhD Research Proposal hui at the marae in Ōtaki	Plan – LWRP 1
27/05/13	Aroha Spinks met with Cathy Simcox the Farmer who leases Waiorongomai 1A. She was very positive towards the Restoration Project including a potential 10m riparian zone along the stream. She informed Aroha that only two years ago she converted to organic farming and would love to see the Tuna Heke (eel run).	Identify – Fence 1
20/06/13	Landscape Architecture design exhibition & presentations in Wellington. Severe weather warnings. The planned bus trip to take WRM kura students to see the designs had to be changed. So Aroha and Rolly took the students to Te Takere (Lirary and resource centre) in Levin. Activities and environmental research.	Identify – LWRP 1

21/06/13	Aroha received a tutorial from Tim Park on the GRWC website mapping tools. Aroha and Tim created a potential planting regime map.	Planning – Plants 1
	Tim Park requested $3k from the GRWC Budget to go towards traps for the pest control for this project.	Identify – Pests 1
28/06/13	Jaimie McFarlane produces the MTM maps, including 1 for LW.	Identify – LWRP 1
17/07/13	Oral interview George Gray at Hadfield Street, Ōtaki.	Identify – LWRP 1
12/07/13	Hui with Te Waari re: LWRP plans. He recommends wānanga when fence is going up. Then the whānau see it in action.	Plan – LWRP 1
22/07/13	Aroha conducted the second set of water and macro-invertebrate testing.	Action & Observation – Monitor 3
25/07/13	Aroha, Iritana & Hine pick up the DO meter & courier it to Alton.	Action – Monitor 2
28/07/13	Taiao Raukawa developed maps for the Manaaki Taha Moana Project and have one for the Waiorongomai case study. These aerial view maps are laminated and come with markers and an eraser to draw and develop planting regimes etc.	Identify – LWRP 1
30/07/13	Te Waari, Mike Urlich and Rob Cross hīkoi to the Lake, included a discussion on weed control. Rob urged the project to target the weeds a.s.a.p. potentially before the planting program begins. Especially the southern drain area.	Identify – Weed 1
31/07/13	Aroha met with Hans and had a very positive conversation about the restoration project, funding from GWRC and the potential position for fencing. Nellie organised the hui & introduced Aroha to Hans.	Plan – Fence 1
	His main concern is water for his stock.	Identify – Trough 1
	We made a plan to visit the block and discuss further. Aroha was provided with a key.	Plan – Fence 1
01/08/13	PhD Confirmation Hui at Taaringaroa. Huhana MTM presentation. Aroha LW PhD research proposal presentation. Approval received from hapū members. Approval & confirmation by academic board.	Plan – LWRP 1
03/08/13	LW Hīkoi with Forest & Bird monitoring people to find the best bird watching spot. Te Waari Carkeek, Mickey Carkeek and Retitia came too. Te Waari conducted the karakia & gave a korero about the location & history. Kai provided at Taaringaroa after by whānau. Tikanga & Manaakitanga.	Plan – Monitor 4
31/08/13	NZ Forest & Bird Horowhenua Hīkoi at the Lake, bird numbers were identified and documented in an initial report. Received.	Action & Observe – Monitor 4
	They have proposed 3 Bird Counts a year starting in 2014.	Plan – Monitor 4
	Rupene and Te Waari will take this to Nga Hapū o Otaki for approval.	Plan – Monitor 4
01-13/09/13	Landscape Architecture top MTM student designs exhibited at Te Takere in Levin. Two LW projects included. Agenda: Mihi (Moira), Introduction (Aroha), MTM overview presentation (Huhana), Victoria Uni partnership (Penny), Questions, 2x Landscape Architecture presentation, Questions then Afternoon Tea & mingle	Identify – LWRP 1

10/09/13	Aroha had a number of hui between July and September with Ngā Whenua Rāhui (DoC) staff members Richard Anderson and Rangimarkus Heke in Kuku regarding LW. Also one hīkoi.	Identify – LWRP 1
	Today received their professional advice in writing.	
11/09/13	MTM Horowhenua regional case study received DoC Kaitiakitanga award. Powhiri at Raukawa Marae. MTM gave each hapū case study a local case study map produced by Jaimie McFarlane as koha. Reciprocity. Giving back to hapū an acknowledgement of their input	Reflection – LWRP 1
13/09/13	Sent GWRC Tim Park the kaitiaki approved LWRP Progress Report for Phase 1 funding. Te Waari took a copy of the report to the next NHoO hui to discuss with the whānau & hapū. Also called Tim.	Reflection – LWRP 1
	NHoO will review the NZ Forest and Bird Proposal for monitoring in 2014 by the 31st of October. NHoO will also consider an appropriate kaitiaki to accompany the bird watchers and learn their techniques.	Plan & Identify – Monitor 4
	It is planned that freshwater mussels, fish, and koura will start in summer with the samplers being respectively Manaia Osborne & Mickey Carkeek, the students from WRM & Teacher Rolly Raureti, and the Degree students in pūtaiao at Te Wānanga o Raukawa (TWoR) Teacher Caleb Royal. In November a plan will be developed with the Kura and Wānanga teachers to ensure support, equipment dates etc is all set.	Plan – Monitor 3-5
16/09/13	Aroha, Rangimarkus Heke and Hans Somers, site visit 11 am 16th September. Discussions occurred during the Hīkoi and agreement was met of where the fenceline should be located given a couple of metres either side.	Plan – Fence 1
	Rangimarkus took GPS coordinates of the agreed points.	
	Aroha met Erna Winterburn-Somers when she dropped Hans at home. Had a discussion about her connection to the lake.	
20/09/13	Aroha received the map from Rangimarkus via email	Plan – Fence 1
21/09/13	Aroha and Kaitiaki started to arrange site visits by potential fencing contractors.	Identify 2 – Fence 1
25/09/13	GWRC Management approved Tim Parks request. The traps were purchased in October and stored in Lower Hutt by GRWC. Aroha informed Rangimarkus who will conduct the pest control mahi.	Plan - Pests
07/10/13	Aroha and her dad (Peter Spinks an ex-farmer) visited the site and discussed where the troughs, pump and solar should go for the cows. Hans arrived and joined in on the discussion.	Plan – Troughs 1
01/10-25/11/13	Aroha and kaitiaki conducted hīkoi with fencers	Plan 2 – Fence 1
	Aroha and kaitiaki gained further firm quotes from a number of fencing contractors who walked over the whenua.	Plan 2 – Fence 1
	The quotes were similar and identified that it would cost approximately $70,000 to fence the entire Block 10.	Plan 2 – Fence 1
	This was to be expected as Tim Park had informed the kaitiaki and Lee Raugina-August at a hui in August at Taaringaroa (in Otaki) that the likely costs for fencing a block this size with a robust fence would be high.	Reflection 2 – Fence 1

		Disruption Cycle 2 – Fence 1.
	Te Waari Carkeek and Rupene Waaka then made the decision to only fence the Lake and first part of the outgoing stream that is neighbouring Block 3B2, this year. Phase 1 – Fence LW (Block 10 & neighbouring blocks 3A, 3B1, 3B2, 3B3), Phase 2 – Fence WStream (Block 10 & neighbour block 1A)	Identify – Fence 2
08/11/13	Phone call with Alton Perrie (GWRC Science Department) discussed water quality results to date	Plan – Monitor 2
12/11/13	Hui with Te Waari re: update on LWRP progress	Plan – LWRP 1
15/11/13	Rae ki te rae – Huhana Smith exhibition in Wellington incorporated environmental messages and MTM research within her paintings.	Reflection – LWRP 1
19/11/13	Rae ki te rae exhibition wānanga with WRM students. Presentations (Wellington City Gallery, Huhana MTM, Aroha LW, Rupene Kaitiaki) at WRM in Ōtaki. Then hīkoi at LW. Student sketches.	Reflection – LWRP 1
22/11/13	Caleb & Aroha hui about eel monitoring report, 10am.	Observe – Monitor 2
	Aroha raised issue of fencing quotes currently from non-iwi members only.	Identify 2 – Fence 2
	Caleb rang Jeremy (Skip) Skipper who had recently enquired about fencing mahi – iwi connections. Available for hīkoi the next day.	Plan 2 – Fence 2
23/11/13	Aroha & Skip hīkoi at Lake Waiorongomai.	Action 2 – Fence 2
25/11/13	Gave $100 koha to Whakatupuranga Rua Mano admin as koha for petrol and pizza in preparation for Rae ki te rae Wellington trip.	Plan – LWRP 1
28/11/13	Rae ki te rae - Whakatupuranga Rua Mano art students trip to Wellington City Gallery and Vic Uni Landscape Architecture Wellington cancelled.	Action – LWRP 1 Disruption to cycle
	Tim developed a Key Native Ecosystem (KNE) Plan for this project in November. Aroha reviewed this document and recommended changes.	Identify – LWRP 2
29/11/13	MTM Presentation at Maori and Indigenous Research Conference in Auckland.	Reflection – LWRP 1
29/11/13	Taiao Raukawa received notice that the DoC approved the application to hold a Wānanga to support the hapū and this project.	Identify – Wānanga 1
	It was then planned by Te Waari and Rupene to be held 22-23rd of February 2014.	Plan – Wānanga 1
30/11/13	Aroha drafted a Memorandum of Understanding for the Kapiti Coast District Council (KCDC) Riparian fund in November. Kaitiaki reviewed & approved. Aim to find funds towards native plants.	Identify – Plants 1
	As well as a Heritage Fund Application and Heritage Management Plan. Aim to find funds towards weed control.	Identify – Weeds 1

13/12/13	Aroha and Hans had coffee at Café Ra in Otaki and discussed the outline of fence and GPS coordinates on the map provided by Rangimarkus. Aroha talked through a Memorandum of Understanding with Hans and she wrote that down as they discussed the details together. Aroha then read through all the details again to ensure Hans was comfortable with the agreement written on the back of the map. Hans then signed that he was in agreement to that statement.	Plan – Fence 2
15/12/13	Skip provided fencing quote for phase 1 to Aroha.	Observe 2 – Fence 2
17/12/13	Oral interview Ariana Te Aomarere at Iti Street, Ōtaki.	Identify 1 – LWRP 1
17/12/13	Te Waari and Rupene approved the quote by Jeremy (Skip) Skipper to start the fencing of Lake Waiorongomai.	Reflection 2 – Fence 2 (also Plan – Fence 2)
18/12/13	Aroha provided Hans, Rupene Waaka (Nga Hapū o Otaki Chairperson and Kaitiaki) and Huhana Smith (Taiao Raukawa Chairperson) with copies of the map and Memorandum of Understanding for their files.	Plan – Fence 2
21/12/13	Karakia at the lake (10am), those present Te Waari Carkeek, Rupene Waaka, Ariana Te Aomarere, Tanira Cooper, Eila Paul, Huhana Smith, Moira Poutama, Aroha Spinks, Jeremy (Skip) Skipper, Jay Skipper, and Hans Somers. Rupene discussed the protocol of any discoveries made during digging. Photos & videos by Moira Poutama.	Plan – Fence 2
22/12/13	There was a delay in ordering and receiving some necessary materials from Farmlands over the Christmas period. The contractor Skip also received the offer of Roy Winterburn's tractor and Rammer which ideally would speed up and make the job easier. So they decided to wait for the machinery. The initial fencing team consisted of Skip, Roy and Tanira.	Disruption Cycle on HOLD – Fence 2
06/01/14	The first post went into the whenua.	Action – Fence 2 (also Action – LWRP 1)
11/01/14	All the strainer posts and wires were in place for the eastern fence and battening had started.	Action – Fence 2
	Ngāti Maiotaki Block 9 owners had a wānanga and viewed their block as well as the Lake Waiorongomai Block 10 fence in progress.	Observation – Fence 2
	Positive feedback was received by these whānau and hapū members. Those present were informed of the Lake Waiorongomai Restoration Wānanga to be held the following month.	Reflection – Fence 2
	Aroha was informed by Rupene of the eastern fence being out of alignment with the agreed boundary line.	Identify 2 – Fence 2
	She was informed that the fencers contacted Rupene in regards to moving the fence out of the really wet area to ensure the integrity of the fence was maintained.	Plan 2 – Fence 2
	Rupene approved this decision.	
	Fencing on east side of lake continued in new direction.	Action 2 – Fence 2
12/01/14	Aroha visited Hans and had a hui to discuss the new eastern fenceline. Hans informed Aroha that he had seen the	Identify 3 – Fence 2

	fence and was okay with fencers reasoning and appreciated her visit.	
21/01/14	Hui with Skip re: fencing alignment, progress and options for water troughs, 3pm.	Reflection – Fence 2 Plan – Troughs 1
27/01/14	Hans called Aroha to raise his concern that although he had thought it was slightly out at the gate and the north, the southern end he had just discovered was out by a long way and could battening of the eastern fence halt.	Observation 2 – Fence 2
	Aroha called Rupene and Te Waari who both agreed and battening of the eastern fence stopped.	Reflection 2 – Fence 2
	Aroha contacted fencers to hui after work and to stop battening the eastern fence. This held up fencing progress.	Identify 3 – Fence 2 <u>Disruption</u> to first cycle – Fence 2 on HOLD
	Fencing continued on south-west fence.	Action 3 – Fence 2
	Hans agreed to keep a closer eye on the western fence lines.	Observation 3 – Fence 3
27/01/14	Aroha called Rangimarkus (Ngā Whenua Rāhui) to discuss the fence problem and request assistance with GPS	Plan 3 – Fence 2
28/01/14	Rangimarkus met Aroha, Huhana and Richard Anderson (Ngā Whenua Rāhui) at the site on the 28th of January. Rangimarkus took the new GPS coordinates of the new fencelines to compare to proposed.	Action 3 – Fence 2
	However the map could not be produced from the GPS data due to the new GIS computer getting lost within Department of Conservation (DoC).	Observation 3 – Fence 2 <u>Disruption</u> to cycle 3 so Fence 2 remains on HOLD
	Monitoring water & insects Aroha, Iritana, Ariana, Pikitia – Photos by Huhana	Action & Observe – Monitor 2
31/01/14	A plant inventory hīkoi occurred that included Tim Park, Pat Enright (Botanist), Aroha, Lisa (Lil) Keen (Ngati Raukawa, Ngati Kauwhata kaitiaki and new student at Te Wānanga o Raukawa studying Putaiao) as well as 5 Forest and Bird Society Members (also Waitohu Streamcare Group members) who were passionate about plants.	Action & Observe - Monitor 5
	During this site visit Tim removed a few weeds, identified and took GPS coordinates for others.	Identify 2 & Action 2 – Weed 1
	Seeds were collected and some were thrown about by Tim, Aroha and Lil from Purei (sedge) and Sand Caprosma.	Action - Plants 2

	Forest and Bird Society members did bird count.	Action & Observe Monitor 4
	Aroha spoke with Hans on site at the southern west fence line and he was happy with the progress there. Strainers were being rammed into place that day.	Reflection – Fence 3
01/02/14	Fencers identified and informed Aroha that the Waiorongomai Stream cattle crossing needed replacing & the northern drain required a culvert. Aroha discussed with RW & TC.	Identify – Culvert 1 (also Reflection - Fence 3, Reflection 3 – Fence 2)
02/02/14	Aroha had discussions with Block 1A Trustees, Nick Allen & Robert (Tipi) Bevan about the need to upgrade and modify the current Waiorongomai Stream culvert to be fish friendly.	Identify – Culvert 1 (also Reflection 3 Fence 3)
	Nick requested a visit to the site.	Identify – Culvert 1
	Aroha also spoke to Kathy Simcox the farmer leasing the property.	Identify – Culvert 1
03/02/14	Lil took the seeds collected and a rare tiny fern found in the paddock to the Waitohu Stream Care Group hui. Asking them on behalf of whānau & hapū if they could grow these on and some should be returned to Waiorongomai at a later date. Lil was placed in charge of these seeds and plants. Lil continues to visit the Waitohu Stream Care Group hui when she can.	Identify 2 – Plants 2 Action 2 – Plants 2
04/02/14	Aroha accompanied Nick on hīkoi to show him the design and location of the culvert, at that time he also saw the fence in progress on the neighbouring property.	Plan – Culvert 1 (also Observe 3 – Fence 3 & Fence 3)
	Nick, Robert and Kathy all agreed with the proposed culvert. \	Plan – Culvert 1
	Nick wrote a letter to the Responsible Maori Land Trustee.	Plan – Culvert 1
	Rupene and Aroha hui re: actions to date &discuss issues and potential solutions going forward, 2pm.	Reflection & Identify - LWRP 1
05/02/14	Aroha and Skip had a hui to discuss the fencing project and cost of materials to date. The project appeared on budget. Aroha and Skip got breakdowns of all the material costs to date from Farmlands. They also obtained quotes from Farmlands for the culverts.	Plan – Culvert 1
12/02/14	Skips quote - the stream culvert 5m has a material cost of approximately $5,000 and $3,500 for the Northern drain culvert. Roy quoted the cost of the digger to be $3,000 to dig both areas out, install the culverts, pack the dirt around the culverts and shape the banks over a 4 day period.	Plan – Culvert 1
13/02/14	Rupene and Te Waari considered this cost is outside the current budget so at this stage this component has been placed on hold until further funding is sort. This is noted however as critical to the project to not only keep the cows	Identify – Culvert 1 Disruption of cycle on

	out of the lake and stream but also to ensure that fish can travel through the water bodies increasing the biodiversity and providing food to the eels etc.	HOLD
	Plan to include 2x culverts in Phase 2 GWRC funding proposal.	Plan – Culvert 1 Disruption of cycle on HOLD
	Idea by Rupene on discussion of the issue with Aroha to use temporary electric fencing from earlier GWRC funding resources stored in his garage.	Identify – Fence 4
	Te Waari agreed with the proposal. Plan - use temporary fencing at both culvert locations. Requested Aroha to organise with Skip.	Plan – Fence 4
15/02/14	Aroha and Hayden Jacobs (Ngati Raukawa, Ngati Wehi Wehi and recent Pūtaiao Graduate from Te Wānanga O Raukawa) visited the lake and collected Purei seed to distribute at the Restoration Wānanga on the 22nd.	Action 3 – Plants 2 Plan 4 – Plants 2
16/02/14	Spoke to Horima Carkeek re: leading the search with the whānau for Kākahi at the LWRP Project planned hīkoi to Lake Waiorongomai.	Identify – LWRP 1, Plan - Monitor 6
17/02/14	Hui with Rupene at 9am to discuss plans and preparation for LWRP Wānanga.	Plan 1 – LWRP 1
	Oral interview with Tim Park, Moira Poutama, Aroha Spinks at GRWC head office in Wellington, 11am.	Reflection – LWRP 1
18/02/14	Hans gave approval to continue battening the eastern fence given the Wānanga approaching, GRWC and the whānau proposed site visit on the Saturday and the fact that the Ngā Whenua Rāhui map couldn't be downloaded due to IT troubles.	Reflection – Fence 2 HOLD RELEASED Action – Fence 2
	He also gave approval to erect the Kaumatua Marquee on the block 3B2.	Plan – Wānanga
19/02/14	Unfortunately for unforeseen circumstances and busy schedules the KCDC funding applications were not submitted in 2013. However the Memorandum of Understanding was submitted to KCDC Rob Cross on the 19th of February along with the Heritage Management Plan.	Identify – Plants 1 Identify – Weeds 1
20/02/14	Hans and Aroha site visit to discuss fencing & wānanga	Reflection – Fence 2 & Fence 3
21/02/14	Rangimarkus emailed Aroha the GPS map on the afternoon	Observe – Fence 2 No longer a disruption to cycle 3
	After receiving the news that the fence is almost completed. Rangimarkus confirmed that pest and weed control can start on the second or third week of March.	Plan – Pests 1
21/02/14	Anonymous organisation informed Aroha that they have allocated a budget of 2000 native trees to the Lake	Identify 2 – Plants 1

	Waiorongomai Project and is waiting for management approval.	
22/02/14	Lake Waiorongomai Restoration Wānanga 22-23 February for the owners of Blocks 1A, 3A, 3B1, 3B2, 3B3, and 10 (Lake). Refer to programme.	Action – Wānanga
	Morning – Te Waari karakia & opening, then oral narrative of LW, RW commentary of the programme. First day for whānau & hapū.	Reflection – LWRP
	On Saturday afternoon the whānau visited the Lake and saw the eastern fenceline complete and the other side in action (north western).	Observation – Fence 2
	Monitoring demonstrations – Caleb eels, Aroha aquatic insects	Action – Monitor 2 & Monitor 3
	Pataka Moore took the whānau on a seed spreading mission on the eastern side of the lake in the muddy edge near the gate. Purei, raupo & tangata upoko seeds. The whānau enjoyed this very simple exercise a lot.	Action 4 – Plants 2
22/02/14	Aroha provided Hans with a copy of the new fence GPS coordinates map at the Wānanga. Aroha and Hans discussed the southern end of the eastern fence being a great distance away from the agreed fenceline. However they also discussed that most of this area is not within the Block 3B2, it is in fact in Block 3B3 which is owned by 109 different owners. Some of which were present at the Wānanga.	Observation – Fence 2
	Rupene informed them to speak to their whānau in case a hui needed to be called in order to approve the location of the fence.	Identify – Fence 2
23/02/14	Wānanga – second day. Powhiri to welcome guests, presentations in the morning & workshops for the whānau in the afternoon.	Reflection – LWRP 1 Reflection – Monitoring Identify – LWRP 2
	The kaitiaki and owners received confirmation from Rob Cross who presented at the Wānanga of their successful application to the KCDC Riparian Fund of $5,000 towards weed control and plants.	Identify – Plants 1 Identify – Weeds 1
	In one workshop kaumatua were asked what the dominant species were when they were young. Plus the whānau were asked to provide their ideas for a planting plan this year given the advice and recommendations they had received that day from presenters. The whānau at the Wānanga decided meet on the second weekend of each month to plant, excluding May due to duckshooting season.	Plan – Plants 1
28/02/14	Aroha hui with Skip – update on the fencing contract. The eastern fence is complete.	Action - Fence 2 COMPLETE
	The south and north western fences running along the lake and down the stream are in progress with all strainer posts	Action – Fence 3

	in, wires attached and battening in progress along the southern side.	
	The solar panel is working well.	Action – Trough 1
	The pump that should be sufficient has been set up	
	Although at the moment there are difficulties in getting it to function efficiently	Identify 2 – Trough 1
	A second team is arriving to fix the situation.	Plan 2 – Trough 1
	Three troughs with piping to the pump are set in place ready to go.	Action – Trough 1
01/03/14	Hans provided Aroha with a verbal confirmation that the eastern fence can remain where it is.	Reflection – Fence 2
03/03/14	Skip informed Aroha that the fencing should be finished by the end of the week at the very latest 14th of March.	Plan – Fence 3
03/03/14	During the meeting in Otaki, Tim, Rob, Rangimarkus, Aroha and Te Waari discussed the pest, weed, planting plans for the project this year. Rangimarkus informed the group that the traps can be set on the week of the 17th of March. The weed control will start at the next sunny day later next week. After the hui, Rangimarkus and Tim took a site visit to the stream mouth to identify some of the noxious weeds recently dumped there which are currently in low numbers so that they are taken out asap before getting out of hand.	Plan – LWRP Plan – Pests 1 Plan – Weed 1 & Weed 2 Plan – Plants 1
	Discussed that at the LWRP Wānanga one of the workshop suggestions was to get the whānau out into the Lake removing hornwort by hand. Placing the weed on Raupo Rafts made by the Kura kids at Whakatupuranga Rua Mano or the weavers at Te Wānanga o Raukawa. Then the weed could be placed on top of the dune and dry areas to mulch back into the soil and provide nutrients for the proposed winter planting. This idea was discussed on the 3rd of March however it was decided that it may promote the spread of the weed so at the moment it was decided to wait for further expertise advice. Tim is going to follow up with GRWC Biosecurity team and request a site visit. Horizons is working on a hornwort strategy for their region and Rangimarkus will keep Aroha up to date with progress.	Plan – Weeds 2
	Tim, Rob, Rangimarkus, Te Waari and Aroha discussed the planting plan, KNE and plant inventory. Aroha is following up with the nurseries able to provide Foxton/Kāpiti Coast eco-sourced plants to provide quotes on the ideal species to plant in the wetland and dune habitats. Harakeke and Sedge spreading is planned for the months of March and April. May might involve a Wānanga on planting and propagating native trees in whānau back yards. It is planned to plant the dunes over the winter months of June (8th), July (12th) and August (9th).	Plan – Plants 1
05-07/03/14	MTM Landscape Architecture Students Wānanga.	Identify – LWRP 1
06/03/14	The weavers and the weaving tutor at Te Wānanga o Raukawa were invited to join the Taiao Raukawa Wānanga for the Victoria University Landscape Architecture students presentation by Rangi Te kanawa (Te Papa Harakeke expert) on the 6th of March. They agreed to come on the site visit to Lake Waiorongomai to identify and whakapapa the harakeke and discuss its ideal uses. It has been suggested that the weavers might assist in the harakeke translocating exercise to use the off	Disruption of cycle Plan – Plants 3

	cuts for their purposes. Unfortunately a nearby block of land was on fire when the group approached the lake, access was not possible. This visit was postponed until late April.	
10/03/14	Aroha received an email from Rob and Tim outlining eco-sourcing options and suggesting spot spraying. This will be considered by kaitiaki however it needs to be noted that this has not been included in the current budget.	Identify – Plants 1
13/03/14	Aroha received phone call from GWRC compliance staff regarding the investigation and site visit to Lake Waiorongomai to view the Southern Drain. After a discussion about the LWRP. Aroha advised the GWRC staff member that she would contact kaitiaki immediately, ensure a karakia was conducted for the 2 officers and that they were accompanied during their visit.	Identify – Fence 2 & 3, Identify 2 – LWRP 1
13/03/14	Aroha called Te Waari regarding the conversation and a plan was made for him to be there the next day.	Identify – Fence 2 & 3, Identify 2 – LWRP 1
14/03/14	GWRC Protection Officers met Te Waari and Aroha at the LWRP car park. Discussion, then hīkoi. GWRC took photos. Investigated all incoming waterways to Lake Waiorongomai. Southern then northern drain. Didn't sample water as Te Waari and Aroha advised they could have access to ecological monitoring data – confidential.	Identify 2 – LWRP 1, Observation – Fence 2 & 3
15/03/14	The KNE Final Draft from GWRC - document is now available for the kaitiaki to review and provide comment. Kaitiaki intend to take to hapū for approval.	Plan – LWRP 2
	KNE Final Report on hold as it has ecological monitoring data from PhD research. Therefore will be released after the PhD Thesis is published. Aroha had korero with GWRC. GWRC Biodiversity Manager agreed.	Disruption of cycle Plan – LWRP 2 HOLD
17/03/14	GWRC Councillors and staff visit Raukawa Marae and Lake Waiorongomai	Observation – LWRP 1
20/03/14	GWRC hīkoi - 2 staff members from Biosecurity viewed and discussed potential eradication and management options for Hornwort. Recommended grass carp.	Hīkoi
	GWRC – pest control officer delivered the DoC 200 predator traps	
	Rangimarkus arrived and started placing and setting the traps around the LWRP Phase 1 fence around the lake.	
	Landscape Architecture students assigned to LW turn up for another site visit. The discuss the project and vision with Aroha again.	
	Te Rito kura visit as well. Hika Pene & fitness class high school students run through the paddocks. Kura initiative.	
21/03/14	Hui with Tanira at Whakatupuranga Rua Mano kura regarding shooting rabbits. Also discussed planned wānanga with Rolly and students.	Plan – Pest 2
31/03/14	Whakatupuranga Rua Mano kura wānanga at the lake, 10am. Fish and insect monitoring.	Action & Observation – Monitor 2 & 3

	Guest speaker Dr Russell Death. Teacher: Tanira Cooper. Assistant Trainee Teacher: Te Waimatao Ropata. Twelve Year 10 and 11 students.	
10-13/04/14	Landross Lewis Harakeke splitting. Preparation for planting. Aroha dropping Landross out to LW and picking up again.	Action – Plants 3
10/04/14	Elaine Bevan and Sonia Snowden hīkoi to Lake Waiorongomai to identify harakeke species and its properties	Action & Observation – Plants 3
12/04/14	Aroha purchased padlock and chain for front gate. Receipts to Rupene. Padlock to Skip.	Plan – Fence 2
12-13/04/14	Whānau planting weekends throughout winter on the second weekend of each month for five months, as suggested by whānau at the February Wānanga. The exception May due to duckshooting season. Harakeke plants on the saturday. Tī Kouka seedlings & seeds.	Action – Plants 2 & Plants 3
15/04/14	KCDC Rob Cross 10am hīkoi to Lake Waiorongomai. Discussed planting plan & locations. Discussed the whānau and hapū decisions on digging and discovery of middens or other historical artefacts. Landross Lewis received a tutorial on the pest trap monitoring.	Plan – Plants 1 & Pest 1
17/04/14	Hui with Te Waari, Rupene and Aroha re: update on LWRP.	Reflection – LWRP 1
18/04/14	Rupene called Aroha to inform her that he had spoken to neighbour David Keelan. He received approval to get water from his bore for Hans. Keelan noted that he would measure the amount and expect a small fee from Hans.	Identify – Troughs 1
22/04/14	Aroha took Whaea Nellie Carkeek to see fence, plants and Lake Waiorongomai.	Observation & Reflection – LWRP 1
28/04/14	Placed the DO meter out in the lake.	Action – Monitor 3
29/04/14	Water and aquatic insect monitoring carried out by Lil and Ursula. With Pukuohurangi and Aroha observing.	Action - Monitor 3
29/04/14	Observed phase 1 fences around Lake Waiorongomai complete. Although two temporary fence areas exist for the culvert sites - the north end of the lake and stream area next to Waiorongomai 1A – Waiorongomai 3B2 border. Gate for eastern fence remains open until troughs are running. Cattle also have temporary access to waterways at both culvert sites.	Reflection – Fence 2, 3 & 4.
30/04/14	DO meter out of lake.	Action – Monitor 3
30/04/14	Hīkoi to lake with Gray Jamieson to investigate the hornwort. Identify aquatic weed species. Identify the factors that would influence the quote on the introduction of grass carp to potentially eradicate Hornwort.	Action – Monitor 5
07/05/14	3 troughs hooked up to the water supply. Troughs confirmed by Skip as running.	Action – Trough 1
08/05/14	Hui with Skip – confirmed Phase 1 Fence complete according to latest plan – except for 2 temporary fencing areas around the 2 proposed culverts.	Reflection – Fence 2, 3 & 4
08/05/14	Hui with Te Waari - confirmed Phase 1 Fence complete according to latest plan. Te Waari reported progress to NHoO.	Reflection – Fence 2, 3 & 4

14-15/06/14	Whānau planting weekend.	Action – Plants 1
22/05/14	Hui Aroha and Rangimarkus 10am regarding Pest Control trapping results.	Observe 1 – Pests 1
23/05/14	Aroha and GWRC Biodiversity Officer Mike Urlich hui re: info to file (KNE). Sent final report.	Identify – LWRP 1
24/05/14	Te Waari and Aroha hui re: update on GWRC and next funding round open soon.	Identify – LWRP 2
25/05/14	Hans visit re: second GRWC letter. Hans was concerned and sought advice. Aroha discussed the options and volunteered to assist him in creating a written formal reply.	Reflection – Fence 2, 3 & 4
	Confirmed that troughs were working but the plastic troughs were less than ideal. Requested the change of material to concrete.	Identify – Troughs 2
26/05/14	Aroha assisted Hans in writing a formal reply. 1pm hui at Lupin rd.	Reflection – Fence 2, 3 & 4
28-29/05/14	MTM RMG Hui. Massey, Cawthron Institute, Waka Digital and Taiao Raukawa. Update on the MTM Regional case study and 6 local case studies including LW.	Reflection – LWRP 1
30/05/14	Hui with Ariana Te Aomarere. Update on LWRP progress.	Reflection – LWRP 1
09/06/14	Michael Urlich, phone call update on LWRP progress and a reminder for NHoO to invoice for pest control funding.	Reflection – LWRP 1 Reflection – Pest 1
07/06/14	Aroha dropped the Harakeke shovel off for sharpening. Noel McBeth sharpened for a koha. Aroha organised koha, receipt. Rupene ensured reimbursement.	Plan – Plants 2
09-10/06/14	Landross Lewis and James Keswick – Harakeke splitting. Aroha driving the lads out to LW and picking them up after mahi. Aroha also organising resources. Karakia for James.	Action – Plants 2
11/06/14	Landross Lewis splitting Harakeke. Aroha transport.	Action – Plants 2
13/06/14	Landross Lewis and James Keswick – Harakeke splitting. Aroha driving the lads out to LW and picking them up after mahi. Aroha also organising resources.	Action – Plants 2
14/06/14	Whānau planting day.	Action – Plants 2
17/06/14	Landscape Architecture student presentations in Wellington at the School of Architecture and Design. All the local MTM case studies were presented which included LW. Each student provided a presentation and discussed their design and inspiration.	Reflection – LWRP 1
24/06/14	Received consent for culverts in the mail. Rupene scanned to keep on record for NHoO and the LWRP.	Plan – Culverts 1
02/07/14	Forest and Bird Society Horowhenua 3 monthly bird monitoring.	Action & Observe – Monitor 4
12-13/-07/	Whānau planting weekend.	Action – Plants 1

14		
15/07/14	Aroha hui with Ōtaki Librarian at 1pm regarding the Landscape Architecture Student exhibition of LW designs.	Plan – LWRP 1
22/07/14	Water and aquatic insect monitoring carried out by Aroha	Action - Monitor 3
4-5/08/14	Landross Lewis splitting Harakeke. Aroha transport.	Action – Plants 2
9-10/08/ 14	Whānau planting weekend.	Action – Plants 1
11/08/14	Landross Lewis splitting Harakeke. Aroha transport.	Action – Plants 2
13-14/08 /14	NZ Marine Science Conference in Nelson, presentation on Shellfish Survey by Emma Newcombe (Cawthron) and Aroha. Results included north and south of Waiorongomai Stream.	Reflection – MTM 1
18/08/14	Landscape Architecture Students set up LW designs in the Ōtaki Library. Brought to Ōtaki so the whānau and hapū of LW had easy access to view the designs. Reciprocity.	Reflection – LWRP 1
18/08-06/09/14	Landscape Architecture Students LWRP designs exhibition continues for 3 weeks. A lot of great feedback from the community provided to the librarian. Local kura visit to see the designs.	Reflection – LWRP 1
13/09/14	Whānau planting day.	Action – Plants 1
	Whānau planting weekends – it was noted & discussed with kaitiaki that Saturdays had a much greater turn out than Sundays.	Reflection – Plants 1
19/09/14	Roy Winterburn and Jeremy (Skip) Skipper removed the old collapsed 300mm diameter culvert from the Waiorongomai Stream.	Action – Culvert 1
	These two contractors then placed the first plastic culvert into the stream. Packed it with the nearby sand and dirt. The culvert appeared to buckle on entry. To ensure Kathy Simcox (Farmer and leasee of Waiorongomai 1A) could drive a tractor over the culvert the contractors drove over the culvert which buckled it further. Decision unsuitable material.	Observation & Reflection – Culvert 1 <u>Disruption</u> to cycle
	They noted however that the stream flow had improved and was not hindered in any way in its current state. Roy contacted Kathy to inform her that the culvert was only suitable for a four wheel motorbike and cattle to cross but not a tractor in the interim.	Identify – Culvert 1
22/09/14	The contractors met with Aroha Spinks to inform her of the situation and to suggest a change in material.	Reflection – Culvert 1 Identify 2 – Culvert 1
	Aroha contacted Rupene Waaka to update him of the situation.	Identify 2 – Culvert 1
	On approval she then rang and emailed Simon Hunt at GRWC the contact person within the Consent Applications Department to inform him and request approval to change the diameter and material to the proposed 600mm diameter concrete culverts.	Plan 2 – Culvert 1
24/09/14	Hīkoi over Waiorongomai 1A to plan the proposed restoration fence along the stream to sea. Nick Albert (Trustee Waiorongomai 1A), Aroha & Moira Poutama (Taiao Raukawa), Rangimarkus Heke (Ngā Whenua Rāhui), Kathy	Plan 1 – Fence 6

	Simcox (Leasee on Waiorongomai 1A), Hayden (Farm assistant), Skip. Rangimarkus GPS locations of the proposed fence.	
	Simon emailed approval for the change in culvert size and material	Plan 2 – Culvert 1
25/09/14	Aroha Lake Waiorongomai Restoration Project presentation to Waikato-Tainui at Ngaruawahia. Approved by Rupene Waaka because of the scholarships Aroha received to support her studies. Seen as reciprocity and giving back.	Reflection – LWRP 1
26/09/14	Aroha and Landross helped to move the 200 plants into the nursery.	Action 2 – Plants 1
26/09 – 01/10/14	TWoR Te Puna nursery used to hold the 200 donated native trees, approved by Caleb Royal.	Plan & Action 2 – Plants 1
01/10/14	Rolly, Huhana, Moira, Skip, Pikitia, Aroha and two passionate TWoR Pūtaiao students attended the spontaneous planting day in October to assist with the 200 donated native trees. One first year student Terina Hamilton (Ngāti Porou, and Ngāti Kapu) and one fourth year student – Hami of Rotorua Iwi descent.	Action 2 – Plants 1
01/10/14	Roy purchased the new concrete culverts and hired the digger. The first concrete culvert was placed into the stream. The contractors decided to sandbag around the culvert to prevent erosion.	Action & Observation 2 – Culvert 1
02/10/14	Hui at Raukawa Marae, 2pm. Presentation on MTM Shellfish survey results and also Phil Ross (Waikato University) about Toheroa.	Reflection – MTM 1
07/10/14	The second concrete culvert was placed in the northern drain by Roy and assisted by Skip.	Action & Observation 2 – Culvert 1
09/10/14	Skip began the restoration fencing around the two culvert areas to replace the temporary fences. Starting with the stream fences first.	Action 2 – Fence 3 & Fence 4
13/10/14	Rob and Aroha LW hīkoi – check plants, plan 2015. 3 spoonbills	Action & Reflection – LWRP 1
19/10/14	Aroha had a discussion with Hans re: grazing his cattle within the restoration area. Access to the north western side of the lake edge was being obtained through the temporary fenced area.	Observe 2 – Fence 3 & Fence 4
20/10/14	Hans apologised and promised to keep the cattle out.	Reflection 2 – Fence 3 & Fence 4
	Aroha informed Rupene. Aroha spoke to Skip about the situation and the importance of completing these fences in a timely fashion.	Reflection 2 – Fence 3 & Fence 4
20/10/14	Received the Waiorongomai GIS maps from Rangimarkus that showed the proposed Waiorongomai Stream fence	Observation – Fence 6
22/10/14	Water and aquatic insect monitoring carried out by Aroha	Action - Monitor 3
	Hui with Roimata and Janie re: Te Rito potential involvement in the restoration project, 12.30. They then took the	Identify – LWRP 1

	kaupapa to kura whānau hui to approve.	
24/10/14	Email sent to Nick Albert with the GIS map of Waiorongomai 10 and Waiorongomai 1A showing the proposed fence line as agreed on the Hīkoi he attended on 24/9. Recommended he forward the map to the Maori Land Court Trustee for Waiorongomai 1A to keep that Trustee informed of developments. Which he agreed to. Nick emailed the Maori Land Court Trustee and copied Aroha in on the email.	Plan – Fence 6
28/10/14	Te Rito kura korero in class, excursion cancelled due to teacher Rolly Raureti being sick. Ten Year 8 and 9 students. Aroha introduced the Lake Waiorongomai Restoration Project and her PhD incorporating Matauranga Maori, Ecology and Environmental Management. Guest speaker Michael Urlich, described the role of GWRC, the GWRC departments and their roles in this restoration project, KNE's, his job as a biodiversity officer, how science is included in his mahi, as well as the positives of outdoor aspects.	Reflection - LWRP
	TWoR Pūtaiao first year student, Lisa Keen – Ngāti Raukawa, gained more experience accompanying Aroha in a fish monitoring exercise to retrieve the nets set for the cancelled Te Rito excursion.	Hīkoi 2 – Monitor 2
04/11/14	Hui with Tipi Bevan (Waiorongomai 1A Trustee) to seek approval for the proposed fence line. Provided Tipi with a copy of the GIS map. Tipi signed and approved the proposed fence line on a copy of the map.	Plan – Fence 6
05/11/14	Hui with Kathy to inform and show her the GIS map now approved by both 1A Trustees and to seek her written confirmation of removing the old fence as a contribution to the project. Kathy approved and signed a copy of the map along with a declaration of her intent and kept a copy.	Plan – Fence 6
07/11/14	Te Rito kura wānanga day at the lake. Trapping demo by Landross Lewis, sighted baby ferret in a trap, sighted the fencing around the northern drain, korero by kuia Queenie Rikihana providing her historical narrative of the area and memories as a child visiting the lake to collect kai for the whānau in Otaki, harakeke planting, fish net retrievals then fish ID and counting species.	Reflection – LWRP & Pest 1 Action – Plants 1 Action & Observe – Monitor 2
10/11/14	Update hui with Rupene provided copies of Tipi and Kathy's signed maps.	Plan – Fence 6
11/11/14	The two fencing areas around the two culverts completed now excluding cattle completely from the lake. Phone call from Skip. Phase 1 fence completed and locked. Hui Aroha provided with keys.	Reflection – Fence 3 & 4
	Left a set of both southern gate keys in Rupene's letterbox along with the final fence invoice from Skip.	Cycle COMPLETION
11/11/14	GWRC members visit to the lake and southern drain to inspect the fencing and waterways. 11am.	Reflection – Fence 5
	GWRC invited Rupene, Te Waari and Aroha, as well as neighbours David Keelan and Hans Somers. David Keelan attended spoke to GWRC Land Management Officer (Jaimie Peryer) and GWRC Compliance Officer (Naomi Watts), GWRC Biodiversity (Michael Urlich). GWRC Land Management Officer volunteered to assist with farm plans for farmers and offered funding assistance for fencing further wetlands.	Identify 2 – Fence 5

	Result they closed the investigation.	Reflection – Fence 5 Cycle COMPLETION
12/11/14	Photos of before, during and after activity were sent by Aroha to Simon by email - the final requirement of the Consent Approval.	Reflection 2 – Culvert 1 Cycle COMPLETED
13/11/14	Set fish traps with Landross for fish monitoring.	Action – Monitor 1
14/11/14	Checked fish traps, counted fish and eels.	Action & Observation – Monitor 1
	Kathy and Hayden removed the old Waiorongomai 1A fencing the straddled the stream. They contributed this in-kind cost to the project as beneficiaries of the funding.	Action – Fence 6
21/11/14	The restoration fence for Waiorongomai Stream started by Skip.	Action – Fence 6
28/11/14	GWRC phone call from Michael Urlich informs me that Kahuwera fencing was complete. Tony Fawlkner had worked with David Keelan on a Farm Plan as well.	Reflection – Fence 7
07/12/14	Discussed with Rupene and Pat Hakaraia, shooting rabbits and Pats idea of solar lights attracting insects for eels. Inspired by a documentary. A whānau initiative.	Identify – LWRP 1
08/12/14	Hui and discussion with Horima Carkeek, re: interview process and the intention. Plan to conduct interview on the 11/12/14.	Plan – Monitor 6
09/12/14	Landross clearing the Parsnip Weed at Waiorongomai Stream mouth	Action – Weed 1
11/12/14	Interview with Horima Carkeek with Moira Poutama and Aroha, included references to kakahi collection in the past. Lupin Rd, Otaki 11am	Action & Reflection – LWRP 1
	Horima was going to visit the lake with his brother over summer to check if any were still present.	Plan 2 – Monitor 6
12/12/14	Skip informed Aroha that the Phase 2 fence had reached the sea boundary.	Reflection – Fence 6
07/01/15	Forest and Bird Society Horowhenua 3 monthly bird monitoring.	Action & Observe – Monitor 4
18/01/15	Final plant inventory of the remaining restoration area by Tim Park and Pat Enright completed.	Action & Observe – Monitor 5
18/01/15	Skip informed that the gates had been ordered and that he had spoken to Kathy (Leasee) about hooking up the electric fence soon.	Reflection – Fence 2
28/01/15	Water and aquatic insect monitoring carried out by Aroha	Action - Monitor 3
30/1/15	Skip informed that the Phase 2 fence complete along the Waiorongomai Stream – but gates to go in and electric wire to liven.	Reflection – Fence 6
05/02/15	Hui with Skip. Electric wire for Kathy's Western Fence hooked up and functional. Restoration fence for	Action – Fence 6

	Waiorongomai Block 10 and gates complete with locks. Received keys. Dropped a set off to Rupene.	Cycle COMPLETION
05/02/15	Baseline ecological monitoring and milestone complete.	Reflection – Monitor 1- 6 CYCLE COMPLETE
10/02/15	WRM tono for redundant water tank to store water for plants in their mara and riparian planting along their stream (a new project for 2015). Plastic culverts also requested for housing baby pigs. Rupene approved this action to support the kura and their involvement in supporting the restoration project.	Identify – Troughs 1 Tikanga
	Aroha informed Skip to organise these resources to be delivered to the kura.	Plan – Troughs 1
19/02/15	Hīkoi with Rob Cross, Michael Urlich, Huhana Smith 11am. Observed phase 2 fence complete, checked plants, traps, weeds etc	Reflection – Fence 6
28/02/15	Final report to GWRC that Phase 2 of LWRP complete	Reflection – LWRP 2
	Whānau are reporting hīkoi to the lake taking other out of town whānau to see the restoration project and their taonga.	Reflection - Hīkoi

Appendix 14 Water quality results at each site

Date	Sample Site	Total P g/m^3	Total N g/m^3	Ecoli MPN/ 100mL	Chl a g/m3
26/03/2013	1	1.5	4.2	2200	
30/04/2013	1	0.29	2.1	210	
21/07/2013	1	1.1	0.09	230	
29/10/2013	1	0.141	0.84	45	<0.008
28/01/2014	1	0.1	1.4	360	<0.004
29/04/2014	1	0.39	2	3900	<0.005
22/07/2014	1	0.21	1	31	<0.003
22/10/2014	1	0.07	0.74	74	<0.003
28/01/2015	1	0.65	8.7	2600000	0.08
26/03/2013	2	1.4	1.8	52	
30/04/2013	2	0.54	1.1	520	
21/07/2013	2	2.3	0.56	150	
29/10/2013	2	0.25	1.68	1	0.099
28/01/2014	2	0.49	1.1	300	0.014
29/04/2014	2	0.23	0.96	1600	0.011
22/07/2014	2	0.19	1.1	41	0.017
22/10/2014	2	0.22	0.79	140	0.015
28/01/2015	2	0.45	0.72	1	0.048
26/03/2013	3	1.6	3	160	
30/04/2013	3	1	1.8	150	
21/07/2013	3	1.2	0.19	<10	
29/10/2013	3	1.26	3.7	300	<0.008
28/01/2014	3	0.37	1.1	110	0.019
29/04/2014	3	0.23	1	930	0.006
22/07/2014	3	0.15	0.83	20	0.012
22/10/2014	3	0.06	0.72	<10	0.133
28/01/2015	3	2.3	4.5	97	0.54
26/03/2013	4	0.3	1.7	1300	
30/04/2013	4	0.13	1.1	290	
21/07/2013	4	1.6	0.19	130	
29/10/2013	4	0.33	1.3	170	<0.015
28/01/2014	4	0.13	8.1	160000	<0.015
29/04/2014	4	0.22	2.2	4400	<0.004
22/07/2014	4	0.11	1.1	30	<0.003
22/10/2014	4	0.06	0.64	520	<0.003

28/01/2015	4	0.05	0.72	25000	<0.004
26/03/2013	5	0.81	1.6	8000	
30/04/2013	5	0.47	1.1	280	
21/07/2013	5	0.19	1.2	930	
29/10/2013	5	0.24	1.09	20	<0.008
28/01/2014	5	0.38	0.95	680	<0.015
29/04/2014	5	0.16	1.4	6100	0.027
22/07/2014	5	0.5	1.8	1900	0.03
22/10/2014	5	0.19	1.1	860	0.004
28/01/2015	5	0.92	0.61	210	0.005

Appendix 15 Summary of LWRP water quality average baseline results 2013-5

Date	Time HR	Water Temp ^{o}C	Total P g/m^3	Total N g/m^3	DO ppm	Secchi M	Ecoli MPN/ 100mL	Chloro-phyll a	Salt (ppt)	Conduct-ivity (uS)	Comments
26/03/13	1040	20.4	1.12	2.46		0.8	2342.4				Shallow. Clear water.
30/04/13	1240	19.6	0.486	1.44	9.32	0.8	290				Recent rain events.
21/07/13	1115	13.7	0.244	1.48	8.31	0.61	289				Overcast.
29/10/13	1220	18.7	0.444	1.72	10.85	0.77	107.2	0.0276	0.2	431.25	Clear water. Fine day.
28/01/14	1220	20.2	0.284	2.53	12.27	0.8	32290	0.099	0.2	434.6	Sunny day. Clear water.
29/04/14	1210	13.9	0.246	1.512	10.99	0.24	3386	0.0104	0.3	438.0	Overcast slight drizzle. Recent rain event.
22/07/14	1145	8.0	0.232	1.166	10.48	0.32	404.4	0.0126	0.2	474.6	Overcast. Steady drizzle.
22/10/14	1130	13.2	0.12	0.798	8.18	0.8	318.8	0.031	0.2	476.1	Sunny day.
28/01/15	1125	19.5	0.874	3.05	9.04	0.8	525061.6	0.1352	0.2	478.0	Very hot day. Dry summer. Cattle recently in drain Block3A, site 1, very high e.coli.

Appendix 16 Dissolved oxygen 24 hour results

Date	28-29/ 04/2013	22-23/ 07/2013	30-31/ 10/2013	29-30/ 01/2014	28-29/ 04/2014	18-19/ 07/2014	6-7/ 11/2014	4-5/ 2/2015
Time	**DO ppm**	**DO ppm**	**DO ppm**	**DO ppm**	**DO ppm**	**DO ppm**	**DO ppm**	**DO ppm**
12:00p.m.	8.73	8.11	11.30	16.70	9.79	12.46	10.03	10.75
12:15p.m.	8.92	8.35	11.40	16.60	10.00	12.48	10.35	10.95
12:30p.m.	9.05	8.49	11.90	16.20	10.20	12.45	10.66	11.40
12:45p.m.	9.22	8.67	12.20	17.30	10.30	12.40	10.51	11.39
1:00 p.m.	9.37	8.97	12.00	18.20	10.60	12.33	10.20	11.93
1:15 p.m.	9.57	9.16	12.00	18.40	10.80	12.32	10.65	11.86
1:30 p.m.	9.72	9.33	12.50	20.40	11.00	12.24	11.52	12.08
1:45 p.m.	9.86	9.44	13.00	20.70	11.30	12.24	10.45	12.40
2:00 p.m.	10.00	9.61	13.20	22.20	11.40	12.16	10.18	12.82
2:15 p.m.	10.18	9.69	13.40	25.00	11.50	12.12	11.33	12.80
2:30 p.m.	10.38	9.76	13.40	24.50	11.70	12.08	11.30	12.85
2:45 p.m.	10.56	9.92	12.80	25.10	11.90	11.98	11.50	13.29
3:00 p.m.	10.79	9.99	13.10	25.70	12.00	11.91	11.95	13.15
3:15 p.m.	10.88	10.00	13.30	26.30	12.10	11.84	12.00	13.42
3:30 p.m.	10.96	10.10	13.50	26.90	12.20	11.80	11.35	13.33
3:45 p.m.	11.01	10.10	13.30	27.40	12.30	11.72	12.19	13.61
4:00 p.m.	11.13	10.20	13.00	25.00	12.30	11.69	11.80	13.55
4:15 p.m.	11.21	10.20	12.70	23.30	12.30	11.64	9.76	13.37
4:30 p.m.	11.29	10.20	12.70	23.90	12.10	11.56	8.98	13.23
4:45 p.m.	11.27	10.20	12.70	25.70	12.10	11.56	9.45	13.14
5:00 p.m.	11.25	10.20	12.80	26.00	11.80	11.48	17.76	13.24
5:15 p.m.	11.23	9.99	12.50	25.80	11.80	11.44	12.64	13.30
5:30 p.m.	11.19	9.96	12.50	25.10	11.60	11.50	12.12	13.22
5:45 p.m.	11.12	9.77	12.10	25.20	11.50	11.46	6.30	12.99
6:00 p.m.	11.13	9.71	12.00	25.80	11.50	11.43	20.70	13.28
6:15 p.m.	11.07	9.63	12.00	24.80	11.30	11.44	14.01	13.47
6:30 p.m.	10.97	9.56	12.40	24.00	11.20	11.39	10.65	13.44
6:45 p.m.	10.91	9.51	13.10	22.20	11.00	11.40	10.53	13.19
7:00 p.m.	10.82	9.37	13.10	20.80	11.00	11.39	10.55	13.03
7:15 p.m.	10.72	9.25	12.90	19.80	10.80	11.37	10.15	12.80
7:30 p.m.	10.73	9.16	12.60	19.30	10.60	11.38	9.80	12.30
7:45 p.m.	10.61	9.17	12.60	19.70	10.50	11.31	9.59	11.81
8:00 p.m.	10.54	9.08	12.30	19.30	10.40	11.34	9.42	11.24
8:15 p.m.	10.43	9.03	11.90	18.70	10.30	11.33	9.28	10.78
8:30 p.m.	10.39	8.97	11.70	18.70	10.20	11.29	9.03	10.41
8:45 p.m.	10.32	8.68	11.50	16.90	10.10	11.31	8.84	10.10
9:00 p.m.	10.21	7.90	11.90	15.60	10.10	11.28	8.63	9.77
9:15 p.m.	10.13	8.16	11.80	14.80	9.99	11.31	8.58	9.48

9:30 p.m.	10.12	8.29	11.70	14.80	10.00	11.29	8.38	9.25
9:45 p.m.	10.11	8.25	11.90	15.00	9.97	11.33	8.13	8.98
10:00p.m.	9.97	8.21	11.90	15.10	9.97	11.31	8.09	8.74
10:15p.m.	9.83	7.95	11.80	14.60	9.95	11.30	8.30	8.53
10:30p.m.	9.78	8.12	11.70	14.50	9.94	11.39	8.03	8.23
10:45p.m.	9.72	8.32	11.60	14.40	9.94	11.37	7.94	8.09
11:00p.m.	9.64	8.10	11.40	14.30	9.97	11.43	7.57	7.88
11:15p.m.	9.57	8.29	11.20	14.60	9.93	11.40	7.04	7.70
11:30p.m.	9.47	8.27	11.10	14.40	9.94	11.43	6.70	7.52
11:45p.m.	9.36	8.30	10.90	14.00	10.00	11.47	6.90	7.26
12:00a.m.	9.16	8.28	10.60	13.80	10.00	11.48	6.81	6.84
12:15a.m.	9.05	8.05	10.30	13.60	9.98	11.52	7.29	6.69
12:30a.m.	8.96	8.06	10.20	13.20	9.91	11.54	7.10	6.61
12:45a.m.	8.97	8.14	10.20	12.50	9.90	11.53	6.86	6.51
1:00 a.m.	8.88	8.11	10.00	11.00	9.78	11.56	6.82	6.29
1:15 a.m.	8.79	7.99	9.99	10.50	9.69	11.58	6.68	6.22
1:30 a.m.	8.65	7.88	9.96	10.30	9.60	11.60	6.61	6.06
1:45 a.m.	8.62	7.86	9.98	10.70	9.50	11.67	6.46	5.97
2:00 a.m.	8.57	7.78	9.82	10.70	9.50	11.72	6.43	6.02
2:15 a.m.	8.56	7.76	9.66	10.80	9.45	11.70	6.22	5.89
2:30 a.m.	8.40	7.77	9.49	10.70	9.34	11.71	5.59	5.93
2:45 a.m.	8.37	7.78	9.36	10.40	9.30	11.75	5.37	5.71
3:00 a.m.	8.31	7.82	9.22	10.20	9.26	11.81	5.28	5.78
3:15 a.m.	8.29	7.70	9.23	10.10	9.15	11.80	5.56	5.79
3:30 a.m.	8.22	7.66	9.08	9.76	9.05	11.84	5.75	5.73
3:45 a.m.	8.12	7.57	8.98	9.40	9.00	11.88	5.85	5.60
4:00 a.m.	7.97	7.47	8.81	9.14	8.95	11.87	5.41	5.48
4:15 a.m.	7.81	7.39	8.68	8.93	8.83	11.89	5.16	5.34
4:30 a.m.	7.51	7.37	8.66	8.76	8.75	11.93	4.94	5.30
4:45 a.m.	7.66	7.41	8.59	8.69	8.75	11.96	4.68	5.09
5:00 a.m.	7.75	7.32	8.49	8.40	8.74	11.97	4.86	5.09
5:15 a.m.	7.79	7.36	8.34	8.18	8.81	11.98	4.98	4.91
5:30 a.m.	7.84	7.26	8.39	8.03	8.53	12.02	5.10	5.16
5:45 a.m.	7.74	7.18	8.16	7.71	8.16	12.05	5.11	5.01
6:00 a.m.	7.69	7.18	8.01	7.25	8.11	12.09	5.02	3.04
6:15 a.m.	7.85	7.10	7.98	6.97	7.96	12.19	4.73	5.00
6:30 a.m.	7.85	7.04	8.01	6.70	7.87	12.19	5.06	5.13
6:45 a.m.	7.79	7.05	7.77	6.47	7.62	12.23	5.31	4.95
7:00 a.m.	7.80	7.01	7.71	6.21	7.68	12.20	5.49	5.29
7:15 a.m.	7.83	7.07	7.71	6.06	7.80	12.25	5.91	5.19
7:30 a.m.	7.85	7.03	7.66	5.82	7.84	12.24	5.74	0.78
7:45 a.m.	7.88	6.95	7.65	5.47	7.84	12.24	5.84	14.94
8:00 a.m.	7.96	6.95	7.58	5.23	7.86	12.24	5.66	3.81
8:15 a.m.	8.01	6.96	7.44	5.07	7.43	12.29	5.45	5.96
8:30 a.m.	8.11	6.96	7.25	4.75	7.51	12.26	5.53	28.19
8:45 a.m.	8.17	6.91	7.14	4.22	7.74	12.26	5.59	7.40
9:00 a.m.	8.30	7.01	7.03	3.59	8.04	12.26	5.84	4.89
9:15 a.m.	8.33	7.01	7.24	3.15	8.26	12.27	6.19	11.75

9:30 a.m.	8.34	7.16	7.28	3.17	8.35	12.22	6.54	8.12
9:45 a.m.	8.36	7.26	7.12	3.51	8.59	12.16	6.83	8.13
10:00a.m.	8.51	7.22	7.14	3.71	8.75	12.13	7.07	9.02
10:15a.m.	8.63	7.18	7.89	3.69	8.84	12.12	7.12	9.85
10:30a.m.	8.70	7.28	7.67	3.53	9.20	12.10	7.31	9.93
10:45a.m.	8.80	7.45	7.59	3.44	9.56	12.06	7.71	9.87
11:00a.m.	8.93	7.66	7.93	3.46	9.87	12.00	8.04	7.86
11:15a.m.	9.08	7.82	8.27	3.25	10.20	11.99	8.00	8.80
11:30a.m.	9.26	7.86	8.39	3.42	10.20	11.96	8.24	9.73
11:45a.m.	9.48	8.01	8.60	4.37	10.20	11.88	8.72	10.16
12:00p.m.	9.40	8.09	8.79	4.43	10.70	11.86	9.10	10.75

Appendix 17 LWRP aged eel samples 2013-2014

Sample reference	**Species** SF-Short fin LF-Long fin	**Length** (mm)	**Weight** (gm)	**Age** (years)	**Gender** F-female M-male or other notes
Mid February 2013					
18	SF	570	371	15	F
19	SF	670	524	23	MIRGRATING F
20	SF	680	665	24	F
21	SF	568	362	14	F
22	SF	507	264	11	M
23	SF	635	462	14	F
24	SF	522	264	8	MIGRATING M
25	SF	533	284	8	F
26	LF	490	241	11	UNDETERMINED
27	SF	480	222	12	F
6 September 2013					
MTM11	LF	800	1340	31	F
MTM12	SF	630	440	18	F
MTM13	SF	590	410	20	M
MTM14	SF	610	570	14	F
MTM15	SF	670	560	19	F
MTM16	SF	660	500	22	F
MTM17	SF	610	480	14	F
MTM18	SF	620	430	17	F
MTM19	SF	580	370	15	F
MTM20	SF	600	410	13	F
4 March 2014					
MTM22	SF	680	530	18	
MTM23	SF	680	568	9	
MTM24	SF	660	542	14	
MTM25	SF	710	707	33	
MTM26	SF	665	528	19	
MTM27	SF	690	658	15	
MTM28	SF	615	505	20	
MTM29	SF	622	448	12	
MTM31	SF	720	513	22	
MTM33	SF	590	387	12	

Appendix 18 LWRP eel samples 15 October 2013

Sample ref.	**Species** SF-Short fin LF-Long fin	**Length** (mm)
1	SF	580
2	SF	630
3	SF	740
4	SF	660
5	SF	670
6	SF	650
7	SF	710
8	SF	690
9	SF	640
10	SF	710
11	SF	540
12	SF	700
13	SF	620
14	SF	800
15	SF	750
16	SF	780
17	SF	720
18	SF	760
19	SF	730
20	SF	730

Appendix 19 LWRP fish counts for size classes results

Date 31/03/14	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Time 11am					
Species					
Common bully <5cm	14	0	4	0	4
Common bully ≥5cm	0	0	0	0	0
Whitebait	0	0	0	0	0
Shortfin eel <20cm	0	0	0	0	0
Shortfin eel ≥20 to <40cm	0	0	0	0	0
Shortfin eel ≥40 to <60cm	0	0	0	1	0
Date 29/10/14	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Time 5pm					
Species					
Common bully <5cm	0	7	0	32	102
Common bully ≥5cm	0	4	0	13	25
Whitebait	0	0	0	0	0
Shortfin eel <20cm	0	0	0	0	3
Shortfin eel ≥20 to <40cm	0	1	0	0	6
Shortfin eel ≥40 to <60cm	0	0	0	0	0
Date 7/11/14	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Time 1pm					
Species					
Common bully <5cm					90
Common bully ≥5cm					35
Whitebait					0
Shortfin eel <20cm					1
Shortfin eel ≥20 to <40cm					2
Shortfin eel ≥40 to <60cm					0
Date 14/10/14	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**
Time 10am					
Species					
Common bully <5cm	20	21	26	96	193
Common bully ≥5cm	5	6	4	9	20
Whitebait	0	0	5	0	0
Shortfin eel <20cm	1	3	4	11	2
Shortfin eel ≥20 to <40cm	6	13	1	9	14
Shortfin eel ≥40 to <60cm	0	0	0	0	0

Appendix 20 LWRP bird monitoring results

Date	**3/08/2013**	**31/01/2014**	**2/04/2014**	**2/07/2014**	**7/01/2015**
Weather	Clear	Fine	Clear	Overcast	Fine
Species (H=heard)				Strong wind	
NZ Dabchick	14	2	10	8	5+
Little Shag	2		2	2	
Black Shag		3	60		
White Faced Heron				1	
Black Swan	50-100	31		34	30
Mute Swan (white)	1	3	1		
Canada Goose	8	24		2	
Goose (domestic)	1				
Mallard	6		4		
Paradise Shelduck		90	5		100+
Duck			11	12	20-50
Grey Teal			10		
Australasian Harrier	2	2	1	1	
Pied Stilt	4				
Pukeko		2			
Spur Winged Plover		3	H	2	
Welcome Swallow	10+	1	2	2	2
Grey Warbler			H		
Blackbird			H		
Fantail	1				
Skylark			1	1	
Goldfinch	1			1	
Caffinch			H		
Tui		1			
Starling		50+	4		
Magpie	1			2	

Appendix 21 Bird observations by kaitiaki

Date	Specie/s	Observer/s	Comments
17/02/2013	Spoonbill, 1 Bittern, 1	Rolly Raureti, Kehu Raureti, Noel Osborne	Saw the Spoonbill in the lake. Heard the bittern. Then saw on the western side by the raupō.
22/04/2013	Bittern, 1	Rolly Raureti, Noel Osborne	Heard the booming of the bird before sighting it. Their thoughts are that this bird spends most of its time at Lake Kahuwera in the raupō there.
28/04/2013	White heron, 1	Aroha Spinks	While placing the Dissolved Oxygen meter in the lake. Observed the bird on the north western side of the lake. A brief visit and it disappeared.
25/08/2013	Pukeko, 1	Rolly Raureti	Observed in paddocks.
15/10/2013	Grey Duck, 3	Noel Osborne	Mother duck protecting two ducklings. Nest observed in the raupō island on the eastern side of the lake.
21/12/2013	White heron, 1	Aroha Spinks, Eila Paul	Seen in flight heading north towards Kahuwera.
20/3/2014	Bittern, 1	Aroha Spinks, Gary Sue (GWRC) (2x GWRC Biosecurity staff)	The bird was flushed out of the raupō on the western side by Rupene's maimai and flew landing to the south.
12/07/2014	Bittern, 1	Aroha Spinks, Barbara Ford	Flushed out of raupō on the western side of the lake just south of outlet stream mouth. Below the bird watching sand dune. Very close.
13/10/2014	Spoonbill, 3	Aroha Spinks, Rob Cross	Circling high above the lake.

Appendix 22 LWRP plant inventory recorded in the summers of 2013-2014

KEY:

h = herbarium specimen lodged

p = planted

x = species seen along the outlet stream and in the beach area

unc = only 1 or 2 specimens seen

? = species id to be confirmed

Botanical name	Maori name	Common name
Gymnosperm trees and shrubs		
None noted		
Monocotyledonous trees and shrubs		
Cordyline australis	ti kouka	cabbage tree
Dicotyledonous trees and shrubs		
Coprosma acerosa (unc fr 31/1/14) x	tarakupenga	sand coprosma
Coprosma repens (unc) x	taupata	taupata
Monocotyledonous lianes		
None recorded		
Dicotyledonous lianes and related trailing plants		
Calystegia sepium var. roseata (f 31/1/14)	pōhue	pink bindweed
Calystegia soldanella (f 31/1/14) x	panahi	shore convolvulus
Muehlenbeckia complexa x	pohuehue	
Tetragonia implexicoma x	kōkohi	N.Z. spinach
Psilopsids, Lycopods and Quillworts		
None recorded		

Ferns		
Azolla rubra	Kārerarera	water fern
Blechnum minus	Kiokio	swamp kiokio
Blechnum novae-zelandiae	Kiokio	kiokio
Dicksonia squarrosa (unc)	Wheki	hard tree fern
Histiopteris incisa	Mātātā	water bracken
Hypolepis ambigua		
Hypolepis distans (unc)		
Pteridium esculentum	Rauaruhe	bracken
Tmesipteris elongata (unc on C. secta base)		fork fern
Tmesipteris tannensis (unc on C. secta base)		fork fern
Orchids		
Microtis unifolia	Māikaika	onion leaved orchid
Grasses		
Austroderia fulvida	Toetoe	toetoe
Lachnagrostis billardierei x	Perehia	sand wind grass
Spinifex sericeus x	Teowhangatara	spinifex
Sedges		
Carex lessoniana	Rautahi	
Carex maorica	Makura	
Carex pumila x		sand sedge
Carex secta	Purei/pukio	
Carex testacea x		
Carex virgate	Pukio	
Cyperus ustulatus	toetoe upoka-tangata	umbrella sedge
Eleocharis acuta	Utuutu	spike sedge
Eleocharis gracilis		slender spike sedge
Ficinia nodosa x	Wiwi	club sedge
Isolepis cernua var. cernua (unc) x		
Isolepis prolifer		
Schoenoplectus tabernaemontani	kapungawha	lake club-rush
Rushes and allied plants		
Apodasmia similis (unc) x	Oioi	oioi
Juncus australis	Wiwi	leafless rush
Juncus caespiticius (unc)		
Juncus edgariae	Wiwi	leafless rush
Juncus pallidus	Wiwi	giant rush
Juncus planifolius		
Juncus sarophorus	Wiwi	leafless rush

Remaining Monocotyledonous plants		
Lemna minor	Kārearea	duckweed
Phormium tenax	Harakeke	swamp flax
Ruppia polycarpa		horse's mane weed
Stuckenia pectinate		fennel leaved pondweed
Triglochin striata		
Typha orientalis	Raupo	bulrush
Daisy-like herbs (Composites)		
Cotula coronopifolia (f 31/1/14)		bachelor's buttons
Euchiton involucratus		cudweed
Leptinella tenella (f 31/1/14) (E1780781 N5491206, E1780908 N5491108)	button daisy	
Dicotyledonous herbs other than Composites		
Centella uniflora		centella
Epilobium billardiereanum (f 31/1/14)		willowherb
Epilobium pallidiflorum (f 31/1/14)	Tarawera	swamp willowherb
Gunnera prorepens (fr 18/1/15)		
Haloragis erecta subsp erecta x	Toatoa	shrubby
Hydrocotyle novae-zelandiae agg.		waxweed
Lobelia anceps (f 31/1/14)	punakuru	shore lobelia
Oxalis rubens (unc (f 31/1/14) x		yellow oxalis
Persicaria decipiens (f 31/1/14)	tutuniwai	swamp willow weed
Potentilla anserinoides	Kōwhai kura	silverweed
Ranunculus amphitrichus (f 18/1/15)	Waioriki	
Ranunculus macropus (unc)	Raoriki	swamp buttercup
Adventives		
Gymnosperm trees and shrubs		
Cupressus macrocarpa (unc) px		macrocarpa
Monocotyledonous trees and shrubs		
Phoenix canariensis (unc) x		phoenix palm
Dicotyledonous trees and shrubs		
Alnus glutinosa (unc) x		alder
Crataegus monogyna (unc) x		hawthorn
Lupinus arboreus		tree lupin
Lycium ferocissimum (f & fr 31/1/14) x		boxthorn
Paraserianthes lophanta (unc s 31/1/14) x		brush wattle
Phytolacca octandra		inkweed

Salix fragilis (unc) x		crack willow
Ulex europaeus x		gorse
Dicotyledonous lianes and related trailing plants		
Rubus ulmifolius (f 18/1/15)		blackberry
Vicia sativa		vetch
Psilopsids, Lycopods and Quillworts		
None seen		
Ferns		
None seen		
Grasses		
Agrostis stolonifera		creeping bent
Alopecurus pratensis (f 18/1/15)		meadow foxtail
Ammophila arenaria x		marram grass
Anthoxanthum odoratum		sweet vernal
Phragmites australis x?		giant reed
Bromus hordeaceus		soft brome
Bromus willdenowii x		prairie grass
Cortaderia selloana		pampas grass
Cynosurus cristatus		crested dog's tail
Dactylis glomerata		cocksfoot
Glyceria declinata		floating sweet grass
Glyceria maxima		reed sweetgrass
Holcus lanatus		Yorkshire fog
Lagurus ovatus x		hares tail grass
Lolium perenne		perennial rye grass
Paspalum dilatatum		paspalum
Paspalum distichum		Mercer grass
Pennisetum clandestinum		kikuyu grass
Phleum pratense (unc)		Timothy
Schedonorus arundinaceus		tall fescue
Sporobolus africanus		African rats tail grass
Vulpia bromoides		vulpia hair grass
Sedges		
Carex ovalis		oval sedge
Cyperus eragrostis		umbrella sedge
Rushes and allied plants		
Juncus acutiflorus (f 18/1/15)		
Juncus acutus (E1780363 N5491641)		sharp rush

Juncus articulates		jointed rush
Juncus bufonius var. bufonius		toad rush
Juncus effusus var. effusus		soft rush
Juncus tenuis subsp. tenuis		track rush
Remaining Monocotyledonous plants		
Agapanthus praecox subsp orientalis (f 31/1/14)		agapanthus
Agave americana (unc)		century plant
Alisma lanceolata (f 31/1/14)		water plantain
Ceratophyllum demersum		hornwort
Crocosmia x crocosmiiflora (f 31/1/14)		monbretia
Potamogeton crispus		curly-leaf pondweed
Sisyrinchium "blue" (f 31/1/14)		blue eyed grass
Zantedeschia aethiopicum x		arum lily
Daisy-like herbs (Composites)		
Achillea millefolium (f 31/1/14)		yarrow
Anthemis cotula (f 18/1/15)		stinking mayweed
Bellis perennis (f 18/1/15)		daisy
Bidens frondosa		beggars ticks
Carduus tenuiflorus (f 31/1/14)		winged thistle
Cirsium arvense (f 31/1/14)		Californian thistle
Conyza sumatrensis		fleabane
Crepis capillaris (f 31/1/14)		smooth hawksbeard
Gamochaeta coarctata (f 31/1/14)		cudweed
Gazania rigins (f 31/1/14) x		gazania
Hypochoeris radicata (f 31/1/14)		cat's ear
Jacobaea vulgaris (f 31/1/14)		ragwort
Osteospermum fruticosum (unc) x		dimorphotheca
Senecio elegans (f 31/1/14) x		groundsel
Sonchus asper (unc f 18/1/15)		prickly sow thistle
Sonchus oleraceus		sow thistle
Dicotyledonous herbs other than Composites		
Amaranthus powellii (unc) x		redroot
Apium nodiflorum (f 31/1/14)		water celery
Cerastium fontanum subsp. vulgare (f 18/1/15)		mouse ear chickweed
Cerastium glomeratum (f 31/1/14)		mouse ear chickweed
Ceratophyllum demersum		hornwort
Chenopodium album		fathen
Erythranthe guttata (f 18/1/15)		monkey musk
Galium palustre (f 31/1/14)		

Geranium molle (f 31/1/14)		dove's foot geranium
Lepidium africanum (f 31/1/14)		pepper cress
Lepidium didymum (s 18/1/15)		twin cress
Linum bienne (s 18/1/15)		pale flax
Lotus pedunculatus (f 31/1/14)		lotus
Lotus suaveolans (f 31/1/14)		hairy lotus
Lythrum hyssopifolia (f 31/1/14)		hyssop loosestrife
Malva neglecta (f 31/1/14 violet form) x		mallow
Modiola caroliniana (f 31/1/14)		creeping mallow
Myosotis laxa subsp. caespitosa (f 31/1/14)		water forget-me-not
Nymphaea alba (f 31/1/14)		common water lily
Orobanche minor		broomrape
Nasturtium officinale (f 31/1/14)		water cress
Parentucellia viscosa (f 31/1/14)		tarweed
Persicaria maculosa (f 31/1/14)		willow weed
Plantago australis		
Plantago lanceolata		narrow leaved plantain
Plantago major		broad leaved plantain
Polycarpon tetraphyllum		allseed
Polygonum aviculare		wireweed
Portulaca oleracea (f 31/1/14) x		purslane
Prunella vulgaris (f 31/1/14)		selfheal
Ranunculus repens (f 31/1/14)		creeping buttercup
Ranunculus scleratus (f 18/1/15)		celery buttercup
Rumex acetosella		sheep sorrel
Rumex conglomeratus		clustered dock
Rumex crispus		curled leaf dock
Rumex obtusifolius		broad leaved dock
Silene gallica (f 31/1/14)		catchfly
Sisymbrium officinale x		hedge mustard
Solanum chenopodioides		velvet nightshade
Solanum nigrum		black nightshade
Stellaria media		chickweed
Trifolium arvense (f 31/1/14)		hares foot clover
Trifolium fragiferum (f 18/1/15)		strawberry clover
Trifolium pratense (f 31/1/14)		red clover
Trifolium repens (f 31/1/14)		white clover
Veronica americana (f 31/1/14) x		water speedwell
Veronica anagallis-arvensis (f 31/1/14) x		water speedwell

Appendix 23 LWRP aquatic plant species April 2014

Aquatic Plant Species	**Native or Exotic**
Ceratophyllum demersum (Hornwort)	Exotic
Potamogeton crispus	Native
Porchreatus	Native
Chara spp	Native
Nitella spp	Native
Azolla	Native
Lemna	Native
Rupia	Native
Typha	Native
Eleocharis	Native
Baumea	Native

Appendix 24 Cultural values associated with Lake Waiorongomai

During the restoration process Ngā Hapū o Ōtaki worked with the GWRC team in 2015 developing the *'Proposed natural resources plan for the Wellington Region'*.[1501] Lake Waiorongomai and the Waiorongomai Stream were identified as sites of significance to Ngā Hapū o Ōtaki. The cultural values listed by whānau and hapū members in Schedule C1 of the 'GWRC Proposed natural resources plan for the Wellington Region' are as follows:

- mahinga kai (a customary gathering place of food and natural materials),
- tānga i te kawa (a place of ritual),
- puna raranga (a weaving material harvesting place),
- puna rongoa (a medicinal plant harvesting place),
- papa kāinga (an original home),
- pā (a fortified village),
- tohu ahurea (a place of instruction and learning),
- wāhi whakawātea (a place where water is used to clear, free or restore spiritual and emotional wellbeing),
- wāhi whakarite (a place that assists in putting things in order).[1502]

Ngā Hapū o Ōtaki also identified Lake Waiorongomai and Waiorongomai Stream as significant precious marine coastal environments in Schedule B: Ngā Taonga Nui a Kiwa[1503]. Refer to the table below for details.

[1501] GWRC, 2015.
[1502] Ibid, p. 292.

Table: Ngā Taonga Nui a Kiwa – Lake Waiorongomai and Waiorongomai Stream

Ngā huanga	Glossary of ngā huanga	Nga huanga o te taonga nui a kiwa
Ngā mahi a ngā tūpuna	The interation of mana whenua with fresh and coastal waters for mana whenua purposes. This includes the cultural and spiritual relationship with water expressed through mana whenua practices. This also includes ancestral connections to the land passed down by tūpuna and whakapapa.	Waiorongomai was a very significant site for our tūpuna, they used this site for very tapu practices (whakawātea, cleansing removal of tapu). They also used the lake to sustain themselves through kai and through spiritual activities. Local testimonies and literature support this.
Te mahi kai	Places where mana whenua manage and collect food and resources and undertake activities to uphold tikanga Māori. This is not only about the bounty collected but the transmission of knowledge through the act of collection.	The Waiorongomai system has a very large capacity to provide food. Local testimonies and literature support this.
Wāhi whakarite	Sites and places where particular practices and activities take place. These are often places that have been used for centuries that require a specific environment. These practices differ from day to day activities outlined above in Ngā Mahi a Ngā Iwi. These include very important and often restricted activities that are undertaken by Māori that have been used for centuries.	A place used for very special spiritual and physical ceremonies. Local testimonies and literature support this.
Te mana o te tangata	Many waterbodies are recognised by their neighbours as being of particular value to not only those that hold rangatiratanga of a water-body but also to those who interact and rely on their neighbours for certain resources. In this case a requirement could be the support or endorsement by another iwi. This would provide an opportunity for whanaungatanga and mutual mana enhancement.	Recognised regionally and possibly nationally for its capacity to support people. A reputation for 'providing' for large events. Kua rangona te marae tenei roto. Local, regional and possibly national testimonies and literature support this.
Te manawaroa o te wai	Some water bodies have sustained intense pollution over a long period of time. In many cases these water bodies are seen as having a level of resilience unseen in other water entities.	Restoration potential is huge. Recent ecology assessments show the presence of essential species. Recent and current studies support this.

[1503] Significant marine areas. Recognising the relationship freshwater bodies such as dune lakes have with the marine environment. "The breath of life (te hā o te ora) exists within our water-bodies. Outstanding waterbodies have an essence within them that provide for wairua and mauri. This hā supports these water-bodies in their ability to provide kai, provide resources and heal the body and spirit." Cited in Ibid, p. 278.

	In the minds of tangata whenua the restoration of many of these water bodies provides an excitement. The potential of particular outstanding water bodies provides a special opportunity for iwi to be able to once again provide their quests with kai-rangatira, relearn practices of the past, and identify themselves with a water-body that will be healthy.	
Te mana o te wai	Some water bodies of our region are inherently connected to our identity and the mana of the area.	Waiorongomai informs the identity of Raukawa ki te Tonga and many hapū of Ōtaki. Local testimonies and literature support this.
Wāhi mahara	Wāhi mahara are places of learning and where local knowledge and histories are etched in the landscape. These are essentially a place that was central to intergenerational knowledge transmission of our tūpuna, and could be used as such again in our future.	A cruicial place to transmit knowledge. Local testimonies and literature and recent educational studies support this.

Appendix 25 Current western science planning models

The dominant planning model in resource and environmental management is known as 'synoptic planning' or 'comprehensive rational planning'.[1504] This synoptic planning model does not cope well with complexity, uncertainty or chaos. Other well-established planning models include 'incremental planning', 'mixed scanning' and 'transactive planning'. Ludblom the chief architect of incremental planning remarked that "because everything is interconnected, the whole of the environmental problem is beyond our capacity to control in one unified policy."[1505] The incremental planning approach did not focus on maximum economic efficiency but replaced it with assuming that participants were searching for satisfactory solutions that were good enough. This approach is based on no single correct solution exists. It acknowledges that the planner does not always know what is needed but is likely to know what should be avoided. By being reactive the plans and policies move systematically away from undesirable situations towards ideal outcomes. Major limitations include the approach does not cope with abrupt radical changes or significantly new innovative practices.[1506] Mixed scanning is a less cautious approach. The planner relies heavily upon a continuous series of incremental decisions and scans a limited range of alternatives.[1507] Transactive planning includes input from those affected by planning decisions. An emphasis is placed on the value of partnerships and incorporating local knowledge into planning.[1508] In conclusion, no planning approach is perfect, every scenario and circumstance is different and none of the traditional models resonated well with a Māori perspective.

[1504] Mitchell, 1977, p. 84.
[1505] Ludblom, C., 1974, Incrementalism and environmentalism, pp. 32-34. Cited in Mitchell, 1977, p. 87.
[1506] Mitchell, 1977, p. 87.
[1507] Ibid, p. 88.
[1508] Ibid, pp. 88-89.

Economics is often the key driver of current environmental planning and policy decisions. Although, I acknowledge and knew the theoretical underpinnings of these resource and environmental approaches, practically speaking none of these planning models would have changed the way in which this local restoration project was carried out.

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