PORIRUA KI MANAWATŪ INLAND WATERWAYS

HISTORICAL REPORT

Te Rangitāwhia Whakatupu Mātauranga Ltd

Helen Potter, Aroha Spinks, Mike Joy, Mahina-ā-rangi Baker,

Moira Poutama, and Derrylea Hardy

A report commissioned by Crown Forestry Rental Trust

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1. INTRODUCTION

1.1 The Research Team and Authorship

For the *Porirua ki Manawatū Inland Waterways – Historical Report*, Te Rangiāwhia Whakatupu Mātauranga Ltd's research team included:

Aroha Spinks who is of Ngāti Raukawa, Ngāti Tūkorehe, Ngāti Wehi Wehi, Ngāti Kapu, Ngāti Toa Rangatira, Ngāti Koriki, and Ngāti Mahuta descent. She holds a Bachelor of Applied Science (Fisheries) First Class Honours from the Australian Maritime College and is currently working towards a PhD in resource and environmental planning at Massey University. Her doctorate research is focused on Lake Waiorongomai and supports the restorative work of those whānau and hapū associated with the lake. Aroha has held a number of research and management roles including for Moana Pacific Fisheries Limited, Sealord Group Limited, Taiao Raukawa Environmental Research Unit, and Kai Consultancy Ltd of which she was a director. Aroha was the research project leader and a contributing author of this report, producing the chapters on title and ownership and on flood control and gravel extraction.

Derrylea Hardy who is an experienced research project manager. She has a cross-disciplinary knowledge base including management, ecological economics, sustainable development, environmental restoration, and cross-cultural research and knowledge uptake. Derrylea was the project manager for the recently completed Deep South National Science Challenge programme, the Adaptation Strategies to Address Climate Change Impacts on Coastal Māori Communities project, and for the Manaaki Taha Moana: Enhancing Coastal Ecosystems for Iwi project. Derrylea was the research project manager of the report and contributed to the chapter sections on gravel extraction.

Mahina-ā-rangi Baker who is of Te Āti Awa o Whakarongotai, Ngāti Raukawa, and Ngāti Toa descent. She holds a Masters in environmental studies from Victoria University of Wellington and is working towards a PhD in resource and environmental planning at Massey University. Mahina-a-rangi is currently an environmental consultant in the field of Māori resource management, particularly in fresh water and river management, and previously worked as a researcher on a project to develop a hua parakore tikanga Māori verification system for maara kai. She was a research assistant on the project and a contributing author of this report, producing the chapter on resource management.

Dr Mike Joy who is a renowned leader in the fields of freshwater biodiversity loss, water pollution, and local government management of freshwaters. He holds a PhD in ecology from Massey University, and is currently a senior lecturer at Massey University's Institute of Agriculture and Environment. Mike is also a member of Landcorp's expert environmental reference group, and helped establish the Centre of Environmental Justice. He was a researcher on the project and a contributing author of this report, producing the chapters on water quality and fisheries and wetlands.

Moira Poutama who is of Ngāti Kikopiri, Ngāti Kapu, Ngāti Tūkorehe, Ngāti Wehi Wehi, and Ngāti Raukawa descent. She holds certificates in kawai raupapa, te reo Māori, and iwi environmental management, and a Diploma in Arataki Manu Korero from Te Wānanga o Aotearoa. Moira has worked on a large number of research projects for Te Rangitāwhia Whakatupuranga Mātauranga Ltd including the Deep South National Science Challenge programme, Adaptation Strategies to Address Climate Change Impacts on Coastal Māori Communities project, and the Manaaki Taha Moana: Enhancing Coastal Ecosystems for Iwi project, and others in waterways and kaimoana restoration. She was a research assistant on the project and also held the role of kaiwhakarite for project hui and wānanga.

Dr Helen Potter who is of Ngāti Maniapoto and Ngāti Raukawa descent. She holds a PhD in sociology from Massey University which examined the prospects for just forms of Treaty relationships between Māori and the Crown. Helen is a former senior researcher at Parliament and at the New Zealand Council for Educational Research, and is the author of a number of reports examining Māori wellbeing in education and health. She is currently a co-director of Tīaho Limited, a kaupapa Māori research, evaluation and policy development company. Helen was a researcher on the project, producing the remaining chapters, and was also the managing author of this report.

1.2 Project Brief

This report was commissioned by the Crown Forestry Rental Trust as part of a wider research programme to support claimants in the Porirua ki Manawatū Inquiry District. The programme includes a number of district overview technical research projects, namely the:

- Block Research Narratives project, the purpose of which is to identify, index, and collate key historical records relating to land blocks in the district;
- Public Works Issues project, which will examine the nature, extent, and impact of all compulsory acquisitions of Māori land in the district;
- Environmental and Natural Resources Issues project, which will examine environmental change in the district since 1840, the impacts of these changes on hapū and iwi, and the Crown's role in the changes. It will also examine the Crown-Māori relationship with respect to the environment and natural resources;
- Local Government Issues project, which will address claims issues relating to local government in the district, including consideration of hapū and iwi engagement in various forms of local government and the impact of rating on Māori land; and
- Inland Waterways Cultural Perspectives project, which considers the customary use and significance of the inland waterways in the district, the impact of European colonisation on this customary use, and the efforts of hapū and iwi to ensure central and local government recognition of the cultural significance of the waterways.

This Inland Waterways Historical report completes the suite of district overview technical research projects. It has been commissioned on behalf of all approved clients and all claimants in the inquiry district, who, collectively, affiliate to:

- All hapū of Ngāti Raukawa ki te Tonga and affiliated groups, including Ngāti Kauwhata, Ngāti Wehi Wehi, Ngāti Tūkorehe, Ngāti Hikitanga/Ngāti Hikitanga Te Paea, Ngā Hapū o Kererū (Ngāti Hinemata, Ngāti Takihiku, and Ngāti Ngārongo), Ngā Hapū o Himatangi (Ngāti Turanga, Ngāti Te Au, and Ngāti Rākau), Ngāti Kapumanawawhiti, Ngāti Te Rangitawhia, Te Mateawa, and others;
- The hapū and iwi of Te Reureu, including Ngāti Pikiahu, Ngāti Parewahawaha, Ngāti Whakatere, Ngāti Matakore, Ngāti Wae, and Ngāti Rangatahi;
- Muaūpoko;
- Te Ātiawa/Ngāti Awa; and
- Hapū and iwi claims from Ngāti Toa, Rangitāne ki Manawatū, Ngāti Hauiti, and others.

Also part of the Porirua ki Manawatū Inquiry District research programme are four historical issues projects for Ngāti Raukawa and affiliated iwi and hapū, and client-specific oral and traditional history projects.

As per the project brief, the two technical reports on inland waterways – this historical report and the cultural perspectives report (forthcoming) – are intended as companion pieces and should be read together.[1] The cultural perspectives report has been largely based on oral history interviews with claimants,[2] while this historical report is largely based on written Crown and local authority records. In line with the intention that the reports accompany one another, this historical report includes references to cultural perspectives where appropriate. The report also includes particular mention of a further six oral history interviews with claimants completed after the cultural perspectives report was in final draft form. The synopses of these interviews are included in Appendix V.

Examined in this report are claims issues relevant to the extensive array of water bodies in the Porirua ki Manawatū Inquiry District, including those which are named in Statements of Claim as well as others. These water bodies include but are not restricted to:

- Turakina River;
- Manawatū River and its tributaries in the district, including the Oroua River and the Pohangina River;
- Awahou Stream;
- Tokomaru Stream / Makarua River;
- Makerua swamp / wetlands;
- Whirokino waterway
- Lake Koputara and the Koputara Stream;
- Hōkio Stream;
- Lake Waiwiri/ Papaitonga and the Waiwiri Stream and wetlands;
- Ōhau River and estuary;

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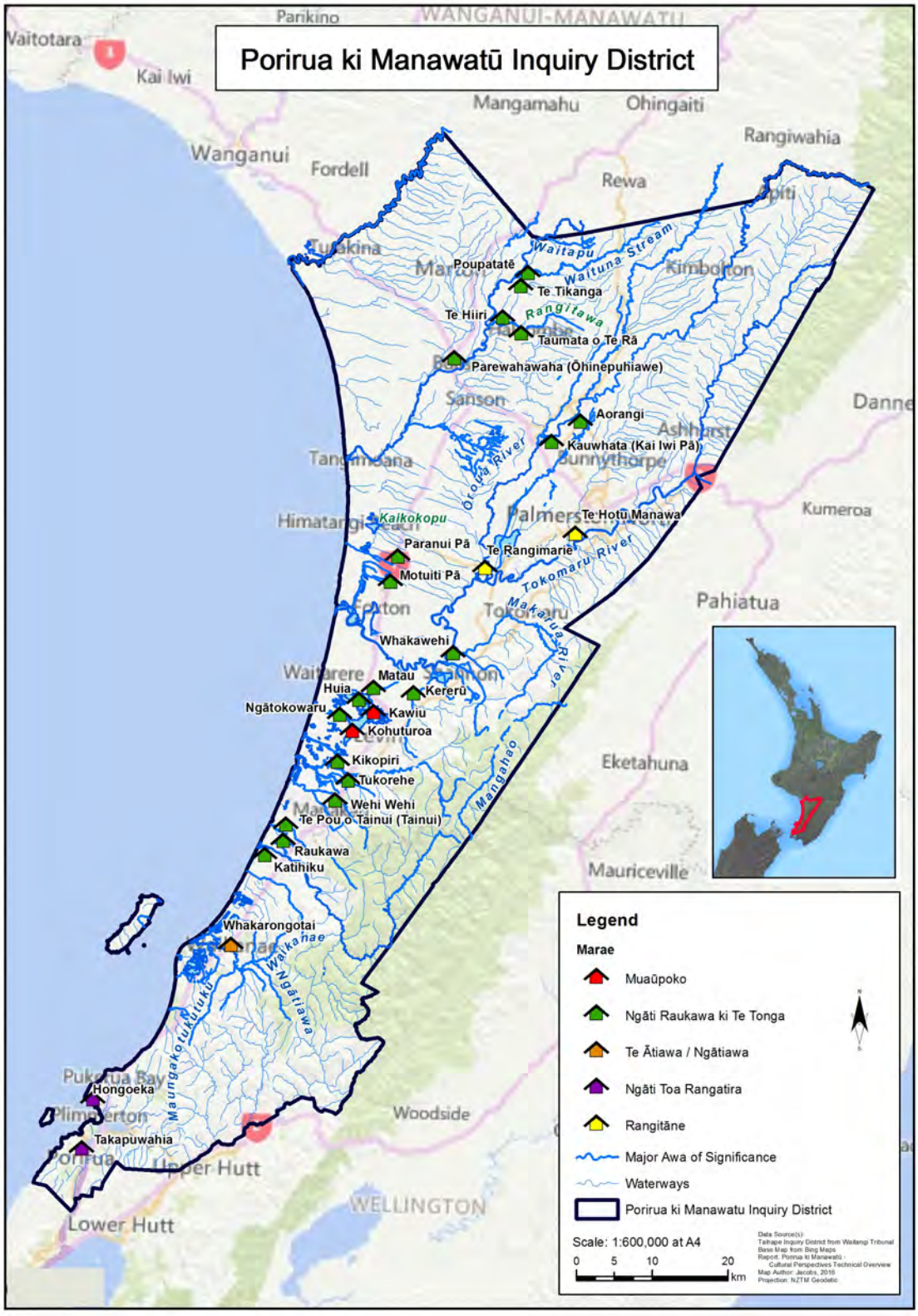
1 H Smith, *Porirua ki Manawatū Inland Waterways Cultural Perspectives Report*, (Wellington: Crown Forestry Rental Trust, forthcoming).

2 M Poutama, A Spinks, and L Raumati, *Porirua ki Manawatū Inquiry: Collation of Oral Narratives for Inland Waterways – Cultural Perspectives Draft Report* (Wellington: Crown Forestry Rental Trust, 2016).

- Waikawa Stream;
- Manakau Stream;
- Waitohu Stream;
- Ōtaki River;
- Kūkūtauākī Stream;
- Waikanae River;
- Ngātiawa River;
- Ngātiawa Spring;
- Wharemauku Stream;
- Whareroa Stream;
- Waiauti / Waiaute Stream;
- Mangahuia Stream;
- Lake Hākari;
- Forest Lakes;
- Lake Waimarie;
- Lake Te Puna a te Ora;
- Lake Waiorongomai and the Waiorongomai Stream;
- Kiwitea Stream;
- Makino Stream[3];
- Taonui Stream;
- Portion of the Akatarawa River that falls within the Inquiry District;
- Kairanga Swamp;
- Rongotea Swamp; and
- Pirikawau Spring.

[3] Note: likely inaccurately recorded historically - known as Mangakino. Personal communication, Dennis Emery, email during the Draft Report feedback stage, 28 June 2017.

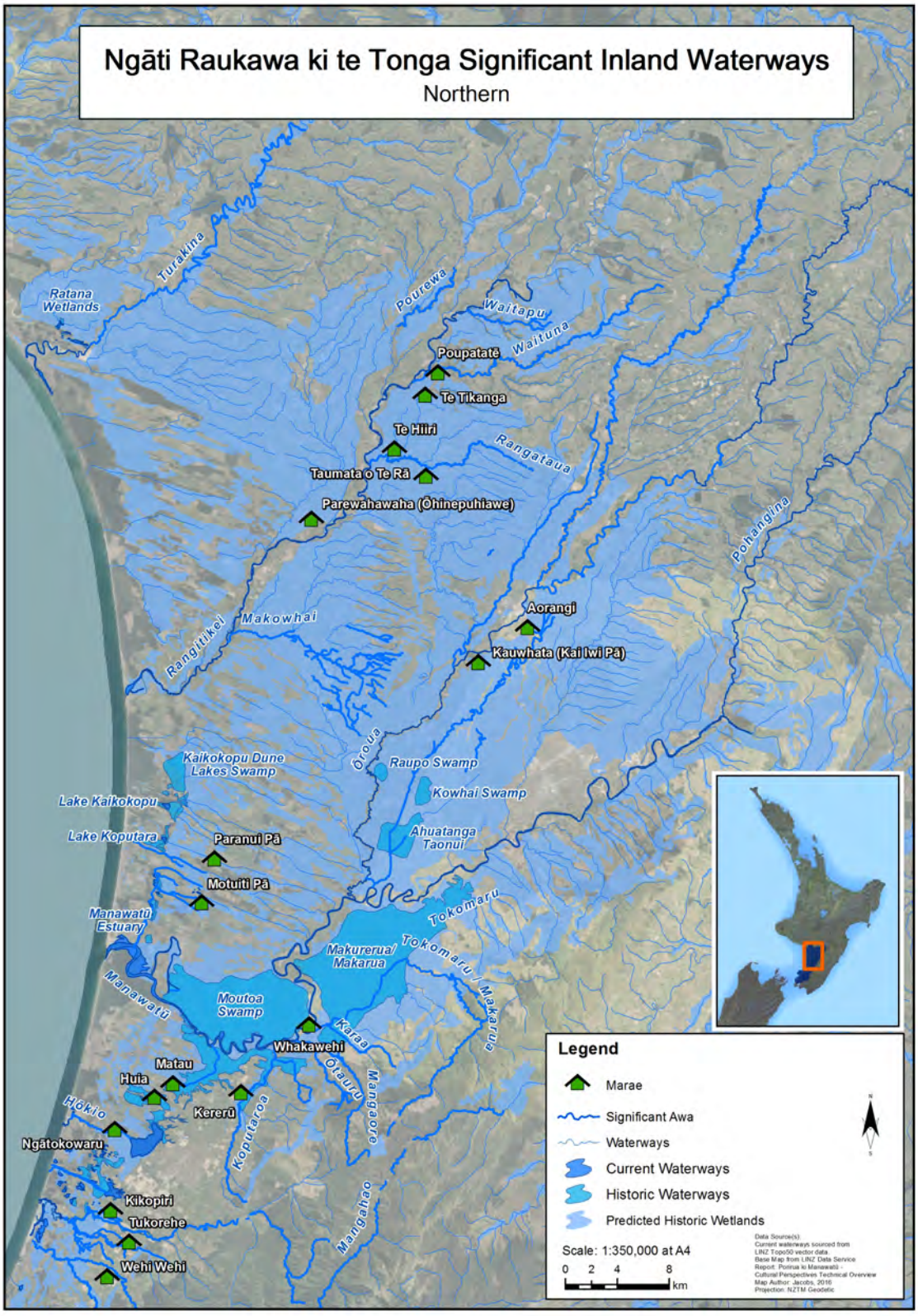


Map 1: **Main Waterways of Significance in the Porirua ki Manawatū Inquiry District.**[4]

[4] Created by Jacobs, courtesy of Crown Forestry Rental Trust.

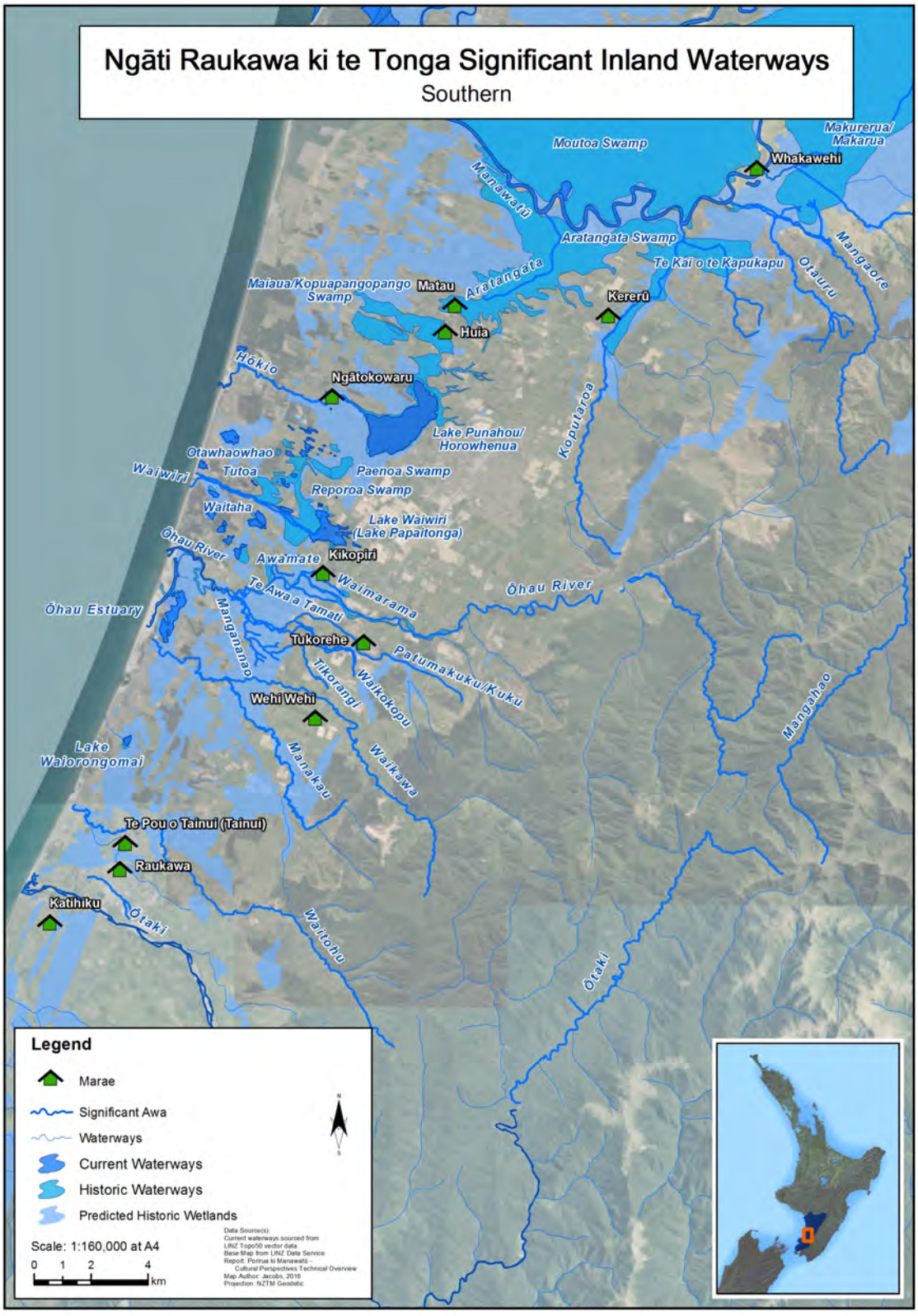
Tables of each of the claimant hapū and iwi and their particular waterways of significance and corresponding cultural values are included as appendices to this report (see Appendices I-IV), and are illustrated in the maps below.[5]

[5] Note: A number of Ngāti Raukawa ki te Tonga hapū are also recognised iwi. Due to the extensive region and the limitations of resources, the significant waterway tables and illustrations along with the associated research required to outline the signficant waterways and associated cultural values specific to Ngāti Wehi Wehi and Ngāti Kauwhata were unable to be produced as requested in the Draft Report feedback stage. Personal Communciation, Daniel Hunt, Senior Solicitor, Rainey Collins, emails representing the views of Wai 1482 and Wai 784 claimants on 16 June 2017.



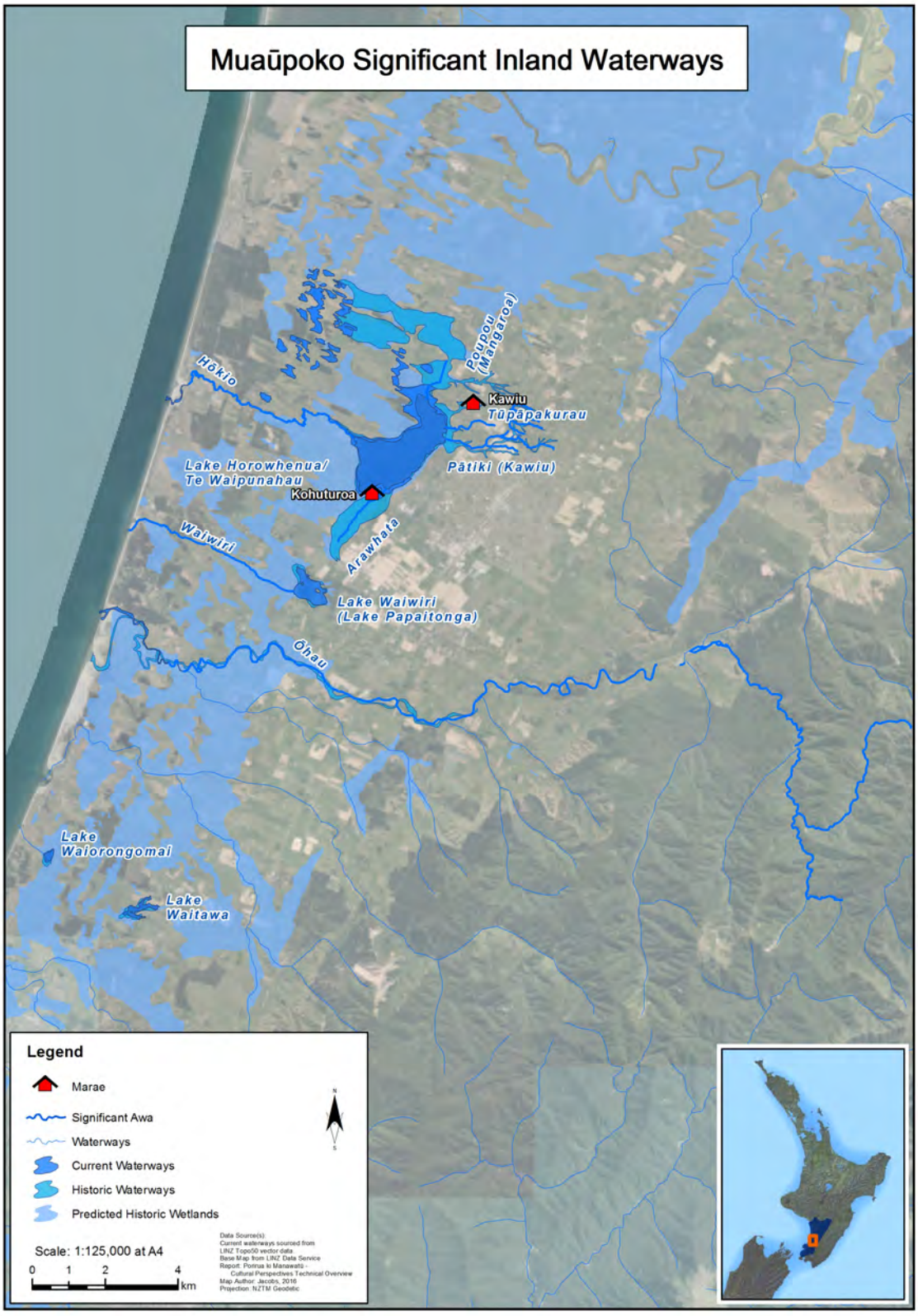
Map 2: **Ngāti Raukawa Inland Waterways of Significance (Northern).**[6]

6 Created by Jacobs, courtesy of Crown Forestry Rental Trust.



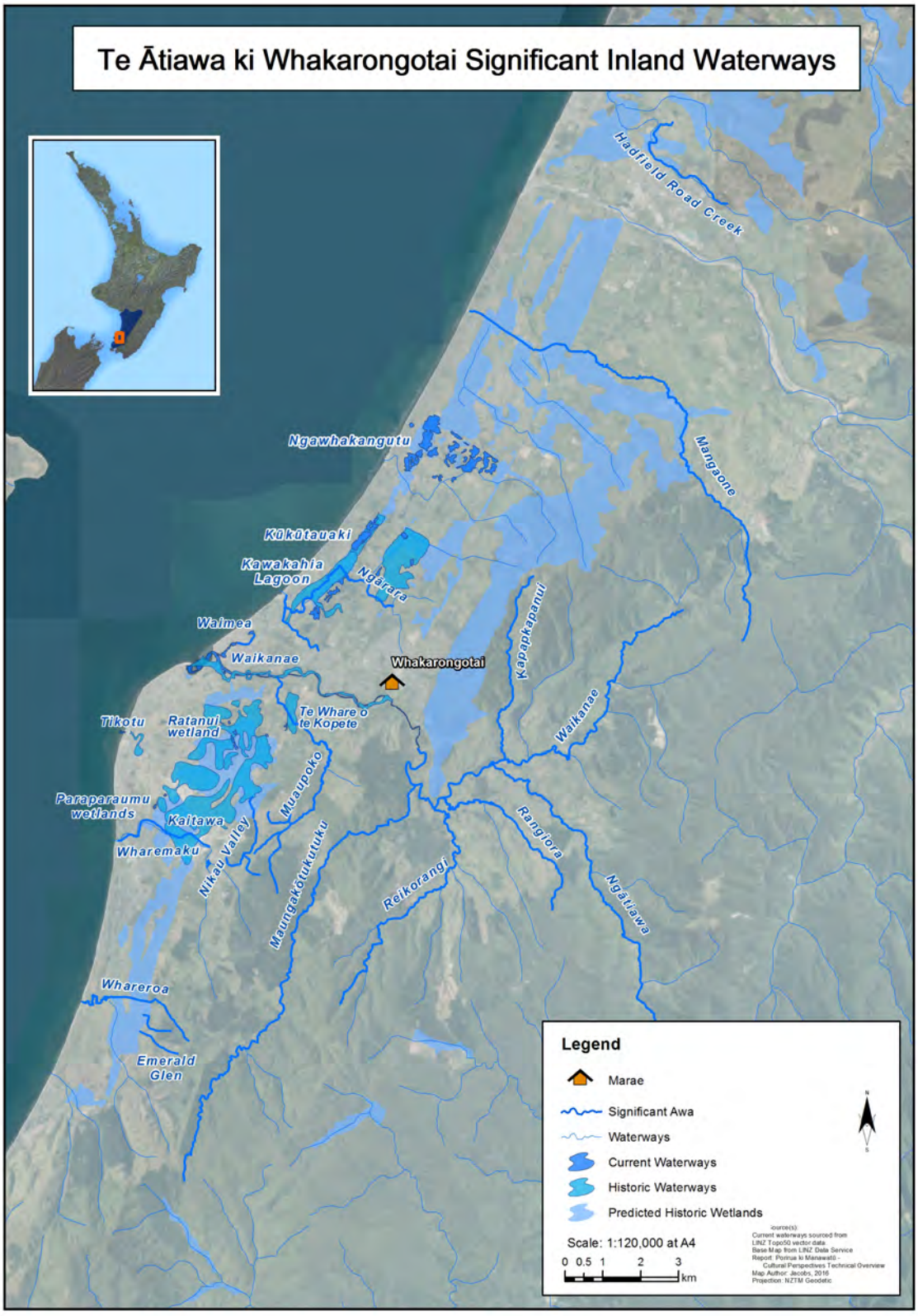
Map 3: **Ngāti Raukawa Inland Waterways of Significance (Southern).**[7]

[7] Ibid.



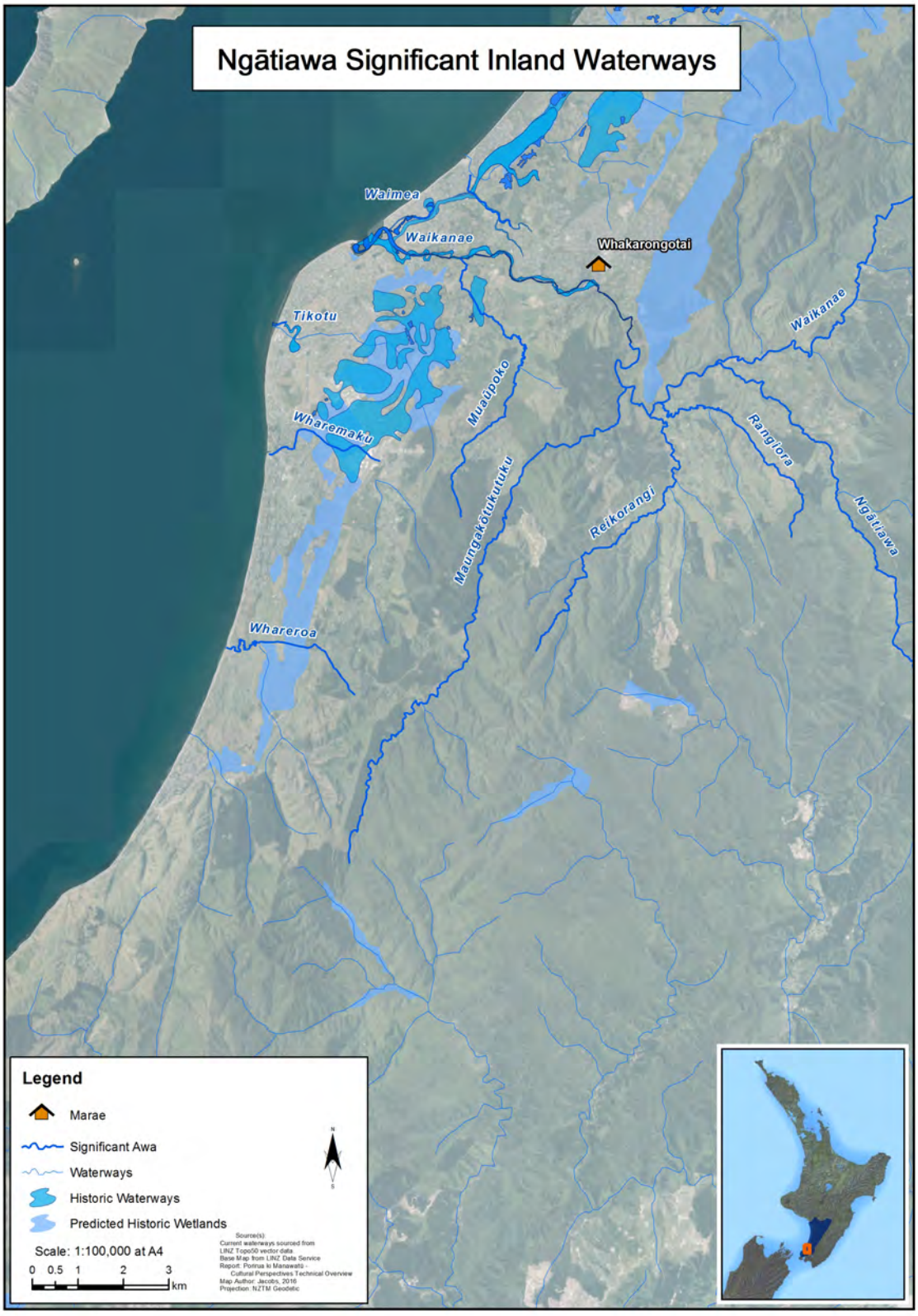
Map 4: **Muaūpoko Inland Waterways of Significance.**[8]

[8] Ibid.



Map 5: **Te Ātiawa ki Whakarongotai Inland Waterways of Significance.**[9]

9 Ibid.



Map 6: **Ngātiawa Inland Waterways of Significance.**[10]

10 Ibid.

Issues related to two significant waterways in the Porirua ki Manawatū Inquiry District have not been included in this report. The first is the Rangitikei River and its tributaries. In accordance with a consensus from claimants, an initial scoping report on the river and two subsequent technical reports (historical issues and cultural perspectives) encompassed the whole of the Rangitikei River from its headwaters to sea.[11] Together, these reports have covered the claims issues for all claimants in both the Taihape and Porirua ki Manawatū inquiry districts. The second is Muaūpoko claims in relation to Lake Horowhenua. A report for Muaūpoko claimants in relation to Lake Horowhenua claims issues for this inquiry district has been commissioned by the Waitangi Tribunal and has already been completed.[12] Accordingly, this report will not duplicate those findings and will instead only examine non-Muaūpoko claims issues in relation to Lake Horowhenua.

Also according to the project brief, this historical report has required consideration of the following themes and issues:

- The customary use and significance of Porirua ki Manawatū inland waterways to hapū and iwi, as perceived and understood by the Crown;
- The impacts of colonisation on Porirua ki Manawatū inland waterways from European settlement of lands, the expansion of the economic and farming frontier, and extractive industries – including such impacts as aggradation, erosion, water quality, wetlands drainage, physical changes in river beds, gravel extraction, and the impacts of any such changes on Māori communities in the district;
- Title, ownership, and legal issues about the district's inland waterways, including application of the *ad medium filum* rule, the impacts of the Coalmines Amendment Act on inland waterways, and ownership issues of the district's lakes and particularly of Lake Horowhenua;
- Water power development and water uses of the district's inland waterways, such as the abstraction of water for township, rural, and industrial water supplies - and including water-take for irrigation schemes;

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11 D Alexander, *Rangitikei River and its Tributaries Historical Report*, Wai 2180 document #A187, November 2015; and P Meredith, R Joseph, with L Gifford, *Rangitikei River and its Tributaries Cultural Perspectives Report*, (Wellington: Crown Forestry Rental Trust, 2016).

12 P Hamer, *'A Tangled Skein': Lake Horowhenua, Muaūpoko, and the Crown, 1898-2000*, Wai 2200 document #A150, June 2015.

- Resource management issues, including the management and control of the district's inland waterways by successive local authorities, the impacts of such management, and the involvement of hapū and iwi in it – including the recognition, if any, of Māori environmental cultural practices involving the district's inland waterways;
- Flood control and protection works, and their impact on Māori landowners and hapū and iwi;
- Fisheries and Crown management of indigenous fish species and indigenous wildlife whose habitat includes the district's inland waterways, and the impact of acclimatization activities and the introduction and management of exotic fish species – including hapū and iwi consultation and involvement with such species;
- Water quality issues, including the trends in the health and condition of the district's inland waterways, their current status, and the ways in which hapū and iwi concerns about water quality and pollution have been raised and responded to by the Crown and local authorities;
- Gravel extraction, including its intersection with inland waterways ownership issues, the application of royalty regimes, and the relationship between gravel extraction and flood control; and
- Any issues relating to mana wahine when evaluating the experiences of tangata whenua in relation to the inquiry district's inland waterways.

These themes are examined and further developed in the report and illustrated through a number of detailed case studies on selected waterways within the Porirua ki Manawatū Inquiry District.

1.3 The Value of Water to Hapū and Iwi

The kaupapa at the centre of this report is the enduring whakapapa relationships of hapū and iwi to their inland waterways, and the immense significance and value that is ascribed to them.

In a Māori worldview, waterways are everything: they are the conduit and giver of life; the arterial network giving sustenance to Papatūānuku and all who live on her; and the means by which she is able to cleanse herself of impurities. As literal and metaphysical providers of life and sustenance that carry ancestral connections, waterways are central to

hapū and iwi identity – as expressed and celebrated in pepeha, histories, whakatauki, waiata, and stories. These whakapapa relationships are necessarily reciprocal, where the physical and spiritual wellbeing of each is inextricably tied to the other, conferring the need for kaitiaki to protect the mauri or life force of waterways so they can maintain their vitality and, in turn, continue to support the mauri and vitality of their hapū and iwi. Protecting mauri involves keeping waterways free from the harm of pollutants, degradation, and interference from other water bodies – and caring for their physical health through responsible and sustainable resource use practices, and their spiritual health through the observance of tikanga.[13]

The value of waterways to Māori cannot be overstated, as demonstrated by the long history of hapū and iwi claims to their rivers and other waterways and the plethora of reports regarding these taonga prepared by the Waitangi Tribunal over the last two decades.[14] This value has cultural, spiritual, and economic dimensions. Not only do waterways have cultural value due to their centrality to hapū and iwi identity and wellbeing, as outlined above, they are also a key source of mana, including through the manaaki of visitors by being able to serve locally renowned delicacies sourced from them such as eel, whitebait, and other freshwater fisheries. Waterways continue to have value in the spiritual lives of whānau, hapū, and iwi through the practice of rituals, such as tohi rites, the maintenance of wāhi tapu, and through their use as a rongoā for healing and wellbeing.[15]

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13 TK Morgan, Waiora and Cultural Identity: Water Quality Assessment Using the Mauri Model, in *AlterNative*, 3(1), 2006, pp 43-48; J Ruru, *The Legal Voice of Māori in Freshwater Governance: A Literature Review* (Wellington: Landcare Research Manaaki Whenua, 2009), pp 18-19; J Ruru, 'The Right to Water as the Right to Identity: Legal Struggles of Indigenous Peoples of Aotearoa New Zealand', in *The Right to Water: Politics, Governance and Social Struggles*, edited by Farhana Sultana and Alex Loftus (London: Earthscan, 2011); and Waitangi Tribunal, *The Stage 1 Report on the National Freshwater and Geothermal Resources Claim* (Wellington: Legislation Direct, 2012), pp 35-60.

14 Waitangi Tribunal, *He Maunga Rongo: Report on Central North Island Claims, Stage One*. 4 vols (Wellington: Legislation Direct, 2008); Waitangi Tribunal, *Report of the Waitangi Tribunal on the Kaituna River Claim* (Wellington: Government Printing Office, 1984); Waitangi Tribunal, *Te Ika Whenua Rivers Report* (Wellington: GP Publications, 1998); Waitangi Tribunal, *Te Whanganui-a-Orotu Report*, 2nd ed. (Wellington: GP Publications, 1997); Waitangi Tribunal, *The Mohaka River Report* (Wellington: Brooker and Friend Ltd, 1992); Waitangi Tribunal, *The Stage 1 Report on the National Freshwater and Geothermal Resources Claim* (Wellington: Legislation Direct, 2012); and Waitangi Tribunal, *The Whanganui River Report* (Wellington: Legislation Direct, 1999).

15 Waitangi Tribunal, *The Stage 1 Report on the National Freshwater and Geothermal Resources Claim*, pp 54-60.

Physically, waterways were critical to hapū and iwi livelihoods and flourishing. They provided abundant sources of diverse foods including a multiplicity of fish species, eels, and water birds, and formed the basis of the Māori economy in the inquiry district. This economic value meant that waterways were primary locations by which to live and establish pā. Swamps in particular were also abundant sources of materials such as flax and raupō for building and clothing, and of plants for medicines and dyes. Waterways also helped support the growth of extensive stands of forest trees used for building and construction. Connections between waterways formed important aquatic highways for travel and trade – by canoe (and later by boats and ships) and on foot. Waterways continue to have economic value for hapū and iwi, and particularly as a food source where access to waterways and water quality allows for it.[16]

Following the signing of Te Tiriti o Waitangi in 1840, and as a result of changes in land ownership, from Māori customary arrangements to individual title via the Native Land Court, and the subsequent acquisition of vast tracts of land by the Crown and settlers from the 1870s onwards, the district's landscape became utterly transformed. Almost all of the extensive forest cover was systematically cleared to create pasture lands for farming, followed by near total drainage of the district's vast network of wetlands to create yet more land for farming.[17] This transformation effectively removed the very basis of the Māori food economy, transplanting it with a farming-based economy that has critically compromised the wellbeing of hapū and iwi as much as it has the land and waterways.[18]

Intensive deforestation and the drainage of wetlands not only resulted in habitat loss for birds, fisheries, and plant species on a grand scale, it also resulted in erosion and the silting up of inland waterways. The expansion of the farming frontier and growth of European settlement, opened up by the construction of the railway line from Wellington to Manawatū in the 1880s, led to the development of river water extraction systems to supply farms, towns, and industry with water and electric power, and of systems to

16 Ibid, pp 52-53.

17 H Smith, A Spinks, and M Poutama, *He Tirohanga Whānui: An Overview of Ecosystems Undergoing Rehabilitation in Manaaki Taha Moana, Horowhenua Case Study: Manaaki Taha Moana Research Project Report No. 19*, (Palmerston North: Massey University / Ōtaki: Taiao Raukawa Environmental Resource Unit, 2014), pp 24-26.

18 J Ruru, *The Legal Voice of Māori in Freshwater Governance: A Literature Review*, pp 18-19.

discharge waste back into them.[19] Engineering and flood control works to protect farmland and towns soon followed, with large scale river works being undertaken to straighten out 'problematic' bends in rivers and remove the build-up of silt from erosion. Gravel from erosion was also removed from rivers and sold for roadworks and riverbank stop bank protections.[20]

The change in ownership over much of the district's lands, from Māori to European, and the resulting change in land use, from a 'waterscape' to a farming 'landscape',[21] has meant a fundamental change in the way inland waterways are valued and understood. Instead of taonga or tūpuna to be treated with the utmost care and respect so that their inter-connected mauri is maintained, the Crown and its delegated local authorities have regarded waterways as commodities for the wider colonial project of capitalist expansion, to exploit and modify as required. As a commodity resource, waterways are both a water supply for open plunder (with use often over-allocated) and a place for the 'cost-effective' disposal of waste whether that be dairy farm run-off, (un)treated sewerage and storm water from towns, the tipping of rubbish, or industrial effluent such as that from abattoirs and milk processing plants. As a result, the water quantity (levels and flows) and quality of the inquiry district's inland waterways have become significantly degraded since 1840 – and the fish, plant, and bird species they once supported have significantly diminished or disappeared.[22]

Colonisation not only transformed the physical landscape in line with the capitalist ideology of the Crown, it also transformed the relationships between people, and particularly between men and women. The imposition of European patriarchy and the ideology of the primacy of men disrupted the balance between mana wahine and mana

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19 M D Law, *From Bush to Swamp: The Centenary of Shannon 1887-1987* (Palmerston North: The Dunmore Press, 1987), pp 105-112; and Ōtaki Historical Society, *Historical Journal, vol. 1* (Ōtaki: Ōtaki Historical Society, 1978), p 8.

20 H Smith, A Spinks, and M Poutama, *He Tirohanga Whānui: An Overview of Ecosystems Undergoing Rehabilitation in Manaaki Taha Moana, Horowhenua Case Study: Manaaki Taha Moana Research Project Report No. 19*, p 25.

21 Waterscape was a term used by Ngāti Pare and Te Ati Awa participants in their wānanga to describe the ancestral landscape within and surrounding their rohe. Their explanation was that the region compromised of as much water, if not more, than land, and thus, rather than describe the landscape it should be termed waterscape, especially given the context and focus of this research.

22 M Mulholland, 'The Death of the Manawatū River', in *Māori and the Environment: Kaitiaki*, edited by Rachael Selby, Pātaka Moore, and Malcolm Mulholland (Wellington: Huia Publishers, 2010); DB Emery, Affidavit to the Waitangi Tribunal for the National Freshwater and Geothermal Resource Inquiry, Wai 2358, 2 September 2016.

tane that is fundamental to a Māori worldview.[23] It effected a marginalisation of ātua wahine and their role alongside ātua tane in the creation of the natural world; of the kaitiakitanga of ātua wahine over the realms of water, rain, sand, gravel, species of trees and birds, of the offspring of the oceans and waterways, of seasons and elements and atmospheric conditions, and indeed of the fertility of land and water.[24] Significantly for this report, this imposition also marginalised Māori women's central role as kaitiaki of inland waterways and thus of their mana, leadership, and knowledge of this realm passed to them by their ātua and tūpuna wahine. The theme of mana wahine has been included in this historical report to help redress the balance between mana wahine and mana tane, and restore the mana, leadership, and knowledge of Māori women in the kaitiakitanga of waterways in the inquiry district.

> 'There's a whakapapa that our people understand that connects Hinetumaunga to Hinewai to Parawhenuamea to Hinemoana; all the aspects of the environment are understood and the kaitiaki for all those different parts particularly water and land forms are all ātua wahine…. All the species of fish, all the species of birds, they all come from that whakapapa. It's really important to understand all those relationships.'
>
> 'The Crown minimised the women's contribution to the environment because all that knowledge has been disjointed because the emphasis is on the male progeny. They talk about Tangaroa, Tane Mahuta and the 70 male ātua. Every male ātua has a female ātua so there's a particular part of knowledge that's been lost…. The lives of our people have been changed by colonisation and the loss of that knowledge. So it's important that we reclaim it.'
>
> 'The women of the tribe retained a lot of knowledge of not only fishing, growing kai, gathering kai – but the whole system of knowledge. So there's a women's

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23 A Mikaere, *Colonising Myths, Māori Realities: He Rukuruku Whakaaro* (Wellington/Ōtaki: Huia Publishers and Te Tākupu, Te Wānanga o Raukawa, 2011), pp 299-306; L Pihama, *Tihei Mauri Ora: Honouring Our Voices: Mana Wahine as a Theoretical Framework*, unpublished PhD thesis, University of Auckland, 2001, pp 234-281.

24 A Yates-Smith, 'Māori Goddesses in Literature Part 2: 1900-1940', in *Journal of Māori and Pacific Development* 2:1, 2001, pp 67-96.

side to it as well as a male side.' Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata.'[25]

This leadership and knowledge is clearly much needed. Water quantity and quality issues in the inquiry district remain due to the continued intensification of pastoral farming and expansion of cropping; the expansion of urban, rural, and costal populations; the continued loss of wetlands through drainage and stock and pest damage; and the continued issuing of consents by local authorities to allow discharge to rivers rather than land.[26]

Water quantity and quality issues also remain due to the continued failure of the Crown to enact a legislative and regulatory regime that effectively protects inland waterways against pollution and degradation, and to oversee and hold local bodies to account for the responsibilities in water management delegated to them. Indeed, it was only in the 1950s that the Crown first turned to consider the pollution of waterways.[27]

And water quantity and quality issues also remain due to the continued failure of the Crown and its delegated local authorities to recognise and respect Māori customary rights and interests in the management of waterways as affirmed and guaranteed in Te Tiriti o Waitangi. After 1840, the Crown began to devolve significant kawanatanga functions over inland waterways to provincial, and later, local governments. However, the Crown has consistently failed to also devolve their Te Tiriti o Waitangi guarantee to protect the tino rangatiratanga of hapū and iwi. As a result, local authorities have consistently and frequently acted in isolation of Te Tiriti and exceeded their delegated kawanatanga role. The Crown has also consistently failed to monitor local bodies use of such delegated powers so that local bodies continue to violate their obligations under Te Tiriti o Waitangi

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25 Interview with Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata, at Archives, Wellington, 12 October 2016, in Appendix V.

26 Horowhenua District Council, *Our Environment 2001: Horowhenua State of Environment Report*, (Levin: Horowhenua District Council, 2002), pp 5-19, 27-29; and H Smith, A Spinks, T Hoskins, and M Poutama, *State of Ecological/Cultural Landscape Decline of Horowhenua Coastline Between Hōkio and Waitohu Streams: Manaaki Taha Moana Research Report No. 2*, (Palmerston North: Massey University, 2011).

27 C Knight, *Ravaged Beauty: An Environmental History of the Manawatū* (Auckland: Dunmore Publishing, 2014).

with almost absolute impunity.[28] Alongside this the Waitangi Tribunal has continued to provide the reminder that the:

> 'Crown obligation under Article 2 to protect tino rangatiratanga is a continuing one. It cannot be avoided or modified by the Crown delegating its powers or Treaty obligations to the discretion of local or regional authorities. If the Crown chooses to delegate, it must do so in terms which ensure that its Treaty duty of protection is fulfilled.'[29]

Perhaps unsurprisingly then, the continuing, multi-faceted significance and value of waterways to hapū and iwi in the inquiry district has not been reflected back in Crown records, in records kept by agencies with devolved kawanatanga authority, or in newspaper reporting. In conducting the research for this report, the research team found very little evidence of the Crown's recognition or acknowledgement of Māori customary rights and interests in inland waterways, and particularly prior to the mid-1990s. While Te Tiriti o Waitangi had guaranteed to hapū the active protection of pre-existing customary rights and interests in taonga such as waterways and inclusive partnership, by and with the Crown, the near absence of records show their rights and interests have instead been, and continue to be, marginalised and their role as partners largely excluded. In response to the Resource Management Act 1991 and its requirement for greater consideration of Māori interests by local authorities, records show that some working relationships and shared initiatives around the district's waterways have been developed. As the following chapters of this report detail, however, any gains tend to rest heavily on the good will of particular council members and/or staff, which needs to be constantly or at least regularly renegotiated. This is because of an ongoing lack of guidance from the Crown, where there continues to be no compulsion in the Act for local authorities to consult with hapū and iwi and to share or transfer decision-making power to them.[30]

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28 J Hayward, 'In Search of Certainty: Local Government Policy and the Treaty of Waitangi, in *'Always Speaking': The Treaty of Waitangi and Public Policy*, edited by Veronica MH Tawhai and Katarina Gray-Sharp (Wellington: Huia Publishers, 2011), pp 79-82.

29 Waitangi Tribunal, *Ngawha Geothermal Resource Report 1993* (Wellington: Brooker and Friend Ltd, 1993), pp 153-154.

30 J Hayward, pp 88-92.

1.4 Structure of the Report

The history of colonisation in the Porirua ki Manawatū Inquiry District is also clearly a history of the pollution and environmental degradation of its inland waterways. This has come about in three key ways:

- by large scale land acquisition and the change in value systems, from Māori to European, that this brought to the region;
- the Crown's ongoing failure to protect waterways from pollution and degradation as a European value system took hold and expanded; and
- the persistent and enduring failure of the Crown and its delegated local authorities to recognise and respect the tino rangatiratanga of hapū and iwi over their bodies of water and the principles of kaitiakitanga of hapū and iwi that maintain their mauri.

The purpose of this historical report is to examine claims issues relevant to this history of pollution and degradation and what it has meant for the relationship of claimant hapū and iwi to their inland waterways of significance and for the wellbeing of both.

The scale of environmental change has been immense, from waterscape to landscape, and so too has been the impact on the hapū and iwi of the inquiry district. It has destroyed much of the mahinga kai and the traditional food economy they once relied upon to sustain them; it has limited access to their remaining mahinga kai and sites of cultural significance; and it has degraded water quality to the point where rituals are often unable to be practised and food stocks are often unable to be found or are not safe for consumption. Limited access and the imposition of the Crown's inadequate regulatory regime has also meant a separation of the relationship with their waterways and a diminished ability to practice and pass on the tikanga and mātauranga associated with their care and protection,[31] which has, in turn, disrupted the use and practice of te reo Māori.[32]

Claimant hapū and iwi did not consent to the extinguishment of their rights over their inland waterways – their taonga, their tūpuna awa, their economic livelihood, their spiritual sources of sustenance. Instead, the Crown has progressively assumed exclusive

[31] H Smith, A Spinks, T Hoskins, and M Poutama, p 38.
[32] M Selby and W Winiata, in M Poutama, A Spinks, and L Raumati, pp 87-88.

authoritative control over their waterways through the passage of a host of different statutes since the 1850s. These have included:

- Constitution Act 1852 – the creation of provinces to which some responsibilities for land and water management were devolved;
- 1850s – the application of English common law principles that the ownership of riverbeds and riverbed resources goes with the ownership of riparian land;
- Land Transfer Act 1852 – introducing *ad medium filum aquie* to waterways;
- Highways and Watercourses Diversion Act in 1858 – providing for the diversion and other means of controlling of water, including drainage;
- Native Land Acts 1862 and 1865 – the cutting of Māori customary land into parcels to facilitate sale and sever the communal way of life;
- Municipal Corporations Act 1867 – giving local bodies powers relating to the provision of water supply and sewerage systems;
- Abolition of the Provinces Act 1876 and the Counties Act 1876 – abolishing provincial governments and establishing a new system based on city, borough, and county councils;
- 1870s – public works and river transport, introduced fisheries, and timber floating;
- Public Works Act 1876 – providing for, inter alia, councils to impound, divert or take water, and to widen, deepen and straighten or otherwise alter the course of water;
- 1870s-1880s – freshwater fisheries;
- Public Health Act 1872 – providing for sewers to be emptied where local health boards deemed necessary;
- River Boards Act 1884 – establishing and empowering River Boards;
- Land Drainage Act 1893 – establishing and empowering Land Drainage Boards, and successive amendments, consolidated in the Land Drainage Act 1908;
- Water-supply Act 1891 – giving councils the power to establish water-race districts and schemes, and charge water rates;
- Coalmines Act Amendment Act 1903 – providing for the ownership of beds of navigable rivers, the application of the *ad medium filum aquie* rule to non-navigable rivers, and use of water for power generation;

- Horowhenua Lake Act 1905 – establishing the lake as a public recreation reserve to be managed by a board with at least one-third Māori membership, amended by the Reserves and Other Lands Disposal Bill 1916 where Māori membership was set at a maximum of one-third;
- Rating Act 1908 and Rating Amendment Act 1913 – providing for the rating for land, including Māori land;
- Swamp Drainage Act 1915 – providing for the large-scale drainage of wetlands and stream systems;
- Manawatū-Oroua River District Act 1923 – vesting control of the Oroua River in the Manawatū-Oroua River Board;
- 1940s – flood protection and river control and modification works, including the Soil Conservation and Rivers Control Act 1941;
- Town and Country Planning Act 1953 – providing for the control of land and waterways utilisation by local authorities;
- 1960s – regulating the use of water (taking and discharging) for all purposes other than domestic supply, watering stock, and fire-fighting;
- Reserves and Other Lands Disposal Act 1965 and vesting of accretions in the Crown;
- Water and Soil Conservation Act 1967 – providing catchment boards with powers to manage both water take and water discharge;
- Local Government Amendment Act 1989 – amalgamating the borough and county council system into city and district councils, and establishing new regional councils; and the
- Resource Management Act 1999 – providing for the resource management of waterways and beds of rivers.

To deliver on its purpose, the report is presented in two parts:

- Part one includes chapters which examine the marginalisation of the value of inland waterways to hapū and iwi through specific and deliberative Crown activities and failures in the inquiry district in relation to: title and ownership; flood control; gravel extraction; water use; and resource management; and

- Part two includes chapters which examine the impacts of those activities and failures on water quality and fisheries and wetlands in the inquiry district, and on the wider wellbeing of the claimant hapū and iwi.

Given the large number of waterways in the inquiry district, not all have been able to be included in this report. Nor have the waterways been able to be researched and reported on in a comprehensive manner as has been the case when a particular waterway has been the sole subject of interest, such as in the report on the Rangitikei River and its tributaries.[33] Instead, the research team elected to examine the themes of the project brief through case studies on a number of selected waterways that illustrate the key failures of the Crown – and which can be applied more widely to the other waterways in the inquiry district.[34] As such, the report includes 21 in-depth case studies which were selected both as a result of the oral history interviews with claimants, and on the availability and accessibility of data. Much of the extensive archival records held by Archives Central in Feilding and the Kāpiti Coast District Council was incomplete or not well organised, with some material lost as a result of fires and other material listed as missing or unreturned. Access to records held at Archives New Zealand in Wellington was also limited by damage to the building following the earthquake of 14 November 2016, with access only partially restored on 24 January 2017. The themes of colonisation and of mana wahine are not presented or discussed in the chapter format of the other themes, but have instead been threaded into the narrative of the report where deemed applicable and appropriate.

The study of waterways is necessarily complex, mirroring the complexity of water as a flowing resource that changes as it moves through the landscape and over time. But it is also important and informative. Waterways are the collection point of all land-based activity, and as such, they are the ecosystem that experiences that accumulation first and most intensely. They inform us of what is happening and point to the changes that need to be made to restore their mauri.

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33 D Alexander, 2015.

34 It was beyond the constraints of this project to cover all inland waterways throughout the Porirua ki Manawatū inquiry district. The idea to broaden the general korero over the entire rohe but to then focus on certain waterways as illustrative case studies was suggested by Sir Taihākurei (Eddie) Durie, hui with Te Hono, 1 February 2016.

PART ONE: CROWN ACTIVITIES AND FAILURES

2. TITLE AND OWNERSHIP

2.1 Introduction

A Māori worldview is based on a complex network of whakapapa relationships that maps out the interconnected relationships between the human, natural, and spiritual worlds.

Ani Mikaere of Ngāti Raukawa has written and presented extensively on the centrality of whakapapa to a Māori worldview. In her research of the manuscripts of Mātene Te Whiwhi, which contained material dictated to him during the 1850s from his uncle Te Rangihaeata, it was very clear that whakapapa was key to Te Rangihaeata's worldview. She wrote:

> 'He provides a range of whakapapa, all of which clearly establish the links between people and the rest of creation; our non-human relations include day and night, earth and sky, clouds, winds, stars, the forest, the sea, the kumara, the kiore and a multitude of others.'[35]

She also wrote that:

> 'The physical environment was woven through the everyday lives of our tūpuna. The intimate connection between people and other aspects of creation flows naturally from an understanding of the world that is underpinned by whakapapa. Our tūpuna drew sustenance – physical, emotional, spiritual – from the world around them, a world which they understood as a complex system of relationships. They saw themselves as forming but one component of the system, and they understood that they needed to nurture a host of relationships with their non-human relatives in order to survive and to thrive. The nurturing of these relationships is the essence of kaitiakitanga, the practice of which represents but one aspect of the exercise of rangatiratanga.'[36]

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35 A Mikaere, *Te Tiriti o Waitangi me te Taiao*. Paper presented at Te Oranga o te Tangata, He Whenua Symposium, Te Wānanga o Raukawa, Ōtaki, 19 September 2014, p 6.

36 Ibid, p 1.

Within this worldview – as articulated by Rawhiti Higgott, a kaumatua of Te Ātiawa ki Whakarongotai – land and waterways are not 'owned' per se but are in the 'possession of' hapū and iwi to respect and care for so that they can be passed with their mauri intact to the next generation.[37] This understanding differed significantly to that of ownership brought to Aotearoa by the incoming settlers and the British Crown.

The signing of Te Tiriti o Waitangi in 1840 guaranteed the tino rangatiratanga of hapū and iwi over their lands, forest, fisheries and other taonga, which included the inland waterways and their resources. In doing so, it acknowledged and affirmed the existing constitutional reality of the total political authority of hapū over themselves and full possession of their taonga waterways.[38] Not all hapū signed, but a significant number did with over 500 rangatira from all around the country signing or marking the version written in Māori, and a small number the version written in English.[39]

> 'The Māori signatories were declaring and cementing their own supreme authority, while acknowledging and defining the presence of the Crown and its citizens in their midst.'[40]

A number of prominent rangatira, both men and women, within the Porirua ki Manawatū inquiry district trusted the Queen of England and her Official representatives at the time, and 44 of them placed their signature or mark on the Māori version at the following locations: Mana Island (two); Kāpiti Island (four); Waikanae (20); Ōtaki and Manawatū (18).[41]

Historically, the inquiry district had a large number of inland waterways with major river systems, streams, lakes, lagoons, swamps, springs, and groundwater throughout. These waterbodies were treasured for multiple cultural values by different iwi, as discussed in

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37 M Poutama, A Spinks, and L Raumati, *Porirua ki Manawatū Inquiry: Collation of Oral Narratives for Inland Waterways – Cultural Perspectives Draft Report* (Wellington: Crown Forestry Rental Trust, 2016), p 154.

38 M Jackson, 'The Treaty and the Word: The Colonisation of Māori Philosophy', *Justice, Ethics and New Zealand Society*, edited by G Oddie & R Perrett (Auckland: Oxford University Press, 1992), p 5.

39 C Orange, *The Treaty of Waitangi* (Auckland: Allen & Unwin, 1987).

40 A Mikaere, p 1.

41 C Orange, p 62.

the cultural perspective reports that accompany this historical report.[42] Following the signing of Te Tiriti o Waitangi, however, the guarantee of ongoing possession of inland waterways by hapū and iwi was not honoured by the Crown. Instead, they introduced English common law principles and passed successive pieces of legislation that gave water use and ownership rights to themselves and to riparian land owners and which transferred authority over waterways from hapū and iwi to itself, which it then delegated to its local government bodies.

This chapter provides a brief description of the historical circumstances since the signing of Te Tiriti o Waitangi, and the principles and laws used by the Crown to significantly reduce hapū and iwi possession of inland waterways. This has included: the application of the English common law principle that the ownership of riverbeds and their resources passes to the owners of riparian land; the Land Transfer Act 1852 which introduced the English common law *ad medium filum aquie* rule to waterways (that title to land adjoining a waterbody gives the holder ownership to the middle line); the Native Land Acts 1862 and 1965 which divided Māori customary land into parcels to facilitate sale to Pākehā settlers; the Public Works Act 1876 and its amendments which enabled the Crown to arbitrarily take land, including riparian land, for the development of public works; and the Coal Mines Amendment Act 1903 which transferred the ownership of navigable rivers to the Crown and which applied the *ad medium filum aquie* rule to non-navigable rivers.

At the time of Crown purchasing, the Crown provided reserves for Māori alongside rivers and lakes, principally for food gathering purposes, and in so doing knowingly took on a responsibility to ensure that the reserves could continue to be used for that purpose, until such time as the Māori owners indicated otherwise. The Crown failed in its fiduciary duty of protection towards the owners of the reserves when it ceased to consider the impact on Māori of its colonisation activities (such as drainage and introduction of non-native fish species). Having once ceased to observe its duty of protection, that then became the norm allowing an accumulations of adverse impacts.[43]

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42 H Smith, *Porirua ki Manawatū Inland Waterways Cultural Perspectives Report* (Wellington: Crown Forestry Rental Trust, forthcoming); and M Poutama, A Spinks, and L Raumati, 2016.

43 Personal communication, David Alexander, appraisal received during the Draft Report feedback stage. Received via email from Nicola Kiri-Smith, Crown Forestry Rental Trust 5 July 2017.

A number of prominent examples have been selected as case studies to highlight the failure of the Crown to uphold the intention of Article 2 of the Te Tiriti o Waitangi in relation to inland waterways within the inquiry district.

2.2 Hapū and Iwi Possession of Lands and Waterways

Although history tells us of the major battles between iwi within the inquiry district that created changes in who possessed which waterways, these are not the focus of this report. Instead, this section provides an historical account of iwi possession of waterways since the signing of Te Tiriti o Waitangi in 1840. A number of decisions have also been made in their presentation: the evidence is presented in chronological order with those 'date unknown' presented last as an attempt to remove any iwi bias; and the histories also merge into the contemporary context to ensure a Māori perspective is portrayed as the historical record is dominated by Pākehā accounts and their particularistic worldview. Indeed, in 1998, Sir Taihākurie Durie, who as Chief Judge of the Māori Land Court and Chairman of the Waitangi Tribunal, commented that Māori had been portrayed in history as:

> 'cardboard figures with blank minds awaiting intelligence. Many modern histories made real attempts to get inside the Māori value system but even so there was some tendency to see history in terms of the colonisers' precepts and to assess change in terms of the colonisers' agenda. There was no adequate reference to the agenda that Māori had already had or to the depth of the ancestral opinions that influenced Māori thinking… In brief Māori were often judge in European contexts and not on terms of their own.'[44]

More recently, Pātaka Moore, of Ngāti Raukawa and Ngāti Pareraukawa, made the following recommendation to the inland waterways research team:

> 'We should be careful using Māori Land Court Minute Books and other dated Pākehā literature. These sources can be useful for locations and descriptions, but there is a danger in using them for interpretation purposes. These early

[44] ET Durie, 'Ethics and Values in Māori Research', in *Te Oru Rangahau: Māori Research and Development Conference Proceedings*, edited by Te Pumanawa Hauora (Palmerston North: Te Pūtahi-ā-Toi School of Māori Studies, Massey University, 1998).

anthropologists and historians etc didn't see the world as Māori did, and therefore their interpretation of our world was/is distorted.'[45]

Ani Mikaere has also documented the ways in which Pākehā historians have recorded history – and particularly their recording of history through a patriarchal worldview which removed many of the references to rangatira wahine and their decision-making.[46]

The Mapping Sites of Significance Wānanga, held on the 28th of May 2016 with over 30 participants from throughout the inquiry district contributed to the development of iwi lists of their significant waterways and their cultural values (Appendices I-IV). The participants described the following classifications of inland waterways: rivers; streams; lagoons; lakes; swamps, springs, and groundwater. The research for this section through archives, libraries, and private collections discovered many extraordinary photos, paintings, sketches, maps, and interesting oral narratives. The following selection of historic records of different illustrative mediums have been selected to display the different waterway classifications from various locations within the district. These are used to support the assertion of the hapū and iwi claimants that all of the waterways within the inquiry district were once in their sole possession, and that they were an essential part of life and in pristine condition. Some of the illustrations of natural inland waterways include surrounding native bush and forest, however, the mass bush/forest-clearing endeavours of the early settlers are also evident in others. During the interviewing process with claimants for the inland waterways cultural perspectives project, it became evident that there has also been a dramatic change in the landscape witnessed within their lifetime.[47]

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45 Personal communication, Pātaka Moore, Te Hono ki Raukawa letter, from Whatarangi Winiata, subject Review of Associate Professor Huhana Smith IWCP Technical Draft Report completed by Ngāti Raukawa reviewers group, 15 December 2016.

46 Mikaere, 2011.

47 M Poutama, A Spinks, and L Raumati, 2016.

Figure 1: **Ngāti Toa Rangatira inland waterway and riparian scene by artist Charles Decimus Barraud, 1856.**[48]

[48] Sourced from Alexander Turnbull Library, in L Fordyce and K Machlehn, *The Bay: A History of Community at Titahi Bay* (Titahi Bay: Titahi Bay Residents & Ratepayers Progressive Association, 2000), p 22. Alexander Turnbull Library reference: B-084-014.

Figure 2: **Watercolour painting of Lake Horowhenua by Charles Barraud, 1857.**[49]

Figure 3: **Photograph of the Manawatū River and Gorge by Frank Coxhead, 1870-1890.**[50]

[49] Barraud, Charles Decimus, 1822-1897. [Barraud, Charles Decimus] 1822-1897 :[Horowhenua Lake, 1857 or earlier]. Ref: B-004-031. Alexander Turnbull Library, Wellington, New Zealand. http://natlib.govt.nz/records/23018343

[50] Te Papa Collection Ref: O.006845.

Figure 4: **Oroua River and Railway Bridge by Edith Halcombe, about 1878.**[51]

Figure 5: **Forest Lakes water colour painting by Mary Wills, 1926.**[52]

The earliest oral narrative that provides a history of the naming of significant rivers along the Horowhenua/Kāpiti coastline is of Hau-nui-a-nanaia, a rangatira and tōhunga of Rangitāne, Ngātiawa, and Te Ātiawa. In pursuit of his beloved who had run away with a

51 Te Papa photograph collection, Ref: 1992-0035-1874/12-1. Gift of Horace Fildes 1937.
52 Alexander Turnbull Library, Ref. A-462-154.

slave, his tale is remembered through traditional oral narrative held by the iwi along this coastline. As well as moteatea, a lullaby was published in Māori and English.[53] As was the traditional practice, the naming of these rivers marked the occurrence of significant events or described the landscape and waterscape of the region.

> 'Hau scooped up a handful of earth from the portion of the staff of Tūroa;
>
> He then crossed the river which won him great renown, and it was WHANGANUI;
>
> He splashed through cloudy waters, hence WHANGAEHU;
>
> He felled a tree so he could cross, hence TURAKINA;
>
> He strode across the land, hence 'Tīkei; (RANGITĪKEI)
>
> Then he stumbled, O maiden, hence MANAWATŪ;
>
> A buzzing sound assailed his ears, hence Hōkio;
>
> A tiny stream he named his own, hence ŌHAU;
>
> He held his staff as he spoke, hence ŌTAKI;
>
> The waters beyond were lost in the sands hence WAIMEHA;
>
> He stood and stared in amazement, hence WAIKANAE;
>
> Then he breathed a sigh of relief for he had come to Wairaka.
>
> And he cast a spell; fixing it above, and fixing it below.
>
> It was thus he came to rest, O maiden!'[54]

The following excerpt further outlines the naming of the Waikanae River by Haunui-a-nanaia.[55]

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53 T. Davis, 1990, He Korero Pūrākau mo ngā Taunahanahatanga a Ngā Tūpuna: Place Names of the Ancestors, A Māori Oral History Atlas (Wellington: New Zealand Geographic Board, 1990), pp 62-67.

54 Ibid, p 66.

55 URL: http:// http://teatiawakikapiti.co.nz/iwi-history/

Haunui-a-Nanaia is also well-known as the ancestor who named various tributaries and landmarks from Whanganui to Wellington. Within the boundaries of Te Āti Awa ki Kāpiti, the rivers of Waimeha and Waikanae are no exception.

The naming of the Waikanae River itself symbolises the serene nature of this area. The term, Waikanae, has two proverbial meanings. The first:

'Ka ngahae ngā pī, ko Waikanae'
'Staring in amazement, hence Waikanae'

This proverb recalls when Haunui-a-Nanaia was crossing the river. It was during a cloudless night in which the stars and moon were prevalent in the skies. When Haunui-a-Nanaia stared into the river waters, he noticed myriads of Kanae, or Mullet, swimming in shoals. What startled him was that the eyes of the Kanae were gleaming from the reflection of the stars and moon. Haunui-a-Nanaia was 'staring in amazement'. The essence of this proverb is also personified by the following proverb:

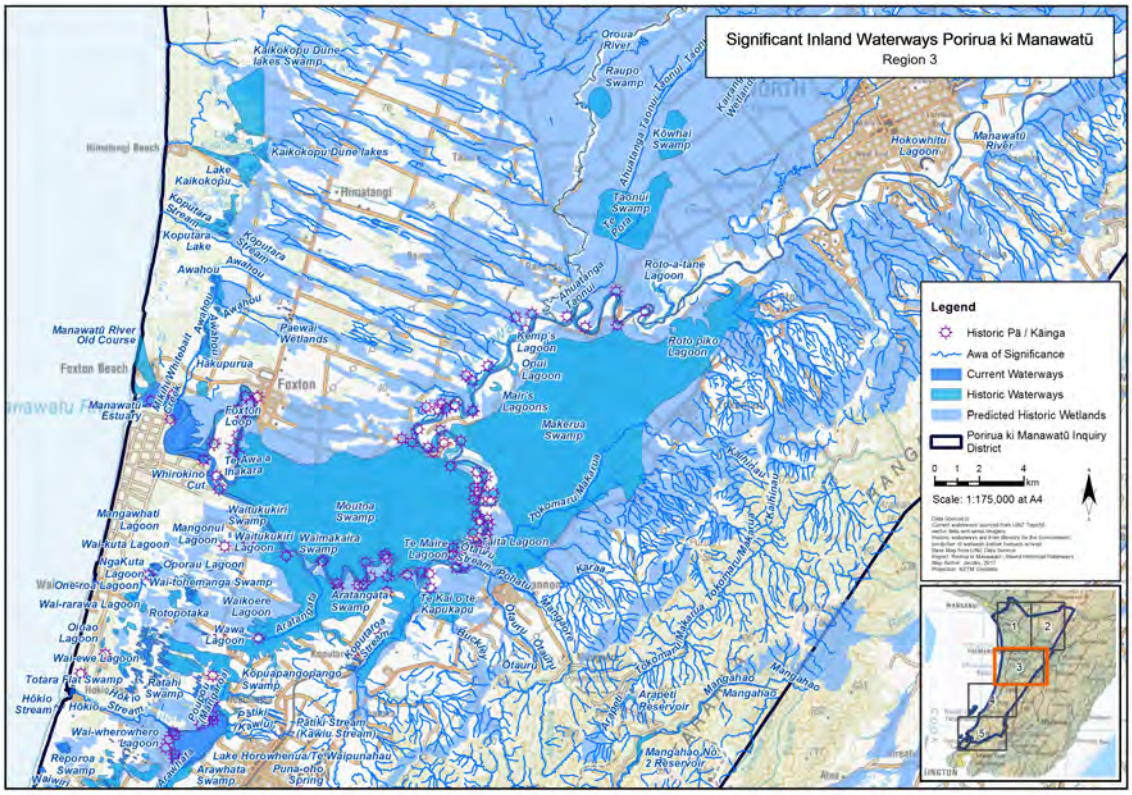
'Ko tōku waikanaetanga tēnei'
'This is my peace and humility'

This simple proverb captured by the naming of the river symbolises our (Te Āti Awa) relationship to the Waikanae area.

Prior to the arrival of Pākehā, Māori strategically placed their pā sites and papakāinga near waterways.[56] One obvious explanation is the essential fresh water they provided and the abundant food stocks they held, which was identified as still important today.[57] There are many other associated values of fresh water and inland waterways discussed in greater detail in this chapter, and throughout this report. The trend of historical pā and papakāinga situated near inland waterways is very evident in the Manawatū region historic map below.

[56] These sites of occupation were suggested as an important place to start discussing sites of significance to iwi by Steve Bray, Ngāti Kauwhata, at the Mapping Sites of Significance Wānanga, held 28 May 2016 at Tatum Park, Manakau/Kuku.

[57] Noted by Ngāti Kauwhata and Te Reu Reu participants at the Inland Waterways Wānanga held 12 May 2016 at Te Rūnanga o Raukawa office, Feilding.



Map 7: **Manawatū Region Historic Map.**[58]

Over 170 years ago, as European ships began to regularly visit the shores of Aotearoa the fortified pā of Māori along the coasts were recorded by literate Europeans, as well as drawn and/or painted by British and French artists.[59] These historic illustrations provide examples of inland waterways and their associated pā that were and remain significant to each of the iwi included in the inquiry district.[60]

58 Created by Jacobs, courtesy of Crown Forestry Rental Trust.

59 A Fox, Prehistoric Māori Fortifications in the North Island of New Zealand (Auckland: Longman Paul Ltd, 1976), p 5.

60 The exception is Ngāti Apa as their rohe is in the vicinity of the Rangitikei River which is excluded from the inland waterways research projects.

2.2.1 Ngāti Toa Rangatira

Figure 6: **Te Rangihaeata's fighting pā at Taupō in Plimmerton painted by G.F. Angas (1844).**[61]

This pā of Te Rangihaeata, Motu Karaka Pā, was situated on Strode Point at Taupō and was painted by George French Angas, an artist, naturalist, and writer on his visit to New Zealand for only four months in 1844.[62] Te Rangihaeata was a Ngāti Toa Rangatira chief, fighting strategist, and nephew that battled alongside Te Rauparaha, another well-known chief of Ngāti Toa Rangatira. They initially settled in the 1820's on Kāpiti Island and then spread out along the Porirua-Kāpiti-Horowhenua coastline, continuing to conquer large areas, which also included parts of the South Island, and with the aid of iwi allies Ngāti Raukawa and Ngātiawa (also known today as Te Āti Awa). Their renowned battles to establish themselves in this Porirua ki Manawatū inquiry district were to gain land and access to resources – and to position their iwi to strategically trade with the ever increasing numbers of European merchants. Te Rangihaeata and Te Rauparaha both signed Te Tiriti o Waitangi. The trade deals and fighting exploits of Ngāti Toa Rangatira have been well covered in numerous publications.[63] As seen in this setting the pā site is also located near a small stream the inlet on the right hand side of this painting.

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61 Sourced from Alexander Turnbull Library, in Fordyce and Machlehn, p. 37.

62 B Swabey, 'Māori Land Court Kāpiti: Waiorua Block', in *Ōtaki Historical Society Journal, Volume 8* (Ōtaki: Ōtaki Historical Society, 1985), p 70.

63 WTL Travers, *The Life and Times of Te Rauparaha, Chief of the Ngātitoa (*Wellington: publisher, 1872 reprinted Christchurch 1975); TL Buick, *An Old New Zealander or, Te Rauparaha, the Napoleon of the South* (Wellington: Whitcombe Tombs, 1911); T Te Rauparaha, *Life and Times of Te Rauparaha* (Martinborough: Alister Taylor, 1980); P Burns, *Te Rauparaha: A New Perspective* (Wellington: Reed, 1980); H Collins, *Ka Mate Ka Ora! The Spirit of Te Rauparaha* (Wellington: Steele Roberts, 2010); and R Kerr, *Not Only Te Rauparaha and Hadfield, But Also...* (Ōtaki: Black Pony, 2016), pp 13-17, 136-137.

2.2.2 Ngātiawa/Te Āti Awa ki Whakarongotai

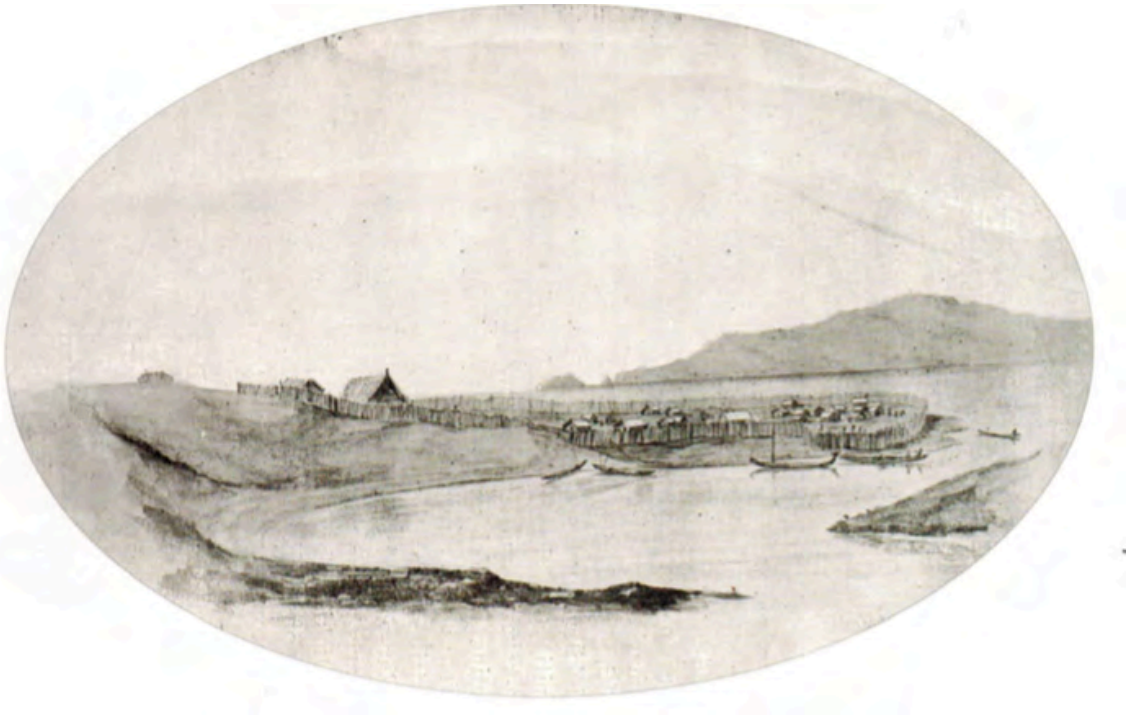

Figure 7: **Kenakena Pā next to the Waikanae River by JA Gilfillan, before 1847.**[64]

This sketch by JA Gilfillan is on record at the Alexander Turnbull Library with the date of production considered to be before 1847. Chris and Joan Maclean describe this illustration as a scene of the main Te Āti Awa pā at Kenakena on the south side of the Waikanae River mouth.[65] Wakahuia Carkeek clarified in his publication that this occupation site was at times known as Waikanae Pā, Kena Kena Pā, and Whangaingahau Pā.[66]

George Searle refers to the Waikanae Pā as being one of the greatest within the vicinity.[67] As evidence, he transcribed early quotes (below) from Pākehā visitors such as Doctor Earnest Dieffenbach of the New Zealand Company in 1839, Charles Heaphy an artist and

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64 JA Gilfillan, 1793-1864 :Wai-Kanae Pa and Kāpiti. [Before 1847]. Downes, Thomas William: Old Whanganui. Hawera, W. A. Parkinson, 1915. Ref: PUBL-0066-141. Alexander Turnbull Library, Wellington, New Zealand. http://natlib.govt.nz/records/23206108

65 C Maclean and J Maclean, *Waikanae* (Christchurch: The Whitcombe Press, 2010), p 26.

66 W Carkeek, The Kāpiti Coast: Māori History and Place Names of the Paekākāriki-Ōtaki District (Wellington: Reed Books, 1966), pp 150-151.

67 G Searle, Early Waikanae and Surrounding Areas: Ko Waikanae me Ngā Whenua Tata i Ngā Rā o Mua (Waikanae, 1988), p 133.

draughtsman to the New Zealand Company who also visited in 1839, and EJ Wakefield who also visited sometime between 1839 and 1844.[68]

> Dr Dieffenbach: 'The principal and most fortified pa" and "This latter village was very large; it stood on a sand-hill, and was well fenced in, the houses were neatly constructed. Everything was kept clean and in good order, and in this respect it surpassed many villages in Europe.'[69]
>
> Charles Heaphy: 'The Waikanae Pa stood on the sand hills, behind the beach, and may have contained about 350 natives, of whom about 200 were fighting men.'[70]
>
> E.J. Wakefield: 'This was the largest pa we had yet seen. The outer stockades were at least a mile in circumference; and the various passages between the different courts and divisions formed a perfect labyrinth.'[71]

Kāpiti Island is a prominent natural feature within the inquiry district, and is also evident in the illustration background. Kāpiti Island waterways were included in the inland waterways cultural perspectives project,[72] but following discussions with the Environmental & Natural Resource Issues Research Team it was agreed that the historic research pertaining to the significant waterways on Kāpiti Island be included in their report's case study and chapter dedicated to the island.[73]

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68 Ibid.
69 E Dieffenbach, in ibid.
70 C Heavy, in ibid.
71 E Wakefield, in ibid.
72 H. Smith (forthcoming); and Poutama, Spinks, and Raumati, 2016.
73 Personal communication, Vaughan Wood and Mark Derby, emails 15 November 2016.

2.2.3 Ngāti Raukawa ki te Tonga

Figure 8: **Pakakutu Pā, Ōtaki, 1850.**[74]

This 1850 pencil sketch of Pakakutu Pā by William Swainson was one of the Ngāti Raukawa pā located at the mouth of the Ōtaki River on the northern edge, also alongside where the tributary Mangapouri Stream joined the river. Te Tiriti o Waitangi was signed there in 1840.[75] As whānau moved inland to the present site of Ōtaki township this pā site was abandoned between 1846 and 1848.[76] Other historic pā sites in the near vicinity of the Ōtaki River mouth included the larger Rangiuru Pā inland and Katihiku Pā on the south side.

An interesting historic moment in the literature that includes the Pakakutu Pā and Waikanae Pā is the visit of missionaries Octavius Hadfield and Henry Williams in

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74 Swainson, William, 1789-1855. [Swainson, William], 1789-1855: Remains of Pakakutu, at the mouth of the Ōtaki River. 1850. [Swainson, William John], 1824-1887 :[Sketchbook, ca 1850]. Ref: NON-ATL-0125-01. Alexander Turnbull Library, Wellington, New Zealand. http://natlib.govt.nz/records/22518460.

75 http://natlib.govt.nz/records/22518460

76 Ibid.

November-December 1839, as detailed by Henry Williams in his journal notes.[77] Williams described Pakakutu Pā as a small one built on a flat piece of land at the mouth of the Ōtaki River belonging to the chief Te Ruru (also known as Kuru), who separated from the main pā so that he and his people could have "service to themselves without fear of interruption."[78] These two missionaries had met earlier with Te Rauparaha on Kāpiti Island and Williams made reference to Te Rauparaha's statement that "there should be no more fighting".[79] Williams and Hadfield left Pakakutu Pā on Sunday 24 November to continue peaceful discussions with Ngāti Raukawa chiefs at the main Ōtaki pā, named Rangiuru Pā, and on to Waikawa and Ōhau. The main subjects were the engagements with neighbouring iwi Ngāti Awa/Te Āti Awa, and the usual missionary activities. Late on Friday 29 November, the two men, accompanied by Te Whatanui and about 300 fighting men, left Ōtaki for Waikanae and slept on the beach from about 10pm to 3am. Williams then describes the state of tapu they were all in and the importance of food and clean water to drink from an inland waterway:

> 'We all pushed on at full stretch until we came within 3 miles of the Pā at Waikanae. The Chiefs here gave Mr. Hadfield and myself leave to drink at the brook and directions to go onward to Na Te Awa, to put up the white flag and declare their willingness for Peace. The Chiefs then came and shook hands and remained behind, and we continued our march not having eaten anything, except a small piece of biscuit since noon yesterday.'[80]

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77 H Williams, in Searle, pp 208-209.
78 Williams, in ibid, p 208.
79 Williams, in ibid, p 207.
80 Williams, in ibid, p 209.

2.2.4 Rangitāne

Figure 9: **Awapuni Lagoon, 1881.**[81]

This historic photograph, taken in 1881, includes an old wharepuni alongside the Awapuni Lagoon. It was retrieved from the Palmerston North City Central Library along with archival material including notes collated by Ian Matheson based on information supplied by Rangitāne elders Wiremu Te Awe Awe (Billy Larkins), Atareta Poananga, and Meihana Durie.[82] The full tribal name of the Rangitāne people who occupied the lands around Awapuni Lagoon is Tanenuiarangi.[83] Rangitāne fortified their pā in the Manawatū region against their strong neighbours. Upon selling a 250,000 acre block to the Crown they became strong allies and loyal supporters of the Crown, joining with their forces in 1860. The Papaioea clearing was central in the Te Ahua-Turanga or Upper Manawatū Block which was sold and later became the site of Palmerston North.[84] The Awapuni Lagoon was known to Rangitāne as having a rich source of eels and was thus no doubt a contributing reason for a small village known as Awapuni to be established there

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81 Palmerston North City Library, Palmerston North, New Zealand. Reference No. 2007N_Awa1_EPN_0252. http://digitallibrary.palmerstonnorth.com

82 Palmerston North City Library, http:// and Ian Matheson, *Notes of The Māori History of Palmerston North*, Palmerston North, 1986.

83 Ibid, p 1.

84 BGR Saunders and AG Anderson (Eds), *The Geography of New Zealand, Study 1, Introducing Manawatū* (Palmerston North: Massey University, 1964), p 1-3.

in 1866.[85] The name of the lagoon means 'blocked-up river', and alludes to the fact that many of these lagoons throughout this district were once part of the Manawatū River.[86] At this time, rivers in the region sometimes changed their courses as part of a natural process and moved unhindered throughout the landscape. The Awapuni Lagoon was one of five original lagoons within the Palmerston North City boundary, but, notably, only one (Hokowhitu) is in existence today. The Awapuni Lagoon was drained by early Pākehā settlers and was thus lost to urbanisation along with the surrounding native vegetation clearly evident in the photo as well as the Māori village. The beautiful lagoon and scenery in this photo has been replaced in the modern era by a drain and a racecourse.

2.2.5 Muaūpoko

Figure 10: **Kāinga at Lake Papaitonga with an artificial island offshore by C.D. Barraud, circa 1863.**[87]

85 Matheson, pp 5-6.

86 Ibid, p. 5.

87 Barraud, Charles Decimus, 1822-1897. Lake Papaitonga. Ca 1863. Reference B-004-030-1. Alexander Turnbull Library, Wellington, New Zealand./records/22678765. Black and White version also available at Palmerston North City Library, Palmerston North, New Zealand. Reference No. 2007N_Awa1_EPN_0252. http://digitallibrary.palmerstonnorth.com

Island pā, such as the Muaūpoko example above, were often strategically situated and at times artificially created within lakes significant to their iwi and hapū. Prime examples of island pā were within Te Moana-o-Punahau (known as Lake Horowhenua) and Lake Waiwiri (known as Lake Papaitonga). The illustration is a sketch by CD Barraud in 1863 and shows a kāinga by the shores of Lake Papaitonga with an artificial island behind. The kāinga stakes are visible in the lake which is surmised by Anthony Dreaver as evidence of an eel weir.[88] The artist did not specify the iwi association to this scene.[89]

Historic land and waterway ownership disputes existed between iwi, particularly in the 1800s by Muaūpoko, Ngāti Toa Rangatira, and Ngāti Raukawa in this region who fought physically, as well as later in the Native Land Courts. A brief history of the Horowhenua Block of land and associated dealings that affected iwi during this time is outlined by Terry Hearn in his report commissioned by the Crown Forestry Rental Trust.[90] Notable chiefs and Pākehā men that were influential and present during this time are mentioned here in order of appearance in the report: Te Rauparaha; Charles Kettle; Jerningham Wakefield; Te Whatanui; Major Kemp (Kepa Te Rangihiwinui); Hunia; Walter Buller; and Donald Fraser. Wi Parata was also mentioned but only referred to when making comparisons with the Ngarara land block. The mana that these men held at the time is explicit, the details of which is further explored in a number of other CFRT commissioned reports.[91]

Geoff Park wrote of Muaūpoko kuia Ururangi Paki taking her mokopuna to make her first kete at Lake Papaitonga as 'in her mind she is visiting her ancestors, her spirit landscape, the stretch of country that made her …'.[92] Muaūpoko kaumatua, Marokopa Wiremu-Matakatea, provided an explanation during the Mapping Sites of Significance Wānanga that water was essential to the life force of Papatūānuku and thus they refer to water as

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88 A Dreaver, Horowhenua County and its People: A Centennial History (Levin: The Dunmore Press, 1984), p 25.

89 Note: Ngāti Hikitanga Te Paea Wai 977 claimants have advised during the draft report feedback stage that their tūpuna Te Paea and his whānau were in occupation of the area from late 1827 to the 1870s. Personal communication, Margaret Morgan Allen, Claimant of Wai 977, Ngāti Hikitanga Te Paea, email 14 May 2017.

90 T Hearn, The Waitangi Tribunal Porirua ki Manawatū Inquiry District: A Technical Research Scoping Report (Wellington: Crown Forestry Rental Trust, 2010) pp 86-91.

91 Such as the Ngāti Raukawa oral history report.

92 G Park, Ngā Ururoa: The Groves of Life: Ecology and History in a New Zealand Landscape (Wellington: Victoria University Press, 1995), pp 180-181.

'toto' or blood.[93] In his interview at the same wānanga, Robert Warrington explained the association of the groundwater as toto/blood arterial systems supplying the lakes and the rivers:

> 'Those headwaters are so important because it connects the mountain to the land, to the sea, the underground waterways are the toto/the blood of those lakes that go to another particular water body Lake Punahau or Lake Horowhenua and then it goes down the arteries which is the Hōkio Stream and various other streams such as the Ōhau River (as an example). All those are akin to the arteries of the body, this sacred lakes blood lines.'[94]

The illustration below is a significant Muaūpoko pā and settlement known as Te Rae-o-te-karaka, situated on the western shore of Lake Horowhenua. The scene was painted by the same artist, CD Barraud, on his visit to the lake in the late 1860's.[95] In a subsequent publication, Anthony Dreaver noted the palisades protecting the village which he approximated to be about 50 buildings. [96] The native vegetation is also clearly present in this scene, along with fishing aspects such as the eel weir stakes in the foreground, and slim waka used primarily for fishing as well as to take bird snarers to different locations. The history and cultural values of Lake Horowhenua to Muaūpoko is more adequately researched and detailed in a report commissioned by the Waitangi Tribunal written by Paul Hamer and is thus not covered any further in this report.[97] Another report outlining Muaūpoko perspectives in more detail is the Waitangi Tribunal report 'Horowhenua: The Muaūpoko Priority Report'.[98]

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93 Personal communication, M. Wiremu-Matakatea, at the Mapping Sites of Significance Wānanga held 12 May 2016 at Tatum Park, Manakau/Kuku.

94 Poutama, Spinks, and Raumati, p. 129.

95 A Dreaver, *Levin: The Making of a Town* (Levin: Horowhwhenua District Council, 2006), p 7.

96 Ibid, p 7.

97 P Hamer, 'A Tangled Skein': Lake Horowhenua, Muaūpoko, and the Crown, 1898-2000, Wai 2200 document #A150, June 2015.

98 Waitangi Tribunal Report, *Horowhenua: the Muaūpoko Priority Report.* Forthcoming.

Figure 11: **Lake Horowhenua with eel trap and fishing waka sepia painting by Charles Decimus Barraud, 1860-1870.**[99]

2.2.6. Early Settler Historic Accounts

Early settlers provide descriptions of the natural environment within the inquiry district that supports the iwi statements of the original beauty of their landscape. Rod McDonald, the son of one of the first settlers to the Horowhenua district, described the area in the 1870's as:

> 'being clothed in natural vegetation: native grasses and bracken fern clothed ridges and flats; belts and irregular areas of *mānuka* and *tutu* occurred in many places; and clumps of flax and t*oetoe* occupied the damper situations. Patches of native bush, in some cases comprising mixed species including the larger forest trees, in others, pure stands of *kahikatea* and *karaka*, grew in favourable places. Occasional stretches of swamp and many beautiful lagoons, with clean-cut margins bounded by grassy slopes or copses of verdure, completed a landscape of unspoiled charm.'[100]

Thomas Bevan, who was born in Wales, travelled to Wellington in the same year as the signing of Te Tiriti o Waitangi, arriving in New Zealand in October 1840. He later wrote about his reminiscences, now published in the Ōtaki Historical Society Journal.[101] His

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99 Alexander Turnbull Library, reference: E-297-026.

100 RA McDonald and E O'Donnell, *Te Hekenga: Early Days in Horowhenua* (Palmerston North: GH Bennett & Co Ltd, 1929).

101 T Bevan, 'Reminiscences of an Old Colonist', in *Ōtaki Historical Society Journal Volume 5* (Ōtaki: Ōtaki Historical Society 1982), pp 82-89; in *Ōtaki Historical Society Journal Volume 6* (Ōtaki: Ōtaki Historical Society, 1983), pp 92-96; and in *Ōtaki Historical Society Journal Volume 7* (Ōtaki: Ōtaki Historical Society, 1984), pp 86-91.

accounts are of the local history of the Kāpiti-Horowhenua region. In 1845, he travelled by foot from Wellington with his siblings and a Māori guide named Ropina to meet his father and they settled near the mouth of the Waikawa River. He lived out the remainder of his life by the river amongst the Māori whānau who lived there. The Bevan family married into these whānau and were prominent in the local flax industry, including rope walks.[102] In his writings he described the 'kindness of all the natives' he meet along the journey.[103] He also depicted the beauty of the landscape on his arrival at the Waikawa River, which he refers to as having disappeared:

> '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.'[104]

Ecologist, Geoff Park, wrote of Lake Papaitonga and the environmental history of the site and surrounding area. His publication included a number of quotes from early settlers, including this one about Lake Horowhenua and the surrounding scenery:

> 'The lake lay clasped in the emerald arms of the bush which surrounded it on every side save immediately about where we stood. Mile after mile the bush stretched across the flat on which the town of Levin now stands, and swept up the mountain-side to the relief of the white snow-cap. Straight and tall the timber grew to the water's edge, fringed with flax and nodding mānuka and over the bush, flashing their white breasts as they circled and wheeled in the sunshine, pigeons flew literally in thousands, drifting from tree to tree, rising in flocks of half a hundred or so, with a whirring of wings plainly to be heard across the calm waters; circling round in a wide sweep with characteristic rise and dip of flight, skimming the lake... to rise and sweep back over the bush and settle on some other

[102] GL Adkin, Horowhenua: Its Māori Place-names and their Topographic and Historical Background, (Wellington: Department of Internal Affairs, 1948), p 143.
[103] Bevan, 1982, p. 86.
[104] Ibid.

> tree… No other sound was in the air, nor sight of life was visible, save where the smoke curled slowly upwards from the stockade pā of Raia Te Karaka. Across at Te Hou and Kouturoa some Māoris called musically one to another; in front of us was only the lake, the unspoiled bush and the mountains beyond.'[105]

During the Inland Waterways Cultural Perspectives Wānanga,[106] many of the participants in the Horowhenua region often referred our research team to the historic details recorded by George Adkin (1888-1964) in his book *Horowhenua – Māori Place-names and Their Topographic and Historical Background*.[107] Anthony Dreaver wrote a piece on Adkin for the Ōtaki Historic Society describing the man as a geologist, botanist, avid tramper, passionate photographer, archaeologist and ethnologist.[108] As a farmer in the Levin area, Adkin built relationships with local iwi and hapū which provided an extensive range of rich local ancestral knowledge of place for his publication. He received advice from Muaūpoko; from Emily Broughton (Mrs Hurinui Tukapua); Tapita Himiona and her son, Tiki Himiona Kowhai; Parawhenua Matakatea; Hori Wirihana; and Hohepa Kiriwehi. He was also well received by Ngāti Raukawa; Arapata Te Hiwi of Ngāti Tūkorehe; Manahi Te Hiakai, Mrs Polly Waihopi, Taniera and Hiwi Ranapiri (Ransfield) and P Rikihana of Ngāti Wehi Wehi; Karaitiana Te Ahu, Hone Makimereni (McMillan) of Ngāti Ngarongo; Poawha Hirini and Rawiri Tatana senior of Ngāti Huia; Taparoto (Howard Nicholson) of Ngāti Pareraukawa; Kipa and Aperahama Roera, Hinga Waretini (Mrs Hoani Kuiti) and Areta Tahaia of Ngāti Kikopiri; Heremaia Rangitawhia of Ngāti Te Rangi; Mere Hearse (Mrs Poaneki) and Riria Makirika (Mrs Sciascia senior) of Ngāti Whakatere; and Whare Kerei of Ngāti Kapu.[109]

During the research for this chapter, the original colour versions of the black and white maps in Adkin's Horowhenua publication were located in the George Leslie Adkin Photograph Album Collection held at the Alexander Turnbull Library. Due to their importance to hapū and iwi and relevance to the inland waterways within the inquiry district, and drawing on the original colour versions, the black and white maps have been

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105 Park, 1995, p. 172.

106 Inland Waters Cultural Perspectives Wānanga held 2 April 2016 at Kereru Marae, 16 April 2016 at Poutu Marae, 21 April 2016 at Huia Marae, 12 May 2016 at Te Runanga o Raukawa Feilding Office, and the Mapping Sites of Significance Wānanga held 28 May 2016 at Tatum Park, Manakau/Kuku.

107 Adkin, 1948.

108 A Dreaver, 'Who was Leslie Adkin?', in *Ōtaki Historical Society Historical Journal Volume 18* (Ōtaki: Ōtaki Historical Society, 1995), pp 18-25.

109 Dreaver, 1995, p. 171.

reproduced in colour and are included in Appendix V. It was thought important to also have similar maps for the south of inquiry district along the Kāpiti coastline. As such, the maps from Wakahuia Carkeek's publication on the Kāpiti region have also been reproduced in colour and are also included in Appendix V.[110]

2.3 Land Ownership and the Native Land Acts of 1862 and 1865

2.3.1 The Native Land Acts of 1862 and 1985

Early European traders were welcomed by Māori as they actively participated in the Māori economy through the lively trade of food and other resources. By the 1840s, land and cash were the currencies being imposed on Māori. Doctor Hazel Petrie wrote about the 'golden age' of Māori enterprise in the 1840s and 1850s.[111] Māori coordinated a multiplicity of economic activities, which were often hapū-led, and purchased capital items such as flour mills and crewing schooners – such as the Māori owned and operated flour mill in Poroutawhao.[112] This prosperity was cut short, however, by the mass alienation of Māori land and associated waterways in the inquiry district in the decades that followed.

After 1840 and the signing of Te Tiriti o Waitangi, the Crown held the pre-emptive right to purchase land directly from hapū and iwi. With growing opposition to land sales in the 1850s and an ever-increasing number of settlers wanting to buy land, the Crown sought to hasten the process by dealing with smaller groups, which led to tribal disputes and the Crown protecting those who were 'land-sellers'. In 1862, the Crown enacted the Native Land Act which abolished their pre-emptive purchase right and allowed for the direct purchase of land by settlers. The subsequent Native Land Act 1865 introduced the requirement of Māori to individualise their customary land tenure in the Native Land Court to further facilitate the sale of their lands. This severed the communal life of Māori and promoted rapid assimilation to European ways of living.[113] As one land speculator put it:

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110 W Carkeek, pp 168-178.

111 H Petrie, in D Luke, *Te Aho: The Woven Strands* (Ōtaki: Te Arahanga o Nga Iwi Ltd, 2014), p 15.

112 Photos of the replica flour mill are in the Inland Waterways Cultural Perspectives Technical Report, H Smith (forthcoming).

113 MPK Sorrenson, 'Land Purchase Methods and their effect on Māori population, 1865-1901', in *The Journal of the Polynesian Society*, Vol. 65, No. 3, 1956, p 184.

> '[It was] absolutely essential, not only for the sake of ourselves, but for the benefit of the Natives, that the Native titles should be extinguished, the Native customs got rid of, and the Natives as far as possible placed in the same position as ourselves.'[114]

The buying and selling processes under the Native Land Act led to Pākehā dealers being able to exploit Māori landowners in numerous ways. Dishonesty, bribery, and debt were some of the methods used by Pākehā to encourage land sales. Throughout, Māori often had to defend their lands in the Native Land Court, incurring costs and debts, in addition to those already incurred through surveying, to prove they owned or had a share in what they had already possessed. More costs still incurred from living away from their homes during Native Land Court trials which sometimes took years. Often the cases were held in Pākehā townships which increased their exposure to disease and the perils of alcohol.[115]

The different understandings of ownership added significant complexity to early land sales between Māori and settlers, as illustrated below:

> 'New Zealand Company officials and settlers in Nelson believed that uncultivated land was wasted land, and did not understand the Māori attitude to land nor that Te Rauparaha and other chiefs could, under Māori law, only give permission for temporary occupancy. This mis-understanding provoked the so-called Wairau massacre of 1843.'[116]

Te Rangihaeata was one rangatira in this inquiry district who actively engaged with the visiting traders and whalers. He was cautious of the threat of settlers though and is said to have reluctantly signed the Te Tiriti o Waitangi only because it appeared it would protect Māori interests. He opposed many of the land sales in the Porirua, Kāpiti, and Horowhenua areas. When opposing the sale of the Rangitīkei Block by Ngāti Apa in 1849, and the Manawatū Block by Te Whatanui, Taratoa and Te Ahukaramū, he placed a rāhui against the movement of stock along the coast and drove off cattle that were on the south bank of the Manawatū River. Then in Ōtaki, at a hui at Pakatutu Pā, he strongly opposed any settlers as well as their stock north of the Ōtaki River. He did, however,

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114 PD Vol. 24 (1877), p 254, in Sorrenson, p. 184.
115 Ibid, pp 185-191.
116 A Campbell, 'Te Rauparaha – The Old Serpent', in New Zealand's Heritage: The Making of a Nation, Vol 1 Part 12 (Auckland: Paul Hamlyn Ltd, 1971), p 318.

reconcile with Te Rauparaha's decision to allow the Pākehā living in Ōtaki to remain, but not their stock.[117]

By the late 1800s the wave of land selling had turned the former prosperity of Māori into general impoverishment. By 1892, and in breach of Te Tiriti o Waitangi, the Crown had effectively robbed Māori of much of their lands. Indeed, by that time Māori owned less than 16 per cent of the country and most of that was in remote locations or not valued by Europeans.[118] This was also the case for the hapū and iwi of the inquiry district where the majority of land alienation happened between 1849 and 1900, starting in the north Rangitikei area and south in Porirua and then moving towards the central coastal Horowhenua region.[119]

> 'As one old Māori, who was aware of the consequences, put it: "the law has been our ruin. In the time of our ancestors… we received no hurt similar to this. Give us back what land is left.'[120]

For the hapū and iwi of the inquiry district, the robbing of land also meant a robbing of much of their inland waterways and the abundant fish species, waterfowl, plants, and pristine freshwater which were the very basis of their economy and their cultural way of life.

2.3.2 Title and Ownership Today

Rampant land acquisition in the late 1800s in the inquiry district has meant that the ownership of land now held by Māori is significantly reduced.

To illustrate this, the following land ownership maps were created which shows the Māori owned and Crown owned land blocks in the Manakau-Ōhau area and in the Waikanae area further down the coastline. Māori ownership in the Manakau area is low at just over 20 per cent while Māori ownership in the Waikanae area is extremely low at 2.7 per cent – with the Manakau-Ōhau area classified as rural compared to the township of Waikanae. These areas and some of their significant waterways are case studies discussed later in this report.

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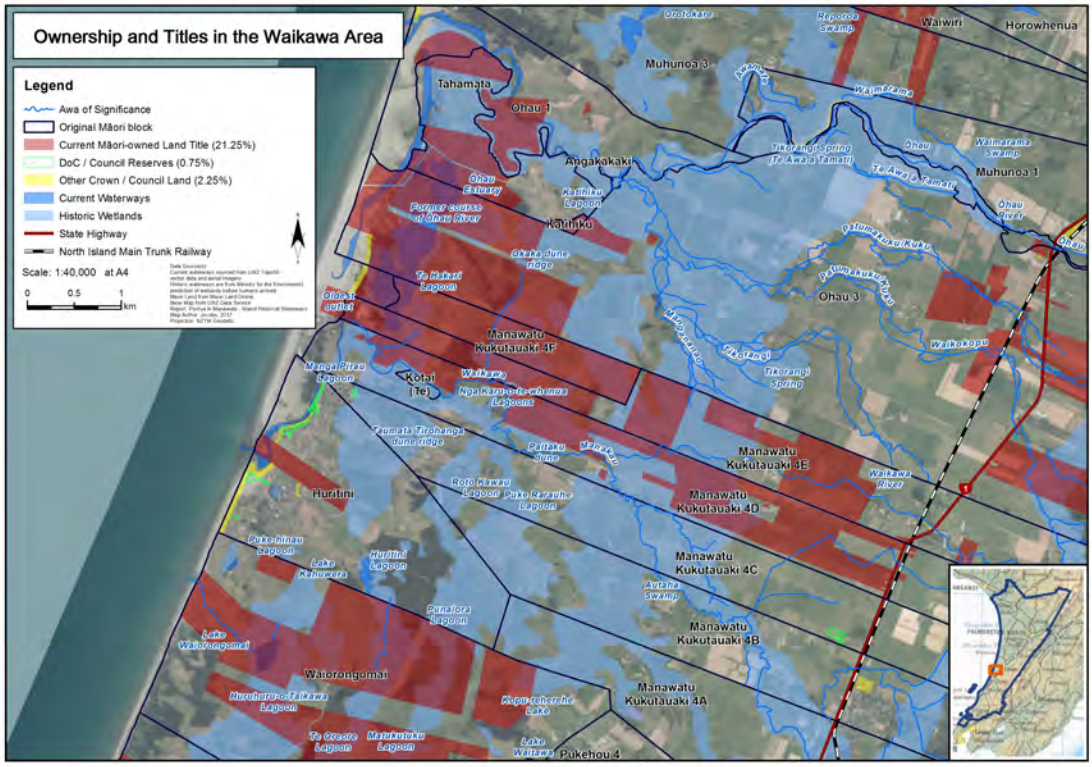
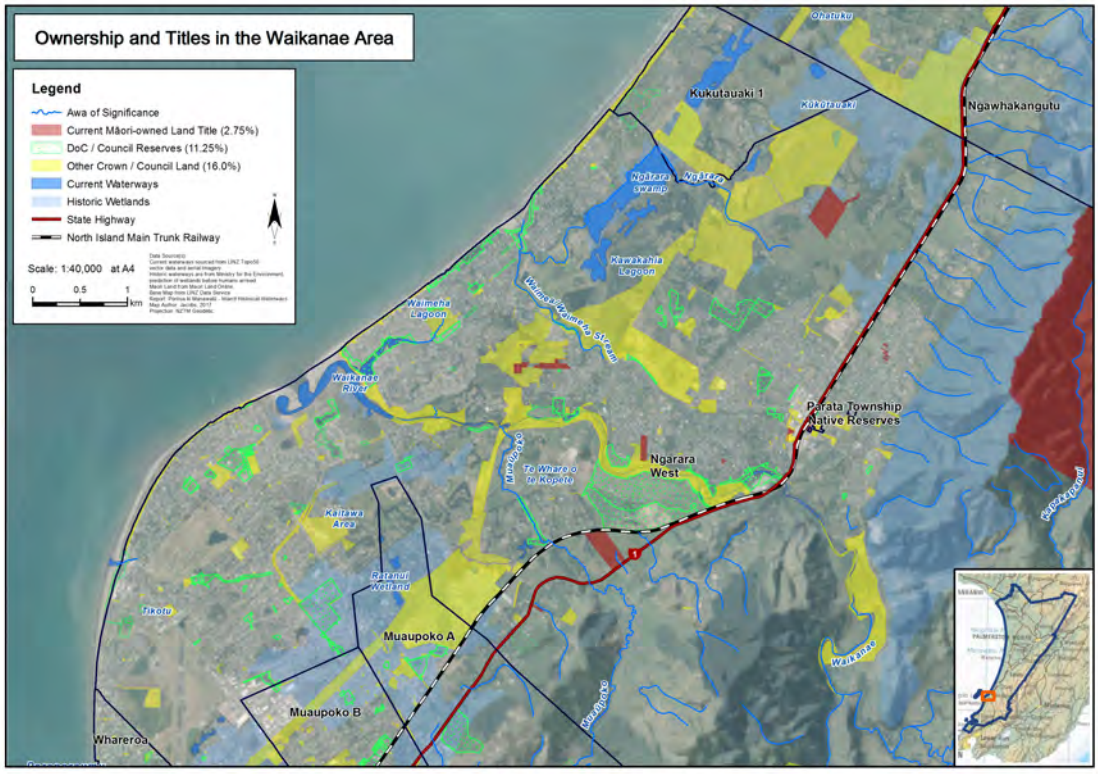
117 Kerr, 2016, p 136-7.
118 Sorrenson, 1956, pp 185-191.
119 R Lange, *The Social Impact of Colonisation and Land Loss on Iwi of the Rangitikei, Manawatū, and Horowhenua Region 1840-1960* (Wellington: Crown Forestry Rental Trust, 2010), p 5-6.
120 MacDonald, in Sorrenson, 1956, p 185.



Map 8: **Māori ownership in the Manakau-Ōhau area, 2017.**[121]



Map 9: **Māori land ownership in the Waikanae Area, 2017.**[122]

[121] Created by Jacobs, courtesy of Crown Forestry Rental Trust.

2.4 Denial of Access to Waterways

In breach of Te Tiriti o Waitangi and its guarantee to affirm the ongoing rangatiratanga of hapū and iwi over their taonga inland waterways, the Crown imposed the English common law principle that the ownership of riverbeds and riverbed resources goes with the ownership of riparian land. This, coupled with large scale land acquisition in the inquiry district, meant that hapū and iwi were effectively denied access to many of their waterways of significance – both directly when the adjacent land was no longer owned by them, and indirectly when access to their remaining lands and associated waterways were cut off by other blocks that they no longer owned.

While access to and customary use of some waterways was and is still possible in some instances through relationships and agreements with the new owners, the vital tino rangatiratanga over them and all waterways by hapū and iwi was also being incrementally eroded by the Crown. This further denied their access as kaitiaki. The legislation and regulatory mechanisms used by the Crown to transfer authority over waterways from hapū and iwi and delegate it to its local government authorities are discussed in the following chapters in Part One of this report.

Both the transfer of land ownership and the transfer of authority have led to a near totalizing transformation of the former waterscape to a farming landscape – which has greatly reduced the size of lakes, lagoons, rivers, and streams throughout the inquiry district, with the greatest impact on wetlands (see maps 2-6 in Chapter One). The disappearance of much of the network of waterways in the inquiry district has effected another denial of access.

What is clear is that the customary uses and kaitiakitanga of inland waterways and their resources, as well as the cultural practices associated with freshwater, were not voluntarily abandoned or alienated. Indeed, hapū and iwi have continued to access and use the inland waterways and their resources within the inquiry district since the land sales of the late 1800s, both where they are riparian land owners and where their customary rights are recognised in law – and where waterways are in the public domain or in private hands. But this already limited access has become incrementally more limited over time as a result of Crown regulatory failures and the subsequent biodiversity

[122] Created by Jacobs, courtesy of Crown Forestry Rental Trust.

loss from increasing pollution and decreasing habitats for aquatic fish, bird, and plant species.

2.5 Marginalisation of Mātauranga Māori

As raised by participants in the project's wānanga and interviews, a significant impact of the transfer of land and waterways and the transfer of authority away from hapū and iwi has been the loss of mātauranga and of iwi, hapū, and whānau specific local knowledge around the traditional uses and values of their waterways – and of a Māori worldview and its understanding of the whakapapa relationships that connect ātua, land, water, and people in a holistic system.[123]

Despite these limitations, claimants detailed a number of uses and values associated with their waterways. Waterways and their surrounding riparian margins were hugely important sites for mahinga kai and trade in food stocks and for obtaining resources such as rongoā, and materials for rāranga and whakairo. They were also important sites for spiritual practices, such as purification and tohi, wai ora, wāhi whakawātea, wāhi whakahaumaru.[124] Wāhi tapu were within some waterways as well as alongside them, including urupā and sites used to prepare bodies for burial.[125] Taniwha were present within particular waterways and at times travelled through groundwater. The rivers, streams, lakes and swamps in the inquiry district were also historically important for travel via waka and waka ama, and many were used for swimming and bathing.

2.5.1 Marginalisation of Customary Fishing Knowledges and Practices

Tuna are a taonga species that was once in abundance within the waterways of the inquiry district – and so too were other freshwater species such as īnanga, kōkopu, lamprey, kākahi, kōura. River mouths were known for species such as herring, mullet, kahawai, flounder, and freshwater cockles. They were all part of the staple diet of iwi and hapū in this region, and were key resources for trade and the expression of manaakitanga. A range of skills and expertise was required to maintain and cultivate these fisheries, and to ensure a plentiful catch.

The following four photos and the associated discussions relate to tuna. The skills used to create hīnaki from natural resources like the one in the following photo were once well

[123] H Smith, (forthcoming); and Poutama, Spinks, and Raumati, 2016.
[124] Personal communication, Caleb Royal, 15 December 2016.
[125] L Serrancke and M, in Poutama, Spinks, Raumati, 2016, p 98-104.

known by kaitiaki. The hīnaki is a fine example made from plaited tokoraro vines. The young boy, Clyde, is standing in the Hōkio Stream near the outlet of Lake Horowhenua.[126]

Figure 12: **A hīnaki of plaited tokoraro vines, 29 November 1925. Photo taken by G.L. Adkin.**[127]

Tuna weirs were constructed along streams where hīnaki were then set. The weirs were constructed out of branches such as mānuka and kānuka. The seasonal migration called

[126] Dreaver, 1997, photo insert No. 23 between pp 112 & 113.
[127] Alexander Turnbull Library. Reference: MONZTPT, B. 021666, in Dreaver,1997.

tuna heke was the time to catch large quantities of tuna heke as they headed to the ocean to spawn.[128] It was estimated that:

> 'On these runs that the eels were caught, not in dozens, but in thousands, by the Māoris, in their skilfully constructed "pa-tunas".'[129]

While Western scientists name two species of tuna, Māori name numerous species. The common dark brown, copper-bellied type have two varieties and were easily caught in hīnaki; puhi (a longer tuna) and hau (a shorter tuna). A common silver-bellied tuna, papaka, were caught on hooks. Using a hook or 'bob' was referred to as tui toke or herehere tuna. Rehi rehi eel had peculiarly large-heads, and yellow-bellies grew to large sizes in the lakes and were not eaten. The tuna heke were always headed by a couple of unusually large eels. Large eels caught by Muaūpoko were called Ruahine.[130] The same eel caught by Ngāti Raukawa was called tahi māro.[131] A number of these large eels also followed the tuna heke.[132] Different whānau or individuals had pa-tuna allotted to them. The following maps show the historical sites of eel weirs along the Hōkio Stream. There were well-known historic iwi and hapū protocols surrounding this customary fishing and storage methods as well as those used for other species.

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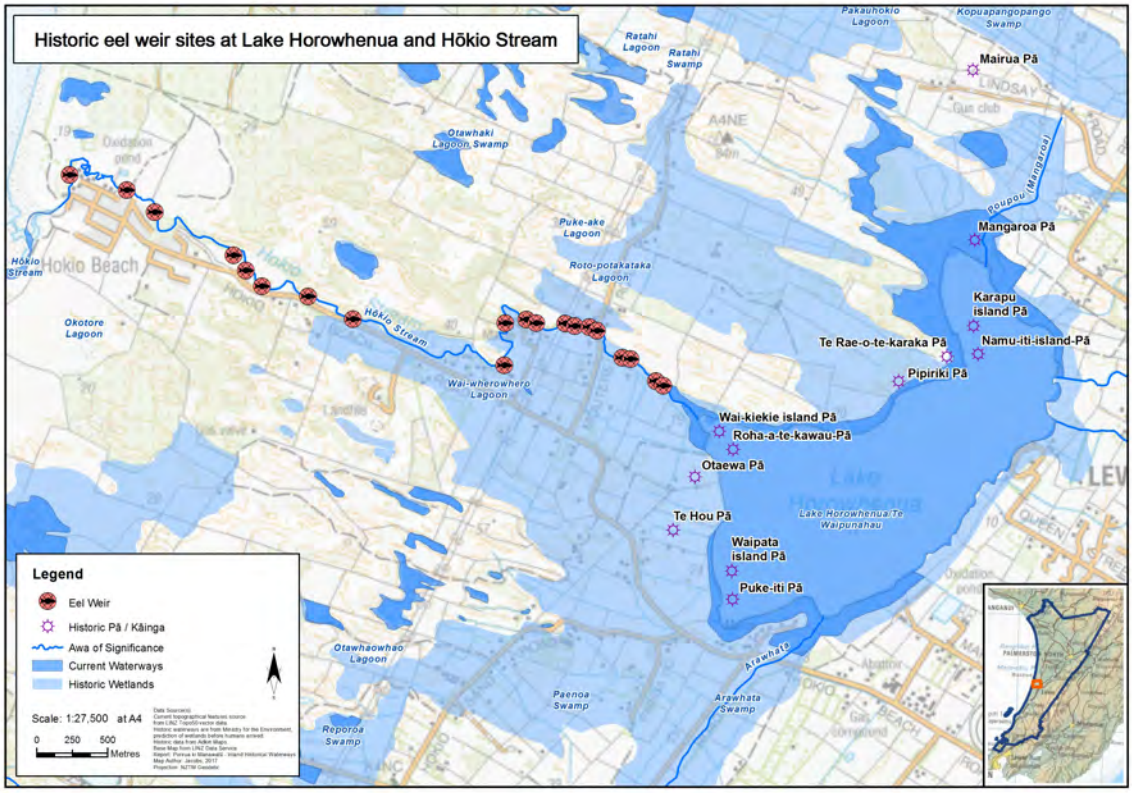
128 "Only tuna heke were caught, not non-tuna heke." Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage 4 June 2017.

129 McDonald and O'Donnell, p 45.

130 'Ruahine was a woman who had passed the age of child-bearing. This would indicate a recognition by the Māori that this eel had passed the natural breeding age', in McDonald and O'Donnell, p 46.

131 Note: "Ngāti Raukawa use both names 'Ruahine' and 'Tahimaro' to describe different types of eel. Tahimāro is a very large and long black eel. The Ruahine is a large stout eel." Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage 4 June 2017.

132 McDonald and O'Donnell, pp. 45-46.



Map 10: **Lake Horowhenua/Te Waipunahau with eel weir sites.**[133]

> 'Traditionally, hapū controlled the allocation of resources, the organisation of production, and the distribution of the products of Māori economic activity. Hapū groups and sometimes individuals had inheritable rights to the use of land and fishing sites, but these rights could not be alienated outside the iwi without the consent of the numerous hapū making up the iwi.'[134]

An ancient, large whakamate eel-trapping channel once connected Pakauhokio Lagoon through a sand-ridge to the neighbouring lagoon.[135] Whakamate were once a common practice by which are now only marked as archaeological sites if they are still visible at all. Te Kenehi Teira provided a Ngāti Raukawa perspective of this practise which was common throughout the district, from Muaūpoko, Rangitāne, and earlier iwi.[136] Cultural practices such as this have been legislated against and Crown and local government

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133 Created by Jacobs courtesy of Crown Forestry Rental Trust. Reproduction of Dreaver, 2006, inside cover.

134 Luke, p. 15.

135 North-west of Lake Horowhenua.

136 Interview with Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata, at Archives, Wellington, 12 October 2016, in Appendix V.

policies and practices have historically had detrimental impacts on Māori customary fishing practices and continue today. This is discussed further in Chapters 5 and 7.

A popular cooking method was raurekau tuna, with the bodies woven in raurekau[137] leaves and cooked directly over konga. As reminisced by Bobby Miratana along with Ngāti Wehi Wehi representatives:

> 'I remember Whetu when he was alive sitting just out there (points to the back of the marae) doing raurekau, they used to do them one at a time on the konga (hot embers of the fire)'.[138]

One of the major impacts on iwi and hapū in the inquiry district is that this taonga species appears much less frequently on marae tables, due to the pollution of waterways and the severe depletion of tuna populations which affects their ability to manaaki. Scenes of large racks of eels being prepared for smoking, such as the one in the following image are no longer a reality The state of this fishery as well as other species and associated impacts are discussed further in Part 2 of this report.

Figure 13: **Photo of Mrs Henry with an impressive rack of dried eels at the Raukawa Marae opening ceremony, taken by GL Adkin.[139]**

[137] *Coprosma grandifolia.*
[138] Interview with claimants from Ngāti Wehi Wehi at Ngāti Wehi Wehi Marae, Manakau, 9 September 2016, in Appendix V.

Kai species within the inland waterways, forests, and coastal region have all been greatly depleted in the inquiry district. The reduction in mahinga kai has caused a significant inter-generational loss of sustenance and depletion of cultural knowledge and practices. Hunting and fishing practices also kept Māori fit and healthy, and their fine physiques were noted by some early settlers. One early settler in the Wellington region wrote the following:

> 'They (Māori) are perfect models of the human species, and really are a splendid and superior race. They are intelligent, generous, faithful, open, and brave… they are honest and will, if you treat them properly, do you many little favours.'[140]

2.5.2 Marginalisation of the Māramataka Māori

Another knowledge system marginalised by colonialism has been the Māori lunar calendar or māramataka. They vary across iwi depending on where they live, their local climate and the availability of edible plants, birds, and fish life within their region.

> 'The named nights of the moon have similarities and differences between regions, where each night of a lunar month was named and described according to how favourable or unfavourable conditions were for fishing, eeling, harvesting or planting. The skill in calculating time by the moon included an acknowledgement of star movements and seasonal patterns that ascertained propitious times and weather conditions for these activities. The night skies were read for seasonal indicator stars and as practical guides for their cultural and philosophical significance. The named nights of the moon have similarities and differences between regions around the county too.'[141]

The Reverend Metara Te Ao-marere of Ōtaki offered his knowledge of the māramataka or Māori moon calendar to Elsdon Best, an early ethnographer at the Dominion Museum.[142] Although the named nights of the moon are considered Māori customary knowledge (and which might differ with regional dialects and place-based observations), the symbols

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139 Alexander Turnbull Library, reference: PAI-f-005.

140 AH Carman, 'The Settlement of Wellington', in *New Zealand's Heritage: The Making of a Nation*, Vol 1, Part 13, 1971, Auckland, p 343.

141 H Smith, He Māramatanga ki te Maramataka notes for Wai-o-papa exhibition, Adaptation Strategies to Address Climate Change Impacts on Coastal Māori Communities project at Victoria University Architecture Building, Wellington, unpublished paper, June 2016.

142 E Best, 'Fishing Methods and Devices of the Māori', in *Dominion Museum Bulletin* 12, 1929, pp 112.

provided with the key were invented in the 1800s. Each symbol represented a particular aspect of the night of the moon (see Figures 14 and 15 below). For instance, straight lines indicated good nights for line fishing, and black dots for fishing by torchlight. A night such as Whiro, with a dot and a line, was good for both.

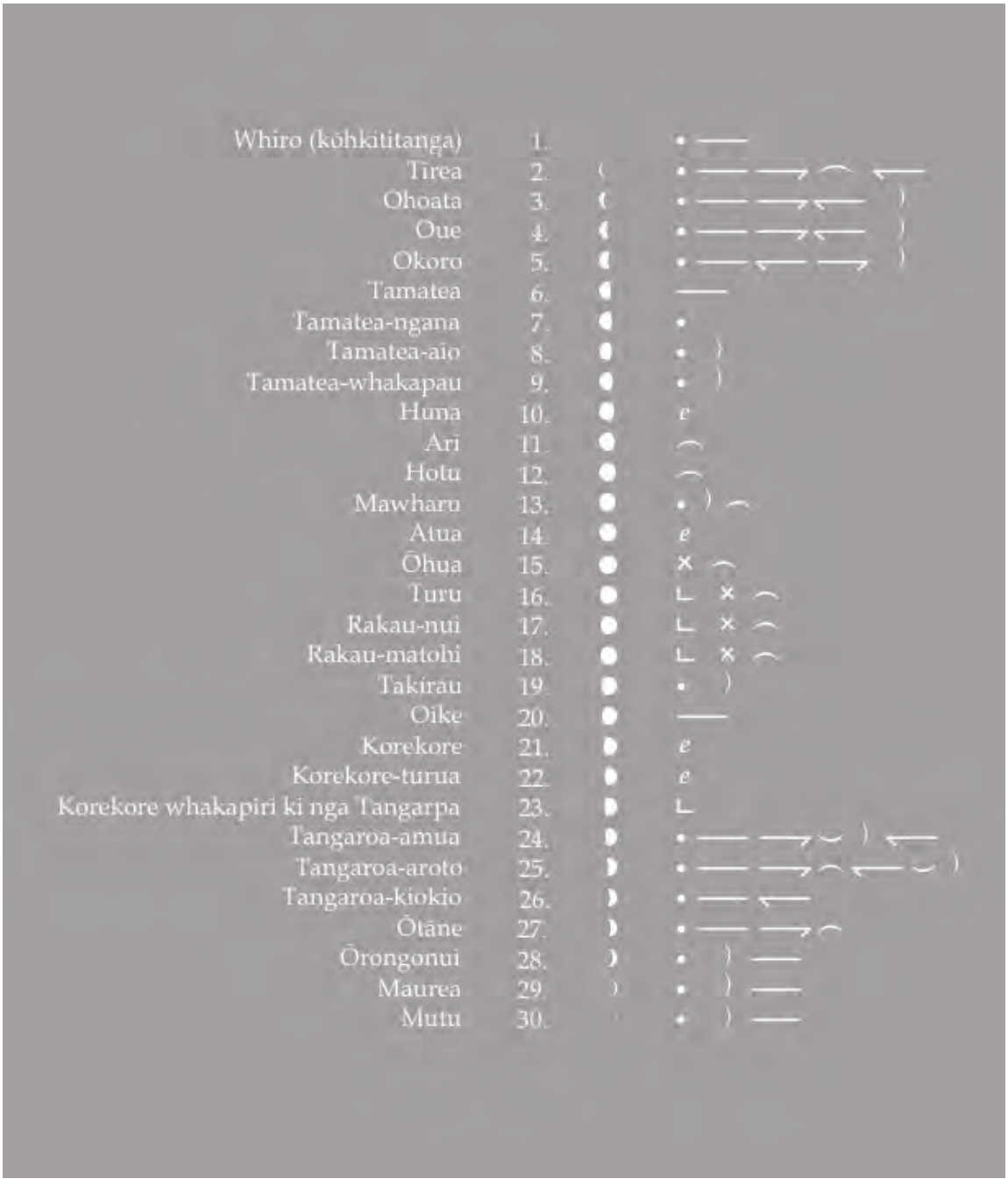

Figure 14: **Māramataka symbols with terms associated.**[143]

[143] H Smith, June 2016.

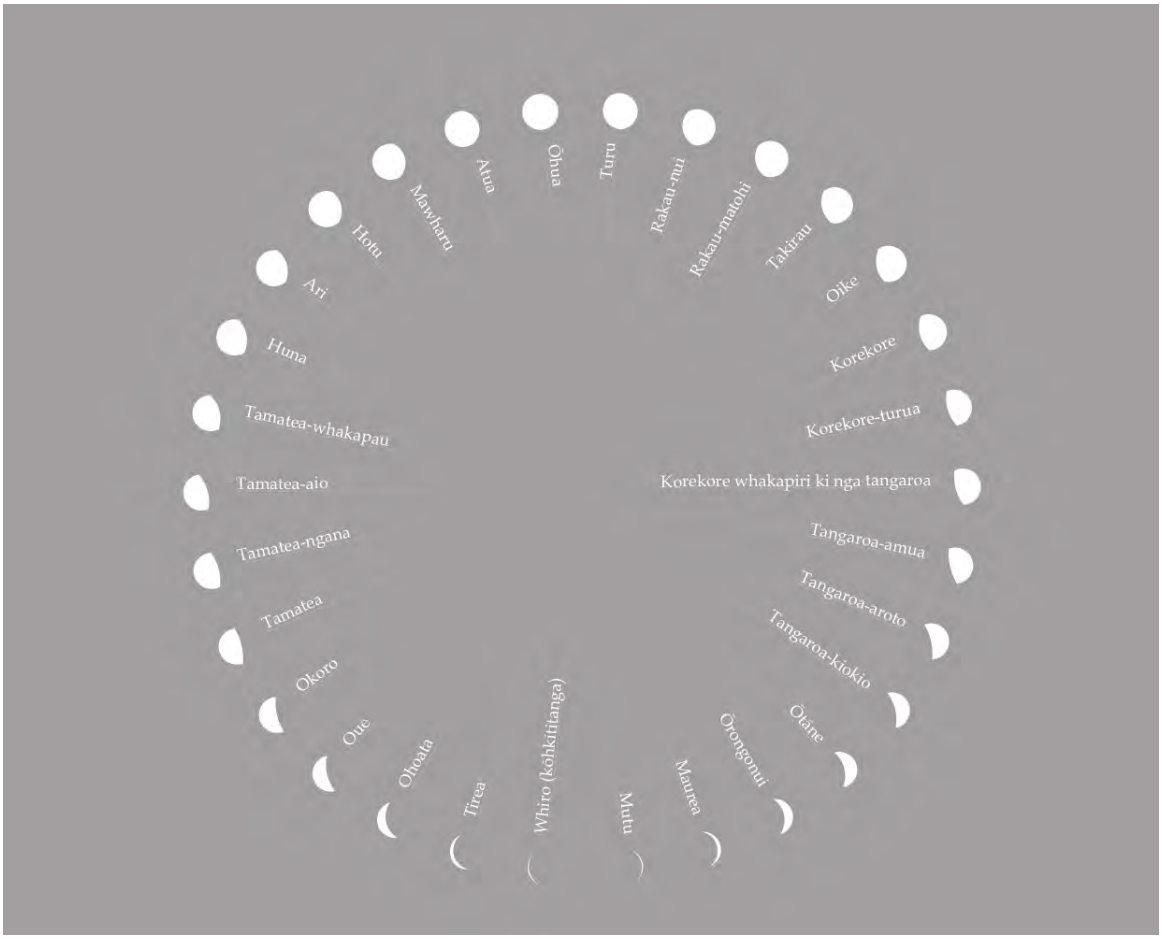

Figure 15: **Māramataka symbols in a circular pattern.**[144]

2.3 Issues of Ownership of Rivers

2.3.1 Rivers as Iwi Boundaries and Interconnection

In the Porirua ki Manawatū inquiry district it was common for iwi and hapū to, at times, mark their boundaries by rivers and streams. A relevant whakatauki used by Ngāti Raukawa provides an example of iwi defining their rohe:

Mai i Waitapu ki Rangataua

Miria Te Kakara ki Kukutauaki

(from the Rangitīkei River tributaries of Waitapu and Rangataua, to Kūkūtauākī Stream just north of Waikanae).

Te Rauparaha is said to have offered Te Whatanui the region between Ōtaki (River) and Rangitikei (River) during his visit to the region in 1826.[145] Te Whatanui returned to the

[144] E Best, 1929, pp 112.

Waikato region to gather his people and persuaded 800 to move to the Horowhenua region in about 1829-1830.[146]

Both male and female rangatira had the mana to set iwi boundaries. According to the late Wakahuia Carkeek, Waitohi (Te Rauparaha's sister) was pivotal in deciding iwi boundaries. In fact, Waitohi also used her mana to influence Te Āti Awa move to occupy the Waikanae area. As a rangatira of Ngāti Raukawa, she was also influential in persuading Ngāti Raukawa to move north to occupy the area between the Kūkūtauākī Stream (north of Waikanae) and the Manawatū River.[147] Rangi Topeora, Te Hitau, and other rangatira wahine informed and made decisions.[148]

Waterways also connected hapū and iwi for the sharing and trading of resources, and were often the setting of important events. For example, on the 1st of October 1864, Mr Baker at the Superintendent's Office in Poneke wrote to Hori Kingi and the chiefs of Putiki proposing a meeting of peace. He mentions that he will send white flags to fly. The request was for:

> 'Ngāti Raukawa and Rangitāne to meet on the north bank of the Manawatū River, 12 October and of Ngāti Apa to meet at Parewanui on 13 October.'[149]

A Gazette notice on 15 October 1903, p. 2190, includes a notice from the Minister of Public Works on 8 October 1903 to erect a bridge over the Ōhau River, on Main County Road, under authority of the Public Works Act 1894, and to apportion the cost of construction between the Horowhenua County Council and the Ōtaki Road Board, "Governor of the Colony of NZ, in pursuance and in exercise of the power and authority vested in me by the said Act, do hereby authorise the Horowhenua County Council to construct the said work...".[150]

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145 Foxton Historical Society, *Pioneers of Foxton*, Book One, p 3. Te Whatanui and the peace-making at Karikari presentation by Margaret Speirs, December 1988 and Reviewed July 1989. Attachment provided by personal communication, Heeni Collins, email 4 April 2016.

146 Foxton Historical Society, *Pioneers of Foxton*, Book One, p 3.

147 W Carkeek, 1966, p 24.

148 Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage 4 June 2017.

149 Colenso Letters, #23. Superintendent's Office, Poneke, 1 October 1864, p 90. CD provided by CFRT.

150 Gazette notice 15 October 1903, p. 2190, bridge over the Ōhau River, on Main County Road. Archives New Zealand, Wellington, R24007373, LS-W1 380, Record 19345/4, Horowhenua No. 6 Block.

2.3.2 The Coal Mines Amendment Act 1903

Enactment of the Coal Mines Amendment Act in 1903 granted the Crown ownership of all navigable rivers in New Zealand. The rangatiratanga of hapū and iwi within the inquiry over their rivers was further sidelined by this legislation. Under English common law, navigable rivers were deemed to be owned by the Crown to ensure public use access, including for transport and fishing. The rivers that were historically navigable in the inquiry district included the Manawatū River, the Ōhau River, the Waikawa River, the Ōtaki River, and the Waikanae River. Each of these had ports or wharves that were regularly visited by ships before the large earthquake in November 1848. After that time, the Manawatū River was the only one with a major port in which large ships were still able to dock.

Figure 19 below shows the busy Foxton Port on the Manawatū River in 1879. The painting also depicts Māori and European water vehicles with three large ships, a local paddle steamer, as well as a waka.[151]

Figure 16: **Painting of the Foxton Port in 1879 by Robert George Palmer.**[152]

The 1848 earthquake raised the coastline land level resulting in a reduction in the size of the mouths of the rivers listed above. Initially this provided a feast for local coastal iwi, but in at least one site on the Ōhau River mouth it was soon followed by famine due to

[151] C Knight, *New Zealand's Rivers: An Environmental History* (Christchurch: Canterbury University Press, 2016), p 57.
[152] Alexander Turnbull Library, Ref. C-030-014.

the impact on kaimoana beds and fish stocks.[153] This particular earthquake also separated the conjoined mouth of the Ōhau and Waikawa Rivers.

Map 11: **The Waikawa River and Ōhau River mouth historical movements.**[154]

[153] Personal communication, Sean Bennet-Ogden, Ngāti Tūkorehe, discussed Ōhau as an example, 20 November 2016.

[154] Created by Jacobs, courtesy of Crown Forestry Rental Trust.

The Coal Mines Amendment Act 1903 also introduced new ownership rights to non-navigable rivers and specifically referred to the *ad medium filum aquae* (to the centre line of the water) presumption on inland waterways.[155] This reinforced the presumption that the holders of riparian land titles to also own the beds of rivers and lakes to their centre line. The *ad medium filum aquae* rule applies to land owners where their property abuts an inland waterway and where a legal road or other form of public land does not interrupt connection. As nearly all Māori land bordered waterways, they also had *ad medium filum aquae* rights. Searchers of historical records for this chapter found little to no evidence to indicate that the Crown extensively explained the principles of the *ad medium filum aquae* rule to iwi and hapū in the inquiry district, or sought their consent, before they enforced them.

The image below of the Manawatū River at the request of Tū Te Manawaroa was produced to show the historic and current waterway changes affecting Māori ownership issues of river beds over time. Unfortunately, it appears that a majority of the land adjoining the changing meandering bends of this river is no longer in Māori ownership. One parcel at the top of this image shows the Māori owners lost and gained land. Another parcel near Taita Lagoon shows that the Māori owners could apply for further land as the current river bank has moved away in the opposite direction. The most telling aspect of the map is that iwi and hapū have been divested of their ownership of the river. One of the larger Māori owned parcels is of what is now referred to as Matakarapa Island; the current location of sewage treatment oxidation ponds. This is discussed in detail in Chapter 5. The Reserves and Other Lands Disposal Act 1965 also brought about a failure to protect accretion to Papangaio J Block at the mouth of the Manawatū River at Foxton. That lead to the subsequent further loss of land to Māori. This was a landmark case during the 1960s.[156]

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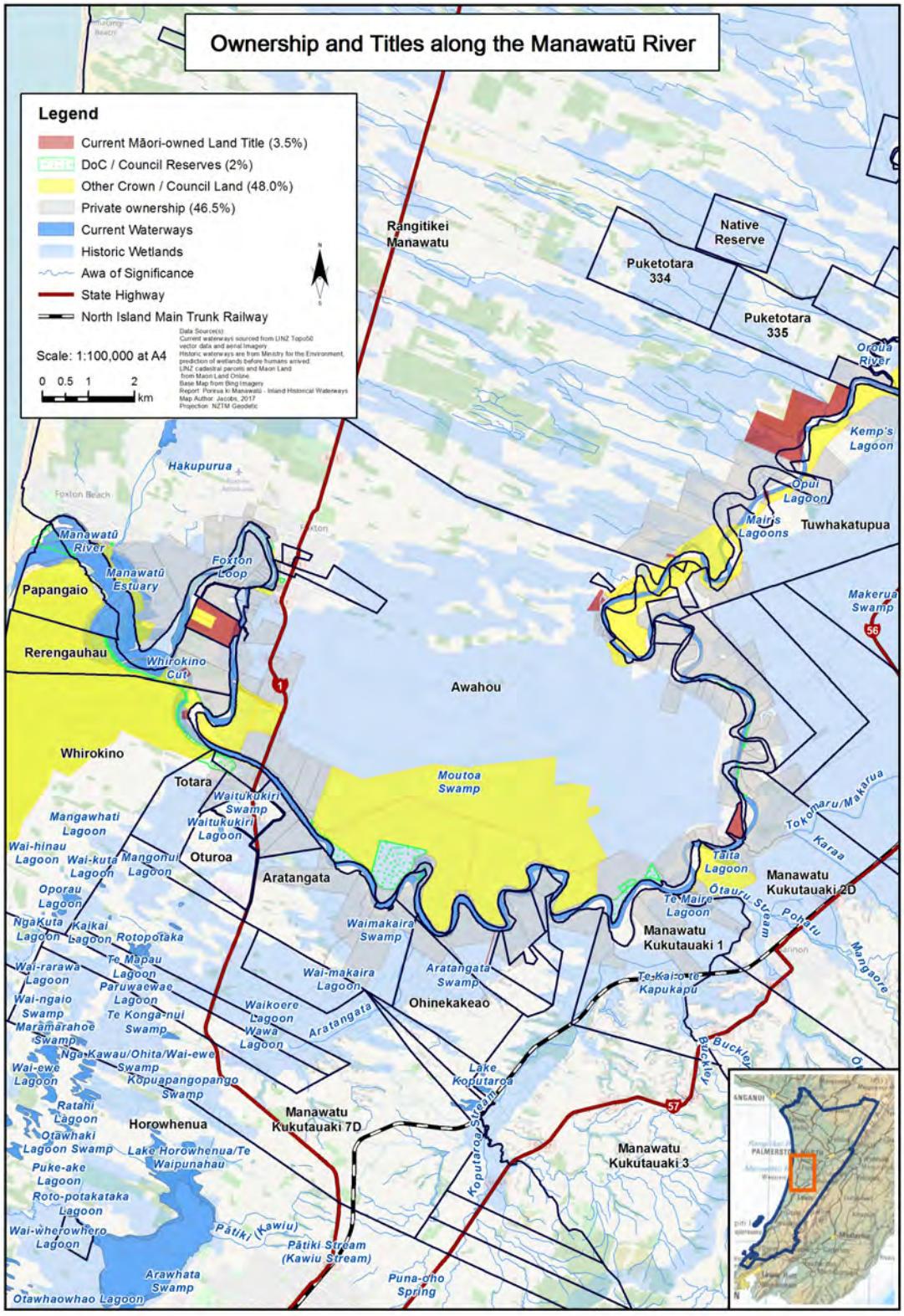
155 The *ad medium filum aquae* presumption was introduced with the English common law presumption from 1840 and indirectly received statutory recognition in the English Laws Act 1858. Personal communication, David Alexander, appraisal received during the Draft Report feedback stage. Received via email from Nicola Kiri-Smith, Crown Forestry Rental Trust 5 July 2017.

156 Personal communication, David Alexander, appraisal received during the Draft Report feedback stage. Received via email from Nicola Kiri-Smith, Crown Forestry Rental Trust 5 July 2017.



Map 12: **Ownership of the Manawatū River in 2017.**[157]

[157] Created by Jacobs, courtesy of the Crown Forestry Rental Trust.

In evidence to support the Tuhoe Wai Claim 884, Suzanne Doig produced a paper *Te Urewera Waterways and Freshwater Fisheries* and in it she commented that:

> 'there was no clear process laid down to decide which rivers were navigable, each government department and local authority responsible for river matters made that decision on a day-to-day basis.'[158]

Doig highlighted in her thorough research that some departments were cautious in defining 'navigable' given that broad definitions could impinge on Māori as well as other riparian owners' rights and other departments did not appear to have considered Te Tiriti o Waitangi or property rights at all when making their decisions.

She also stated that:

> 'Crown agencies or local authorities ruled that the Crown owned parts of the riverbed because the river was navigable or through *ad medium filum*, it meant that the Crown could exercise ownership rights such as the right to sell gravel from the riverbed.'[159]

In this inquiry district as with Te Urewera, there are cases where gravel was taken from the riverbeds adjoining Māori land but the royalties were paid to Crown authorities. It again demonstrates the historic failure of the Crown to recognise and protect the rights of iwi and hapū. The issue of gravel extraction is reported on in detail in chapter 3.

Under the *ad medium filum aquae* rule, Ngāti Huia ki Katihiku have retained ownership of half the river bed at the Ōtaki River mouth.[160] Ngāti Tūkorehe also still own half of the Ōhau River in places in the lower reach.[161] In one area the iwi farm trust Tahamata Incorporated owns both sides of the Ōhau River and thus owns the entire river bed at that section (see Map 8 in 2.3.2).

Ngāti Kauwhata continue to assert an unbroken ownership claim to their ancestral awa, the Oroua River. Sir Taihākurei Durie of Ngāti Kauwhata states this very clearly in following paragraph:

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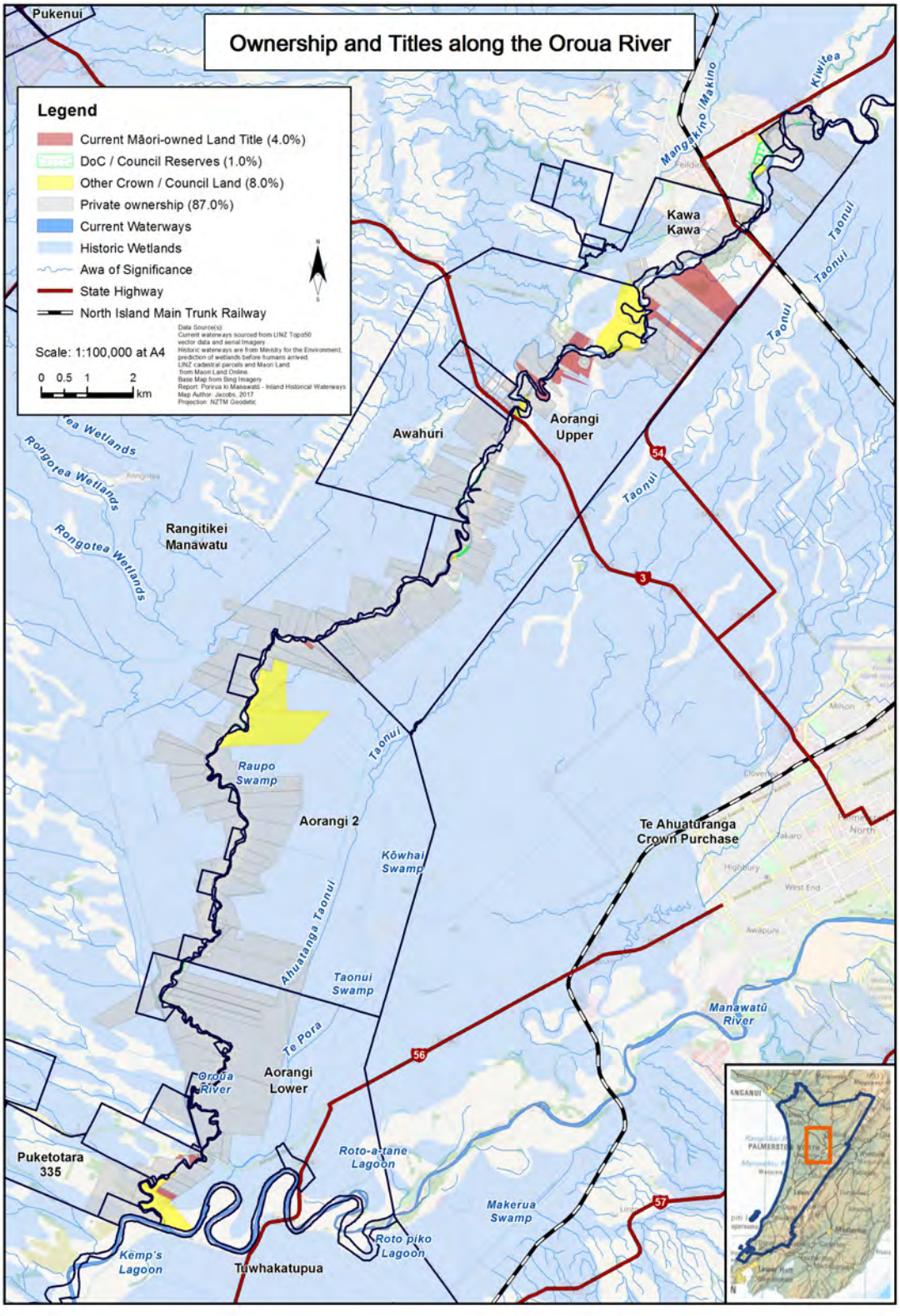
158 S Doig, Te Urewera Waterways and Freshwater Fisheries, Wai 894 #F6, Brief of Evidence.
159 Doig, p. 6.
160 Personal communication, Te Waari Careek, IWCP Interview 1 June 2016.
161 Personal communication, Lindsay Poutama, Ngāti Tūkorehe Treaty Research Hui, Tūkorehe Marae, May 2016.

‘In relation to Oroua, Ngāti Kauwhata claims that they owned it, that they have never alienated it and still own it, that the alienation of the riparian land did not affect their ownership of the river, that the Crown has never extinguished those rights by a consensual Treaty process. That they are now in a position of having to appear before local authorities about resource consents for the river as though their interest was merely cultural and when those concerned have no knowledge of their interest and may have commercial interests that are hostile to them.’[162]

[162] Personal communication, Sir Taihākurei (Eddie) Durie, 22 November 2016.



Map 13: **Ownership of the Oroua River in 2017.**[163]

[163] Created by Jacobs, courtesy of the Crown Forestry Rental Trust.

The Gold Fields Act 1866 and Coalmines Amendment Act 1903 greatly impacted upon other rivers and streams in New Zealand that showed promise for goldmining and other mineral extraction industries. Gold, silver and other precious metals were not prominent elements extracted from waterways in the inquiry district, although prospectors did find traces of gold and copper in the lower valleys of the Tararua ranges in the 1860s. In 1863, J.C. Crawfold a well-known gold-seeker engaged Manahi, the ferryman on the Ōtaki River, to accompany and guide him up the Ōtaki Gorge. Their exploits did not uncover any substantial bounty. In 1887-8 the government surveyor Alexander McKay also confirmed no minerals of commercial value in the region.[164]

The historical records research did not locate any substantial impacts on iwi from the creation of mineral extraction industries and its empowering legislation. Nor was any particular reference made on the issue by participants during the wānanga and interview process for the inland waterways cultural perspectives project. Instead, the main extraction industry from rivers in the inquiry district has been gravel operations. The dredging of river banks and beds has removed vast amounts of gravel which has contributed to the destruction of fisheries habitats, and there has been an ongoing failure by the Crown to compensate iwi for the gravel taken. As noted earlier, the issue of gravel extraction is detailed in the following chapter.

The various Public Works Acts and associated processes were another prominent way that Crown and local bodies were able to rob Māori of lands alongside rivers as well as resources such as gravel and shingle. Two examples are used here to illustrate the point and further examples are mentioned throughout this report. A CFRT commissioned report written by Suzanne Woodley for this inquiry district is dedicated to this subject.[165]

A Gazette notice on 15 October 1903, p 2190, includes a notice from the Minister of Public Works on 8 October 1903 to erect a bridge over the Ōhau River, on Main County Road, under authority of the Public Works Act 1894, and to apportion the cost of construction between the Horowhenua County Council and the Ōtaki Road Board, 'Governor of the Colony of NZ, in pursuance and in exercise of the power and authority

[164] A Dreaver, *An Eye for Country: The Life and Work of Leslie Adkin* (Wellington: Victoria University Press, 1997), p 66.
[165] S. Woodley. Forthcoming.

vested in me by the said Act, do hereby authorise the Horowhenua County Council to construct the said work....'[166]

The Ōtaki River between State Highway 1 and the sea, plus riparian land alongside that part of the river, was taken for soil conservation and river control purposes under the Public Works Act in 1954-55,[167] then set apart for soil conservation reserve.[168] This was a major land acquisition by the Crown discussed in the following chapter.[169]

In 2009, Jacinta Ruru, Ngāti Raukawa ki Waikato, wrote a literature review *The Legal Voice of Māori in Freshwater* Governance for Landcare Research Manaaki Whenua.[170] In the report she considered how a New Zealand court might decide on native title claims to specific rivers. Ruru pointed out that New Zealand courts have accepted a similar stance to Canada in that a "doctrine of native title encompasses a spectrum" which indicates a potential to include "exclusive use and occupation" of rivers.[171] Even though the possibility may exist within the legal system, and even if an iwi was successful in gaining native title to a river, she implied it is unlikely the Crown would award iwi ownership of it.[172]

2.3.3 Case Study One: Waikanae River

With the advent of the Native Land Court in 1865 and the individualization of land titles, Wi Parata, a rangatira of Ngātiawa and Ngāti Toa Rangatira descent, had become a major land holder on the Kāpiti Coast.[173] He also became the first Māori member of Cabinet following his election as the Member of Parliament for Western Māori in 1871, a position he held until 1876.[174] In September of 1865, Wi Parata wrote to the Native Minister, Sir Donald McLean:[175]

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166 Gazette notice 15 October 1903, p. 2190, bridge over the Ōhau River, on Main County Road. Archives New Zealand, Wellington, R24007373, LS-W1 380, Record 19345/4, Horowhenua No. 6 Block.
167 NZ Gazette 1954 p. 1657 & NZ Gazette 1955 p. 274.
168 NZ Gazette 1955 p. 920 & NZ Gazette 1956 p. 369.
169 Personal communication, David Alexander, appraisal received during the Draft Report feedback stage. Received via email from Nicola Kiri-Smith, Crown Forestry Rental Trust 5 July 2017.
170 J Ruru, *The Legal Voice of Māori in Freshwater Governance: A Literature Review*, report prepared for Landcare Research New Zealand Limited, 2009.
171 Ibid, p 84.
172 Ibid, pp 84-85.
173 Maclean and Maclean, pp 49 & 59.
174 Ibid, pp 57& 59.
175 Alexander Turnbull Library, MS-Papers-0032-0696F-07. Inward letters in Māori. Sep-Oct 1871. McLean, Donald (Sir), 1820-1877 (MS-Group-1551).

Whare Paremete, Poneke
28 Hepetema 1871

Ki te Minita mo nga Māori

E hoa,
He aha i roa ai to whakaaro mo ta taua whakarite i te tikanga mo nga whenua rahui, i panuitia nei e au kia tonoa atu nga tangata o Porirua kia haere mai? Whakaritea tetehi ra e koe.

Na Wi Parata

English translation:

House of Parliament, Port Nicholson
28 September 1871

To the Native Minister

Friend,
Why are you delaying your planning for our arrangement over the regulation for reserved lands that I notified so that the Porirua people could come here? Arrange a day for it.

From Wi Parata

Despite the stipulations of 1884, in 1887 the Native Land Court awarded the application to subdivide the Ngarara Block, which ran from the Tararua ranges along each side of the Waikanae River, to Ngāti Toa Rangatira.[176] Members of Ngātiawa blamed Wi Parata for the subdivision and petitioned Parliament and the Native Affairs Committee that he had used his previous position and connections to influence decisions.[177] Although Wi Parata was cleared of 'a serious miscarriage of justice' the subdivision allocation was reheard by the Native Land Court. The Ngarara case took a further four years and during that time most of the witnesses were Māori, including a number of influential Māori women such as Jane Brown, daughter of Kahe Te Rau O Te Rangi, and her sister Mere Pomare. Other witnesses included the missionary Octavius Hadfield.[178] In 1891, the court made its final

[176] Maclean and Maclean, p 53.
[177] Ibid, pp 52-53.
[178] Ibid.

decision and it allocated 10,000 acres to Wi Parata (about 30 per cent) and the remainder to a large number of others, including Te Āti Awa (Ngātiawa) claimants.[179]

As an important aside, in 1877, a decade after the Native Land Court was established, Wi Parata took The Bishop of Wellington to the Supreme Court over a block of land in the Porirua Harbour. Te Rauparaha and seven other chiefs had given 500 acres to Bishop Selwyn in 1848 to build a school – but which was never built. The descendants, represented by Parata, wished the land to be returned to them. The case was one of the first in the country to reference the Treaty of Waitangi, and the judgement that followed became "notorious as a high-water mark of colonial racism".[180] In it, Chief Justice Prendergast commented that the Treaty document was 'a simple nullity'.[181] He dismissed the case reasoning that no political body existed to acquit the new Government sovereignty because Māori were "primitive barbarians".[182]

> 'On the cession of territory by one civilized power to another, the rights of private property are invariably respected, and the old law of the country is administered, to such extent as may be necessary, by the Courts of the new sovereign… But in the case of primitive barbarians, the supreme executive Government must acquit itself, as best it may, of its obligation to respect native proprietary rights, and of necessity must be the sole arbiter of its own justice. Its acts in this particular cannot be examined or called in question by any tribunal, because there exist no known principles whereon a regular adjudication can be based.'[183]

Indeed, up until the 1980s this ruling effectively dominated with the Crown routinely failing to recognise and uphold Māori customary rights and interests as guaranteed in Te Tiriti o Waitangi.

Turning back to the Ngarara Block case, it led the way for numerous sales of Māori land in the vicinity of what was known as Parata Township. The town had been established in 1895 following passage of the Native Townships Act 1895. The Act provided for native reserves to be set aside for Māori houses and burial grounds (although no greater than 20

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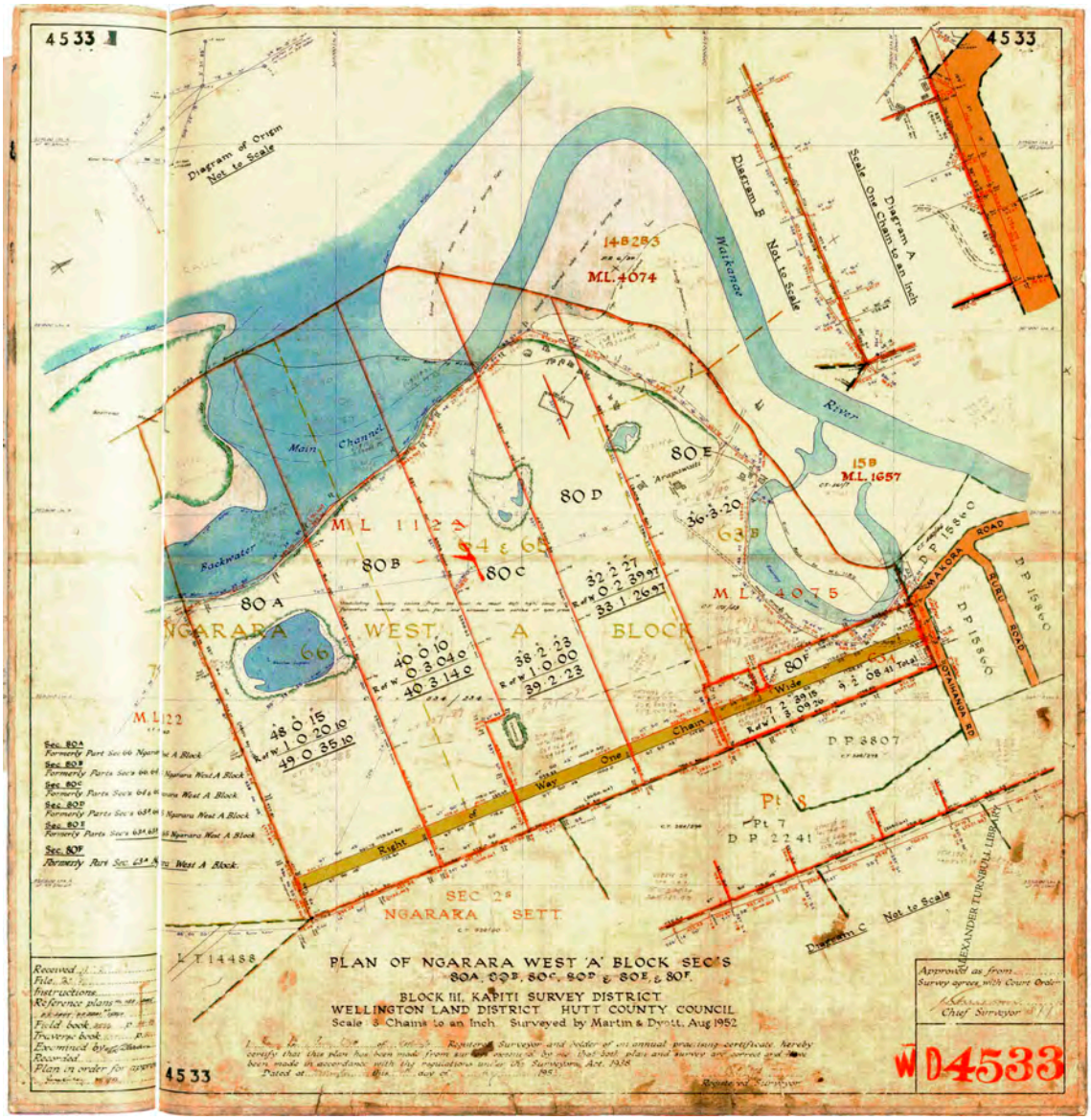
179 Ibid.
180 Ibid, p 59.
181 Wi Parata v The Bishop of Wellington, 1877, 3 N.Z. Jur. (NS) 72, p. 78, in Mikaere, 2014, p 2.
182 Ruru, 2009, p 76.
183 Wi Parata v The Bishop of Wellington, 1877, 3 N.Z. Jur. (NS) 72, p. 78, in ibid, p 76.

per cent of the township area) and was designed to speed up the settlement process.[184] Innovative early Māori town planning saw the leasing of land to Europeans on the eastern side of the railway perhaps as a deliberate act to preserve Māori independence.[185] At the turn of the century, the sale of Māori land in the area was on the rise.

In reference to the property of Wi Parata on the Waikanae River, archival records give further evidence of Crown mechanisms that reduced Māori ownership surrounding inland waterways in the inquiry district. In a letter dated 15 December 1903 from the Chief Surveyor to the Horowhenua County Council, reference is made to a portion of the road taken by Governor's warrants Sections 93, 94, 95, Native Land Act 1886, which conferred power to take roads 'through native land up to 5% for 15 years'.[186]

Wi Parata passed away in 1906, and as the land in Māori ownership continued to diminish, so too did the name 'Parata Township' with the area becoming known as Waikanae.[187]

184 Maclean and Maclean, p. 57.
185 Ibid.
186 Letter dated 15 December 1903 from the Chief Surveyor to the Horowhenua County Council re Wi Parata's property in Waikanae river. Archives New Zealand, Wellington, R24007373, LS-W1 380, Record 19345/4, Horowhenua No. 6 Block.
187 Ibid, pp. 61 & 63.



Map 14: **Māori land map drawn in 1952 showing the encroachment of town planning to reclaim an area of the river mouth and sand flats and turn it into private lands.**[188]

The following example illustrates the Crown processes and subsequent local bodies that acquired the ownership of a section along the Waikanae River bed from Māori owners in the 1960s. The Crown records at Archives New Zealand showed the Māori Land Court proceedings were then endured by the owners to compensate them for the land and gravel taken. Significant in this example is that the Māori owners also recieved royalties from the Waikanae Shilling Company.

The land in question was situated in Block IX, Kaitawa Survey District as part of the Ngarara West A3c appeared in the NZ Gazette 26 April 1962.[189] The 8 acres 2 roods 11

[188] Ibid, pp. 192-193.

perches was acquired by the Governor-General of New Zealand, taken through proclamation pursuant to the Public Works Act 1928 for soil conservation and river control purposes. The land was then vested in the Manawatū Catchment Board as of 30 April 1962. The gazette notice like so many others was signed of as:

> 'Given under the hand of His Excellency the Governor-General, and issued under the Seal of New Zealand, this 11th day of April 1962.
>
> W.S. GOOSMAN, Minister of Works.
>
> GOD SAVE THE QUEEN!'[190]

The Secretary of the Manawatū Catchment Board wrote to the District Commissioner of Works at the Ministry of Works on 14 June 1962 in relation to the Waikanae River Scheme – Acquisition of Land.[191] He wrote that:

> 'On the 22nd June, 1960, the Soil Conservation & Rivers Control Council gave approval to this Board to acquire all the river bed at reasonable prices, their reference 96/315000. A number of pieces were transferred to the Board for the consideration of one shilling, but the area shown on the attached proclamation is Māori Land required by the Board and is thus to be taken by Proclamation. I should be pleased if you could enter into negotiations via the Māori Land Court for compensation to be paid to the Māori owners. As far as I know the Māori owners are Mrs. H. Jenkins and seven others, and Messrs. Phillips, Hollings and Shayle-George, Barristers and Solicitors, Raumati Beach, act for those owners. The area of land in question adjoins the area vested with the Board and on which the Waikanae Shingle Company have their shingle plant.'

The Ministry of Works Land Purchase Officer wrote to the Valuation Department on 12 October 1962 to ensure an application to the Māori Land Court was made for assessment

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189 NZ Gazette, 26 April 1962, No. 27, p 663. Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim: Māori Owners, 1962-1965. Archives New Zealand, Reference: R2 246 667.

190 Ibid.

191 Manawatū Catchment Board Secretary, A.T. Brown Letter 14 June 1962. Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim: Māori Owners, 1962-1965. Archives New Zealand, Reference: R2 246 667.

with a special valuation of this land based on market value for compensation.[192] The Secretary of the Manawatū Catchment Board then sent a letter 12 November 1962 to the Commissioner of Works at the Ministry of Works requesting the assessment of compensation to be made available to them as soon as possible 'to ensure that full details are known of this Board's valuation and defence well before the the [Māori Land Court] hearing.'[193] A proportion of the Māori owners then adjoined the Māori Land Court proceeding through solicitors requesting the Manawatū Catchment Board divulge the method of calculating the land value in question also stating the 'small area of land which includes the bed of the Waikanae Stream from which a more or less constant supply of shingle is obtainable.'[194] The Valuation Department, Urban Valuation Report dated 27 May 1963 then provided a summary valuation of £215 with a general comment that noted:

> 'the subject land has in part been used for river protective work by the removal of 10094 cubic yeards of metal for which a royaltof 9d a cubic yard is to be paid to the owners.'[195]

The Ministry of Works Land Purchase Officer informed the Manawatū Catchment Board, owners, and solicitors of the value based of market rates of the time.[196] Crown records then show that the Land Purchase Officer and District Land Purchase Officer then wrote to the Manawatū Catchment Board and Māori owners on the 1 August 1963 that:

> 'both valuers valued the land without taking metal potential into account and it was agreed in the Court that the sum of £225 would be reasonable. However, it was shown that there was some value in the metal on the site. 10,094 yards of

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192 Ministry of Works Land Purchasing Officer E.L. Staples 12 October 1962. Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim: Māori Owners, 1962-1965. Archives New Zealand, Reference: R2 246 667.

193 Manawatū Catchment Board Secretary, A.T. Brown Letter 12 November 1962. Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim: Māori Owners, 1962-1965. Archives New Zealand, Reference: R2 246 667.

194 Blenkhorn Todd and Whitehouse Barristers and Solicitors Letter 2 April 1963. Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim: Māori Owners, 1962-1965. Archives New Zealand, Reference: R2 246 667.

195 Ministry of Works Valuation Department, Urban Valuation and Report by District Valuer D.A. Howe, 27 May 1963. Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim: Māori Owners, 1962-1965. Archives New Zealand, Reference: R2 246 667.

196 Ministry of Works Land Purchase Officer E.L. Staples Letter 27 June 1963. Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim: Māori Owners, 1962-1965. Archives New Zealand, Reference: R2 246 667.

> metal were removed just prior to the proclamation by the Waikanae Shingle Co. with permission of the Catchment Board and by arrangement with the Māori owners to pay 9d per yard royalty. The plant of this Shingle Co. is sited on adjoining land. The sum of £378.10.6 has been held by the Shingle co. pending settlement of compensation and the included in its order that this amount be paid in to the Māori Trustee for payment to the Māori owners. The Board's Engineer made a statement to the Court that a further 5,000 yards of metal would be removed from this land but assured the Court that due to the works necessary to control the Waikanae River, metal would not accumulate on this land in the future. It would appear that the Court award is based on the valuation as agreed upon plus an allowance for the value of 5,000 yards still to be removed and under the circumstances is considered reasonable. No interest was allowed. I recommend that approval be obtained to the payment of the sum of £480.16.0 being the award of £450 plus £450 plus £21 legal costs and £9.16.0 witness expenses as compensation for the above land in accordance with the decision of the Māori Land Court dated 24 July 1963.'[197]

The Māori Land Court proceedings included a statement made by the court that:

> 'There can be no doubt that the land will produce shingle but it is impossible to say how much. The engineer feels that the Waikanae Shingle Co[mpan]y has dug such a deep ditch that at the time of taking there was only the 5,000 yds... worth some £250... The Catchment Board receives at the moment some £1,000 a year in royalty shows that not only much shingle comes down but also that there is a good demand for it.'[198] It was at that stage that the Co[mpan]y started getting metal off Māori land. They take 20,000 yds a year so far as my memory goes. i.e. £1,000 a year.'[199]

The initial shilling value for lands along the Waikanae River being acquired by the Manawatū Catchment Board for the purposes of Soil and Protection work resulted in

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[197] Ministry of Works Land Purchase Officer and District Land Purchase Officer Letter 1 August 1963. Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim: Māori Owners, 1962-1965. Archives New Zealand, Reference: R2 246 667.

[198] Extract from Ōtaki Minute Book 70 Folios 179-184, Levin, 24 July 1963, p 2. Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim: Māori Owners, 1962-1965. Archives New Zealand, Reference: R2 246 667.

[199] Ibid, p 3.

compensation of £480.16.0 to the Māori owners with solicitor engagement. Just over a year later, after the land was acquired through Gazette Notice, the Manawatū Catchment Board paid compensation for the land and gravel to the Māori Trustee for distribution to the Māori owners (of Block IX, Kaitawa Survey District as part of the Ngarara West A3c). Notably the total amount the owners recieved which included a royalty was significantly less than the annual royalty of £1,000 the Manawatū Catchment Board was recieving.

The following correspondence is another prime example of the Crown's role in giving approval to Catchment Boards to take Māori land for soil conservation and/or river control purposes and to grant compensation for such. Furthermore, this Waikanae River case demonstrates the lesser compensation approved for payment to Māori land owners upon the taking of such land, than the valuation gained by the Department of Māori Affairs, and the role of outstanding rates charges in such compensation decision-making.

On 5 February 1968, the District Officer of the Department of Māori and Island Affairs and Māori Trust Office wrote to the District Commissioner of Works, Ministry of Works, specifying that:

> 'the Māori Trustee had a valuation made with Mr J. Flowers... to arrive at a settlement [of:]
>
> A22A1 – Land $60 – Water Rights $140 – Total $200.00
>
> A22A2 – Land $160 – Water Rights $140 – Total $300.00
>
> Costs $35.70
>
> $535.70
>
> ... In addition, the District Officer recommended the writing off of rates of $10.41 plus costs $1 on 22A1, and $8.68 plus costs $1 on 22A2.'[200]

Subsequent correspondence from the Commissioner of Works to the Manawatū Catchment Board regarding the 'Land Purchase Officer's report and recommendation of

[200] Correspondence dated 5 February 1968, from the District Officer of the Department of Māori and Island Affairs and Māori Trust Office to the District Commissioner of Works, Ministry of Works. Archives New Zealand, Wellington, R2246677 Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim Māori Owners Palmerston North, Reference AATE W3392 Box 76 Record 96/315000/0/13.

25 March 1969 which was approved by the Chairman of the Soil Conservation and Rivers Control Council on 30 April 1969',[201] is a prime example of the way in which the Crown made recommendations and approved land purchases for 'river control' purposes. It details 'recommendations in respect of the Māori -owned blocks described as parts Ngarara West A22A1 and A2',[202] and 'the necessary approval' from the District Commissioner of Works for the Attention of the Chief Land Purchase Officer.[203]

In a memo of 25 March 1969 from the Resident Engineer of the Ministry of Works to the District Commissioner of Works, the Manawatū Catchment Board was given approval to grant:

> 'compensation for land taken for Soil Conservation River Control purposes... with Māori owners... in Block IX Kaitawa Survey District... vested in the Manawatū Catchment Board. [It was] shown as a reserve for River Control purposes on Horowhenua County Operative District Scheme, with an underlying Residential zoning... The land in the owner's title is shown as bounded by the Waikanae River, and prior to entry being made this small farmlet had access to the river... The taking of the above land, and the erection of a fence on the new boundary by the Catchment Board in 1957, has cut off practical and legal access to the river and the owner is therefore entitled to a contribution towards the cost of an alternative water supply. The Māori Trustee has offered to accept $320.00 in full settlement on condition that the Manawatū Catchment Board writes off $9.68 in rates in respect of which the Board has a Charging Order against the property. The proposed settlement comprises $120.00 for land, $40.00 for injurious effect to a small portion of the owner's property which now lies between the new stop bank

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201 Correspondence from the Commissioner of Works to the Manawatū Catchment Board regarding the Land Purchase Officer's report and recommendation of 25 March 1969 which was approved by the Chairman of the Soil Conservation and Rivers Control Council on 30 April 1969. Archives New Zealand, Wellington, R2246677 Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim Māori Owners Palmerston North, Reference AATE W3392 Box 76 Record 96/315000/0/13.

202 Letter from the District Commissioner of Works to the Manawatū Catchment Board on 25 March 1969. Archives New Zealand, Wellington, R2246677 Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim Māori Owners Palmerston North, Reference AATE W3392 Box 76 Record 96/315000/0/13.

203 Correspondence from the District Commissioner of Works for the Attention of the Chief Land Purchase Officer, regarding required approval. Archives New Zealand, Wellington, R2246677 Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim Māori Owners Palmerston North, Reference AATE W3392 Box 76 Record 96/315000/0/13.

> and the boundary of the land taken, and which has been rendered useless, contribution to alternative water supply $140.00 and $20.00 costs. No interest is claimed... [The Senior Land Purchasing Officer] recommend that approval be obtained to the payment of $320.00 in full settlement for the taking of the above land for Soil Conservation and River Control purposes on condition that the Catchment Board writes off the amount of $9.68 for rates' [204].

The above memo was subsequently recommended for approval from the chairman of the Soil Conservation and Rivers Control Council. Thus, the compensation that was finally approved to be paid to the Māori land owner was less than their valuer had specified, did not include costs, and the write off of rates amounts owed was also less.

Further to this, a number of a wāhi tapu were desecrated within the Ngarara block by urban development outlined by Rawhiti Higgott in his report to the Wellington Regional Council in 1993.[205] The Waikanae River itself was identified as significant to iwi and many historical sites of cultural significance were situated on its banks, such as Waimeha Pa, Arapawaiti, Kaitoenga, Peka Peka, Pukekawa, Ngahuruhuru, Te Rere, Taewapaharahara, and Kuititanga.[206] One example at the mouth of the Waikanae River was the Waimeha burial ground:

> 'This burial ground lay near the old Waimeha Pā which was situated at the mouth of the Waikanae River. Eruini Te Marau refers to it as a burial ground where among others his mother was buried. Waimeha is also referred to as a burial ground by Hira Maika who said that Waipuhanau was buried there. She was the mother of Wi Parata Te Kakakura Waipunahau, Paramount Chief of Ati Awa. This … has since been developed into residential blocks and very little evidence has been left of it being a burial ground.'[207]

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[204] Memo of 25 March 1969 from the Resident Engineer of the Ministry of Works to the District Commissioner of Works. Archives New Zealand, Wellington, R2246677, Soil Conservation/River Control – Manawatū Catchment Board – Waikanae River – Claim Māori Owners Palmerston North, Reference AATE W3392 Box 76 Record 96/315000/0/13.

[205] R Higgott, Ati Awa ki Whakarongotai Response to Wellington Regional Council Contract Entitled: Waikanae River Floodplain Management Plan, Phase 1, Tikanga Māori, Waikanae (Wellington Regional Council, Wellington) 1993.

[206] Ibid, pp. 5-6.

[207] Ibid, p. 4.

Very little of the Ngarara block remains in Māori ownership today (see Map 9 in 2.3.2). Waikanae is now considered by Te Āti Awa iwi members as an expensive place for them to live and own a home. Kiri Parata presented on this topic at the Whakauae Research for Māori Health and Development Symposium on the 5th August 2015 at Rata Marae.[208] She talked of how whānau who wish to return home now find it hard to buy near their marae, Whakarongotai.[209]

2.4 Issues of Ownership of Lakes

The Kāpiti-Horowhenua coastline has a number of dune lakes and numerous lagoons that are all sites of significance to hapū and iwi in the inquiry district. As with rivers, these highly valued lakes and lagoons were ideal sites for Māori settlement that included pā and the seasonal papakāinga – both alongside them and in the lakes themselves (see Appendix V).

Many of the lakes and lagoons of significance to hapū and iwi in the inquiry district have been implicated by ownership issues at some point in their history due to Crown processes. Two lakes during the Inland Waterways Cultural Perspectives research interview process were highlighted as having ownership issues of particular relevance: Lake Horowhenua[210] and Lake Koputara.[211] As outlined in Chapter 1.2, a report for Muaūpoko claimants in relation to Lake Horowhenua has been commissioned by the Waitangi Tribunal[212] and has already been completed, and so this report will instead only examine non-Muaūpoko claims issues in relation to Lake Horowhenua, and specifically those of Ngāti Pareraukawa and Ngāti Raukawa.[213] Accordingly, a case study of Lake Horowhenua and Hōkio Stream from a Ngāti Pareraukawa and Ngāti Raukawa perspective was undertaken and is detailed in Chapter 5.4.8 of this report.

In relation to Lake Koputara, Pat Seymour provided details from a Ngāti Raukawa perspective on the historic and current issues surrounding the lake in his interview for the

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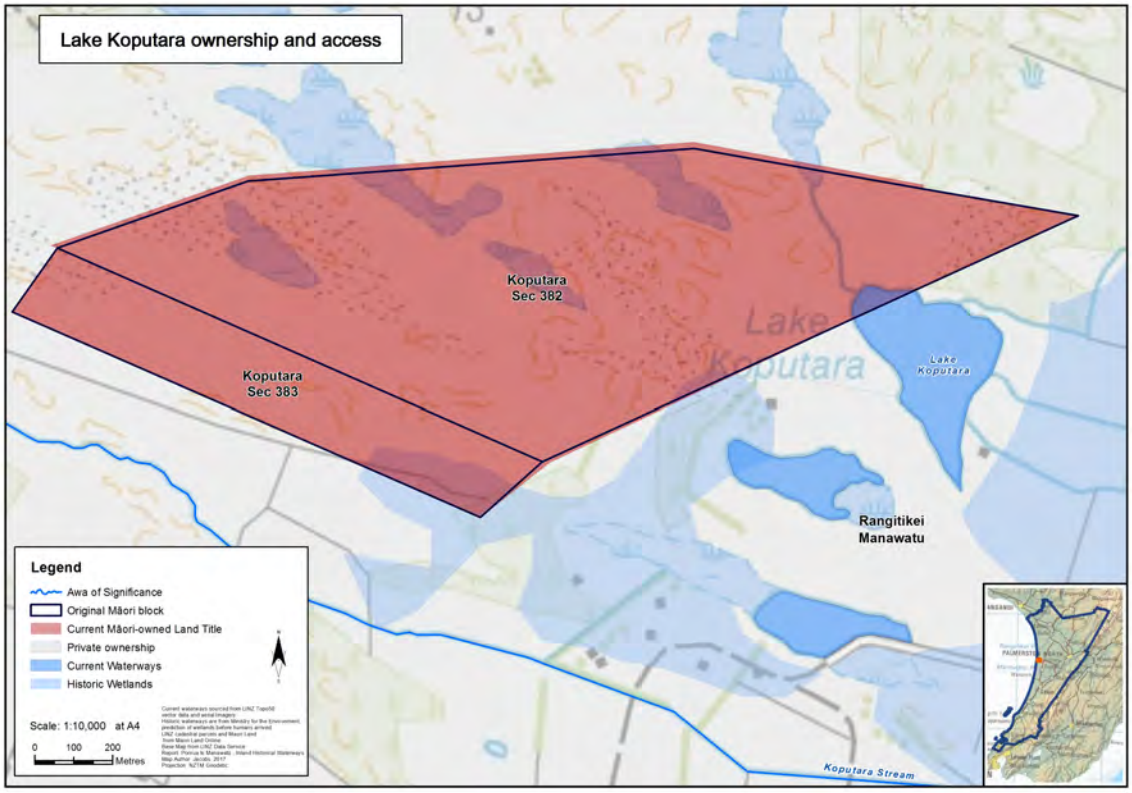
208 Whakauae Research Services, Whakauae Research for Māori Health and Development Symposium booklet, 5th August 2015 at Rata Marae, p. 6.
209 Personal communication, Kiri Parata, during slide 2 of presentation, 5 August 2015.
210 Personal communication, Whatarangi Winiata, IWCP Interview held 28 April 2016 at Te Wānanga o Raukawa, Ōtaki.
211 T Devonshire, Poutama, Spinks and Raumati, 2016, p 147.
212 P Hamer, *'A Tangled Skein': Lake Horowhenua, Muaūpoko, and the Crown, 1898-2000*, Wai 2200 document #A150, June 2015.
213 Personal communication, Whatarangi Winiata, IWCP Interview held 28 April 2016 at Te Wānanga o Raukawa, Ōtaki.

inland waterways cultural perspectives report.[214] He advised that another Crown Forestry Rental Trust research team had interviewed him and will appear as a case study in the *Māori Aspirations, Crown Response and Reserves 1840-2000* report.[215] Ngāti Te Au also expressed their concerns over the ownership of Lake Koputara during their interview for the inland waterways cultural perspectives report.[216] Ted Devonshire explained that because Ngāti Raukawa rangatira objected to the sale of the Manawatū Block, Crown representatives negotiated a reserve around Lake Koputara in recognition of it as one of their main mahinga kai. The main contention is that while the Koputara Trust continues to own part of the lake edge, hapū and iwi owners are denied access by surrounding Pākehā owners (see Map 15 below). Hayden Turoa confirms that 'Ngati Turanga, Ngati Te Au, and Ngati Rakau were purposely excluded from all reserves in the region after the sale, as was the case for Koputara and Pukepuke. This is an extremely important point to make in both case studies as our relationship and interests were promised to be protected but we have never been represented at these sites due to crown actions, bias native land court judgements and government policies. We suffered significantly as we were not granted title after the Rangitikei Sale. We were excluded as our tupuna Parakaia Te Pouepa directly challenged Governor Grey, Featherstone and others unjust approach towards the purchase of the Rangitikei/Manawatu block. The only reason Ngati Turanga are in Koputara now is because Aunty Ada Winiata gave us her shares. She asked hapu to support her on that decision.'[217] Evidence from crown records show a map of the historic reserves in the Rangitikei-Manawatū region along with the associated names, hapu and iwi that were granted reserves.[218]

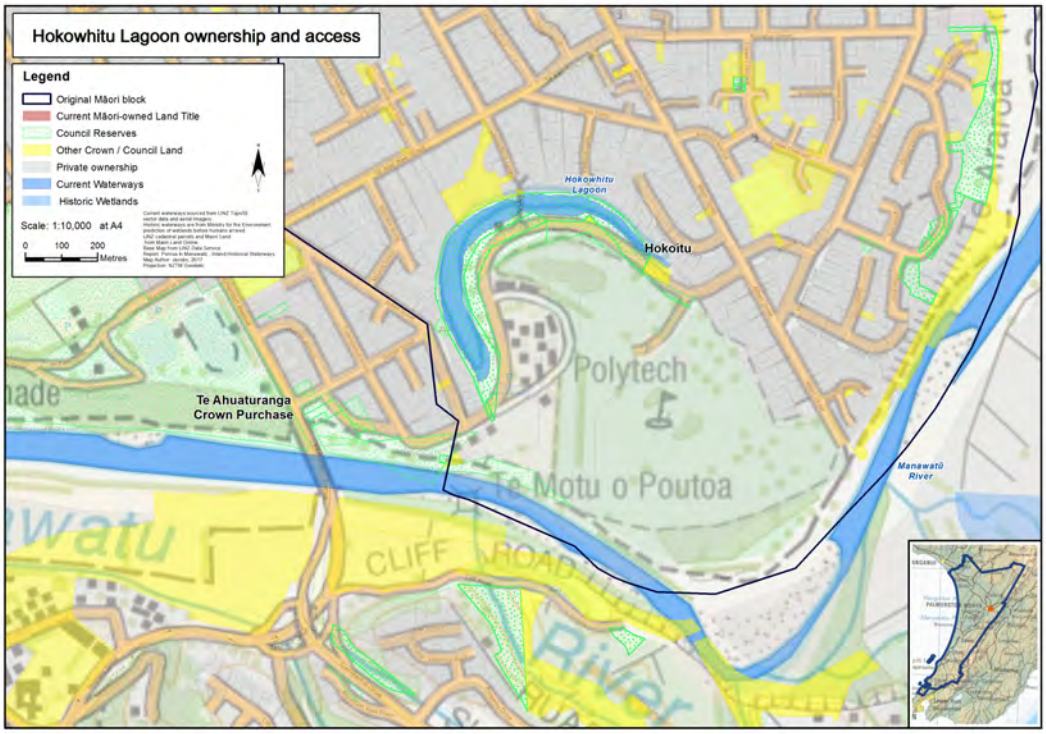
[214] P Seymour, in Poutama, Spinks, Raumati, 2016, pp 109-111.
[215] Personal communication, Dr Paul Husbands, phone call, 17 February 2017.
[216] T Devonshire, in Poutama, Spinks, Raumati, 2016, p 147.
[217] Personal communication, Hayden Turoa, email, 15 August 2017.
[218] Crown grants for reserves in Rangitikei-Manawatū created for Ngāti Kauwhata, Ngāti Parewahawaha, Ngāti Kahoro, Te Mateawa and members of other Ngāti Raukawa-affiliated groups. Table source: 'Abstracts of Titles: Wairarapa and Manawatū', Archives New Zealand, Wellington, MA 12 13 (R12777980); Crown Grant for Rangitikei-Manawatū C, 3 March 1874, MA13/74A, pp 1011-1012. Supplied by Hayden Turoa, email, 15 August 2017.



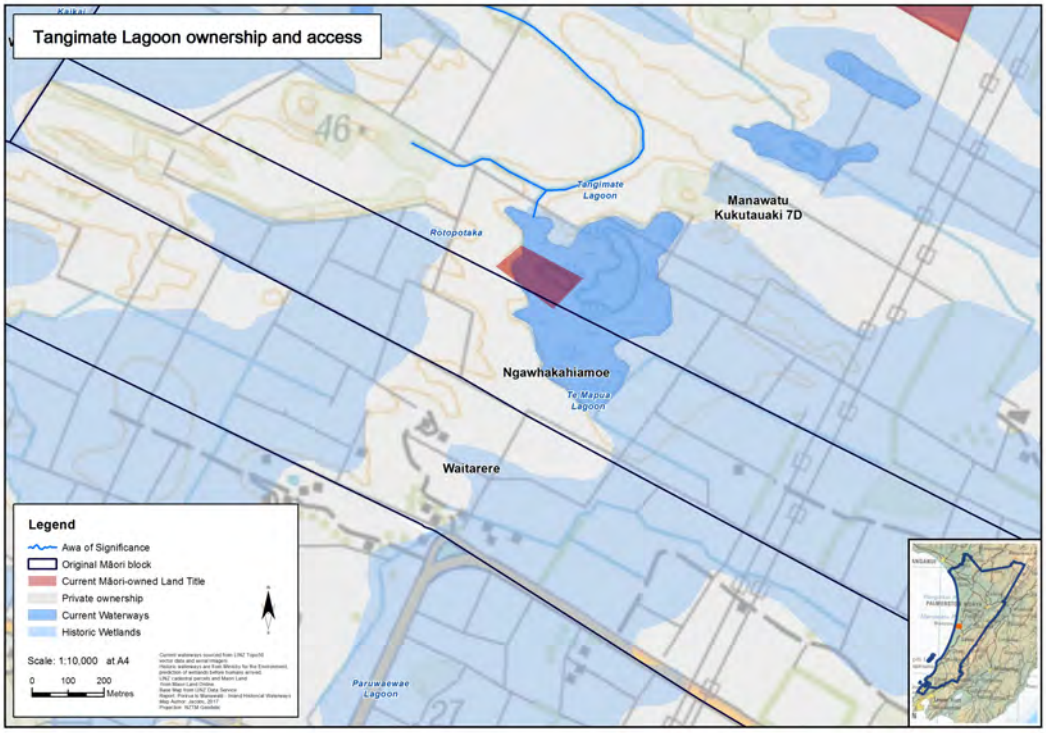
Map 15: **Lake Koputara ownership map 2017.**[219]

Claimants also raised the importance of dune lakes as mahinga kai, and the significance of this loss – both in relation to the loss of ownership of Lake Koputara and numerous other lakes and lagoons too, including the Hokowhitu Lagoon in Palmerston North, Lake Tangimate at Waitarere Beach, Lake Papaitonga in Ōhau, and Cannons Creek Lagoon in Porirua. The following series of maps illustrate the ownership issues raised in relation to these lakes, where very few remain in iwi possession with very limited access for cultural practices.

[219] Created by Jacobs, courtesy of the Crown Forestry Rental Trust.

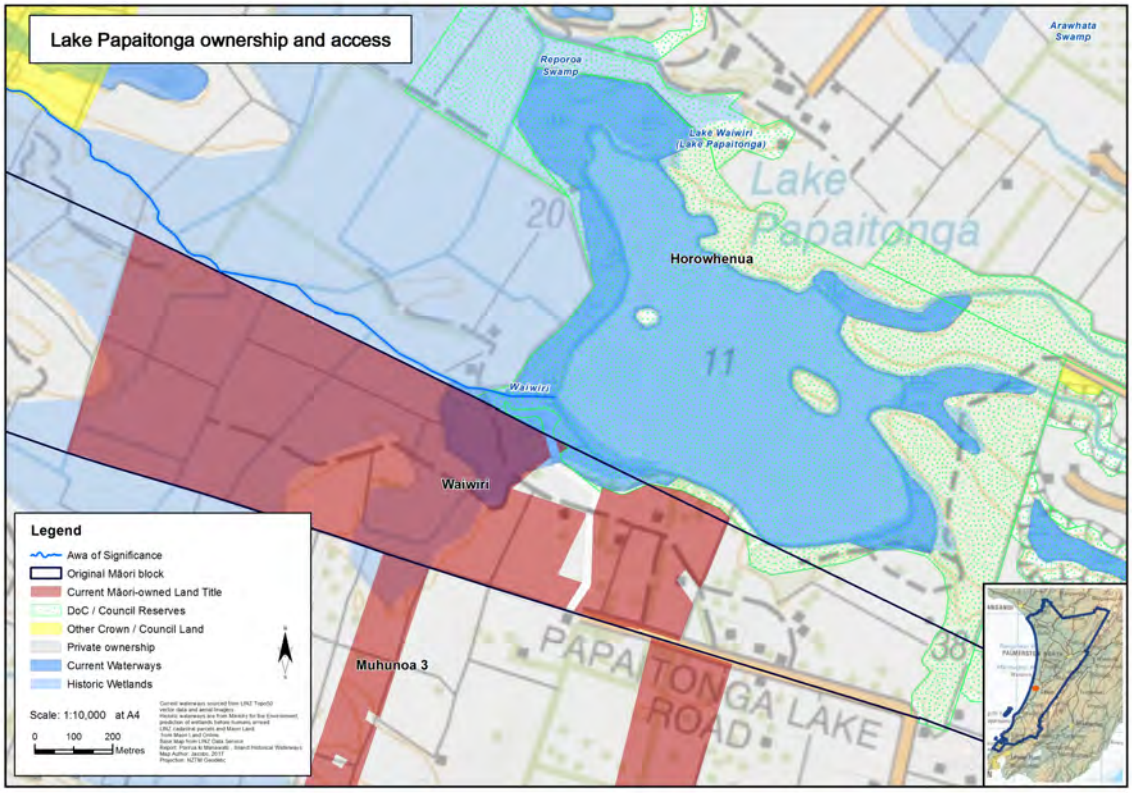


Map 16: **Hokowhitu Lagoon ownership map, Palmerston North, 2017.**[220]



Map 17: **Lake Tangimate ownership, Waitarere, 2017.**[221]

[220] Created by Jacobs courtesy of Crown Forestry Rental Trust.



Map 18: **Lake Papaitonga ownership, Ōhau, 2017.**[222]

The Waiwiri Stream in the map above running from Lake Papaitonga to the Tasman Sea once accommodated at least 20 separate eel weirs.[223] "The stream flows through mainly grazed pasture, and is 6km in length from Lake Waiwiri (more commonly known as Lake Papaitonga). Much of the lake was established as a reserve in 1901, with remaining indigenous vegetation."[224] The reserve is now actively managed by the Department of Conservation. Recent research for Waiwiri was produced by the Manaaki Taha Moana (MTM) project.[225] Results from water quality testing differentiated between sources of E.coli from dairy, birds, and the Pot. The study concluded that the main source of E.coli in the Waiwiri Stream was from cattle, both beef and dairy, demonstrating the effects of land use on nearby water bodies. The study made a number of recommendations, including fencing and planting projects along the Waiwiri Stream.[226]

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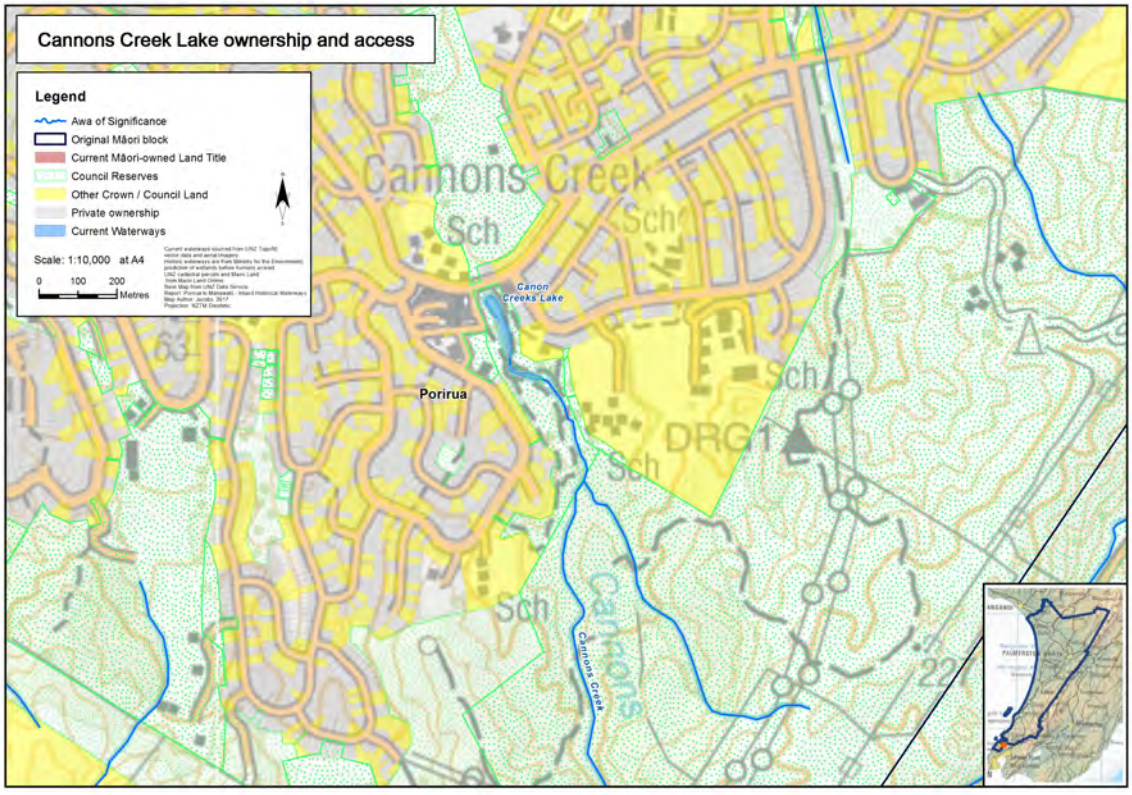
221 Ibid.
222 Ibid.
223 Adkin, 1948.
224 Tene Tangatatai, 2014, Cost Benefit Analysis of Riparian Planting Options for Freshwater Coastal Streams in Horowhenua: Ngā utu kia piki te Mauri o ngā wai a Parawhenuamea, p 67.
225 Allen et al. 2012 Cited in Ibid.
226 Ibid.



Map 19: **Cannons Creek Lagoon ownership, Porirua, 2017.**[227]

2.4.1 Case Study Two: Pukepuke Lagoon

The following case study of land acquisition by the Crown regarding Pukepuke Lagoon highlights issues of ownership, access to a significant mahinga kai, fishing rights, and the effects of drainage.

The Chief Surveyor of the District wrote in a letter of 10 January 1958. It stated that:

> 'One of the conditions of this sale is that the Māori owners retained rights over the waters of the lagoon even though the water is now not within the boudaries of the Māori land. The other condition is that vehicular access be provided... to the lagoons.'[228]

[227] Created by Jacobs courtesy of Crown Forestry Rental Trust.
[228] R.P. Gough, Chief Surveyor of District, Letter 10 January 1958. Archives New Zealand, R22967490.

The original list of owners numbered 47.[229,230] A letter on 27 January 1958 continued the acquisition by the Crown and noted the access track with reference to where Māori did most of their fishing.[231] Another letter on 21 March 1958 specifically referenced that:

> 'this track is at present formed and in use and is the only practicable access to the Lagoon. It is understood that this is the route which the Māori owners have used in the past. Provision is to be made for the granting of an improved access when roading and other development has been completed in this area.'[232]

Unfortunately, as the Archives New Zealand records show, that provision was not carried out. Maps within Archives New Zealand show the open water, wildlife reserve, and Māori access.[233]

A Chief Surveyor letter of 9 January 1961 confirmed that the Commissioner of Crown Lands is 'quite ageeable' to Māori fishing rights in Pukepuke lagoon and access over Crown land.[234] The Secretary, Nature Conservation Council, Department of Lands and Survey, wrote to the Commissioner of Crown Lands on 26 April 1966 that the Royal Forest and Bird Protection Society report indicated their concern of the loss of habitat for wetland birds through drainage.[235] They commented that Pukepuke Lagoon was only a fraction of its former size.

On 1 June 1966, the Commissioner of Crown Lands replied that the only drainage from the Pukepuke Lagoon had been carried out by the Catchment Board.[236] The record continued to confirm the fishing rights and the preservation of a reserve. An adjoining map was provided.[237] This 1 June 1966 letter stated that:

> 'When the Crown acquired the lagoon from the Māori owners a grant of fishing rights and access across the adjoining Crown land was made back to the Māori owners so that it would be very unlikely in the future that this area would be

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229 List of Owners, 16 January 1958. Archives New Zealand, R22967490.
230 Certificate of Title Under Land Transfer Act. Archives New Zealand, R22967490.
231 R.G. Read, Staff Surveyer Department of Lands and Survey, District Office Palmerston North, Letter 27 January 1958. Archives New Zealand, R22967490.
232 R.P. Gough, Chief Surveyor, Letter 21 March 1958. Archives New Zealand, R22967490.
233 Pukepuke Lagoon Maps. Archives New Zealand, R22967490.
234 B.Briffault, Chief Surveyor, Letter 9 January 1961. Archives New Zealand, R22967490.
235 N.G. Krebs, Secretary Nature Conservation Council Memorandum 26 April 1966. Archives New Zealand, R22967490.
236 V.P. McGlone, Commissioner of Crown Lands, 1 June 1966. Archives New Zealand, R22967490.
237 Pukepuke Lagoon Map, Wellington Land District County. Archives New Zealand, R22967490.

included in any farms for settlement but more likely would be preserved as some type of reserve.'[238]

Within the Archives New Zealand records, it is clear that fishing and eeling rights became a prominent issue. On 19 June 1970, fishing rights were confirmed for the owners but the Secretary for Internal Affairs denied other permits within the reserve.[239] Plank notably mentioned in his correspondence that the 1969/70 drought, which dried out the lake, resulted in 30,000 eels taken by Māori or died - providing clear evidence of the historical significance this mahinga kai would have had to local iwi and hapū. The Palmerston North Library records have a photo of the lake in the dried state. Its caption reads:

'The 150 acre Lake Puki Puki [Pukepuke], near Himatangi, which dried up during the drought of 1969-1970, for the first time in living memory. The lake was one of several resulting from the formation of sand dunes along the coast which prevented inland water run-off escaping to the sea. Its average depth was usually 4-7 feet and it was fed by a drain known as the Puki inlet and from water pumped from Mr P R Barber's property during wet weather. The lake now forms part of the Pukepuke Conservative Area and is an important wetland habitat.'[240]

By 1980, commercial fishing was a major issue that appeared a number of times in the Archives New Zealand records, and questions were raised in regards to the original deed, agreement, access and licenses.[241,242] The Department of Internal Affairs appears to have honoured the descendants of the original owners fishing rights but, however, restricted their ability to economically gain from such activity.[243] The Secretary of the Department of Māori Affairs wrote to the Director-General of Lands, Department of Lands and

238 V.P. McGlone, Commissioner of Crown Lands, 1 June 1966. Archives New Zealand, R22967490.
239 A. Plank, Secretary for Internal Affairs, Department of Internal Affairs, 19 June 1970. Archives New Zealand, R22967490.
240 Lake Puki Puki, Himatangi, Digitisation ID: 2011N_Hima1_004769. Public Photograph Collection Hima 1. www.manawatuheritage.pncc.govt.nz
241 B.C. McLay, Department Secretary for Internal Affairs, Deparment of Internal Affairs, 11 April 1980. Archives New Zealand, R22967490.
242 Deparment of Internal Affairs, 16 September 1980. Archives New Zealand, R22967490.
243 B.C. McLay, Department Secretary for Internal Affairs, Deparment of Internal Affairs, 11 April 1980. Archives New Zealand, R22967490.

Survey, raising concerns over poor communication with the Māori owners in regards to their rights and frustrations.[244]

The Pukepuke Lagoon example and the Crown records showed that the recognition of Māori rights broke down over time. Crown and local bodies were able to assert their power ensuring their desires. The effects of such Crown failures were inter-generational. Hayden Turoa spoke recently of the impacts of Crown actions, local body agencies, and drainage on the Pukepuke lagoon and other similar dune lakes and mahinga kai in the region that were significant to Ngāti Turanga.[245] A 2017 Draft Pukepuke Lagoon Management Plan, which Hayden expressed 'was done largely without any consultation with us.' He has sought clarification on the historic account as he noted the following quote: "*Pukepuke wetland was highly valued by Māori who utilised the natural resources. Ngāti Apa had permanent pā close to the wetland prior to European settlement, and Rangitāne O Manawatū also regularly used the site."*[246] Hayden points out disappointment that once again their iwi perspective has been excluded: 'Raukawa pa at this space have not been identified. Namely the pa associated to Ngati Patukohuru, Ngati Turanga, Ngati Parewahawaha, Ngati Kauwhata and Ngati Kahoro? This is what we are currently up against, the Department of Conservation fail to provide balanced account, and any factual history in their telling of local history via their contractors. This is due to either lack of funding or an unwillingness to operate with hapu and marae who are not settled. This is a similar treatment our tupuna faced being excluded from landblocks and iwi who fought alongside of the Crown, and who shared a willingness to sell receiving favourable advantage within the Manawatu, Rangitikei and Horowhenua rohe.'[247]

Jessica Kereama, Te Taiao o Raukawa Chaiperson advised that: 'In contrast to those iwi whom have statutory acknowledgement over areas Ngāti Raukawa have systematically been treated inequitably by DOC[Department of Conservation], despite being mana whenua in areas such as Pukepuke... This becomes apparent in DOC's approach to "business as usual focus" that privileges the stories of iwi whom no longer reside in that

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244 A.N.F. Harris, Secretary for Deparment of Māori Affairs 14 October 1980. Archives New Zealand, R22967490.

245 Personal communication, Hayden Turoa, 13 June 2017.

246 L. Salt, *Draft Natural Heritage Plan for Pukepuke Lagoon,* Manawatū: Milestone 3, (Auckland: Wildlands prepared for Department of Conservation, 2017), p. 5.

247 Personal communication, Hayden Turoa, email, 15 August 2017.

area as paramount and truth, as opposed to the stories of those hapū whom reside in those places and as such are the kaitaiaki of those places. Research that privileges the stories of one people over another, is unfair. A methodology that edits our peoples stories and cut and pastes other iwi stories without edit, is inconsistent. It is unethical to keep engaging in researching those place without DOC/ consultants working with our hapū.'[248]

2.4.2 Case Study Three: Lake Whakapuni

As land was purposefully dried out and dune lakes reduced in size, the Crown acted to benefit settlers rather than Māori when allocating the land of former lake beds. Another issue has been the Crown's demarcation of Māori reserves alongside various dune lakes as 'camping sites' rather than as incorporating the lakes themselves. This meant the reserves became disconnected from the purpose (access to and ability to make use of the lakes) for which they were originally established.[249]

A prime example of the Crown marginalising iwi concerns regarding ownership of lakes and access to mahinga kai is the case of Lake Whakapuni that was located on the northern side near the mouth of the Manawatū River.

In September 1909, a letter was written in te reo[250] and then translated into English[251], by Hiria te Huruhuru, Hone Reweti, Kaatene Piringarau, and Winiata Pataka to the Hon. Acting Prime Minister and Native Minister regarding the return of the following lands from the sale of the Manawatū Block to descendants of the original owners: Te Wharangi, Te Whakapuni, and Marupapaka Reserves from Sale of Manawatū Block. In the letter, they asked that:

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248 Personal communication, Jessica Kereama, email, 22 August 2017.

249 Personal communication, David Alexander, appraisal received during the Draft Report feedback stage. Received via email from Nicola Kiri-Smith, Crown Forestry Rental Trust 5 July 2017.

250 Te Reo letter from Riria te Huruhuru and others to Acting Prime Minister re Te Whakapuni and other land. Archives New Zealand, Wellington. R22409665 – From: Hiria te Huruhuru, Hone Reweti and others – Subject: Te Wharangi, Te Whakapuni and Marupapaka Reserves from Sale of Manawatū Block. For return of lands to descendants of original owners, MAI99, Record 1909/600.

251 English translation of letter from Riria Te Huruhuru and others to Acting Prime Minister re Te Whakapuni and other land. Archives New Zealand, Wellington. R22409665 – From: Hiria te Huruhuru, Hone Reweti and others – Subject: Te Wharangi, Te Whakapuni, and Marupapaka Reserves from Sale of Manawatū Block. For return of lands to descendants of original owners, MAI99, Record 1909/600.

> ‘lands reserved by our fathers from the sale of Manawatū by Ihakapara Tukumaru be handed over to us. The lands are: Te Wharangi, Te Whakapuni, Marupapaka. These parts were not included in the sale of Ihakara.’[252]

The Ihakara sale was later deemed by the Crown to be part of the Awahou Sale Deed 157 Wellington Series, dated 10 December 1872.

Archival records include evidence of communication and documentation about the drain that was cut from Lake Whakapuni to the river, and the impact of this on whitebaiting.[253] A map depicts the ‘Plan Certificate of Title Volume 600 Folio 137 and Whakapuni Drain – Foxton Beach’.[254]

A letter by Murray Wilson to the Acting Secretary for Marine, dated 26 May 1958, stated that his father inserted the drain in what they considered to be their own land on which they stated they were entitled to make such land changes, in order to ‘keep seas at flood levels within high tide.’[255] This scenario was also mentioned in letters from the Acting Secretary for Marine.[256]

Of particular note, the location of Lake Whakapuni was hand written onto a map, in the area included in the Reserve of Rangitīkei-Manawatū Purchase Sec 376 Carnavorn (50 acres) C.G to Ihakara and Kereopa Tukumara. Interestingly, a hand written notation on the left hand side of the map, noted that: ‘Moutere Sandy was vested in WTM Railway Co’y, but Lake Wakapuni was excepted.’[257]

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252 Ibid.

253 Evidence of communication and documentation about the drain that was cut from Lake Whakapuni to the river, and the impact of this on whitebaiting. Archives New Zealand, Wellington. R3951187, Wellington Land District – Whitebaiting – Whakapuni Drain – Manawatū River – Cutting of Drain from Whakapuni Lake to River. Reference ABWN W5021 6095 Box 631, Record 22/5127.

254 Map: ‘Plan Certificate of Title Volume 600 Folio 137 and Whakapuni Drain – Foxton Beach’. Archives New Zealand, Wellington. R3951187, Wellington Land District – Whitebaiting – Whakapuni Drain – Manawatū River – Cutting of Drain from Whakapuni Lake to River. Reference ABWN W5021 6095 Box 631, Record 22/5127.

255 Letter by Murray Wilson to the Acting Secretary for Marine, dated 26 May 1958 re drain on Lake Whakapuni. Archives New Zealand, Wellington. R3951187, Wellington Land District – Whitebaiting – Whakapuni Drain – Manawatū River – Cutting of Drain from Whakapuni Lake to River. Reference ABWN W5021 6095 Box 631, Record 22/5127.

256 Letters from the Acting Secretary of Marine. Archives New Zealand, Wellington. R3951187, Wellington Land District – Whitebaiting – Whakapuni Drain – Manawatū River – Cutting of Drain from Whakapuni Lake to River. Reference ABWN W5021 6095 Box 631, Record 22/5127.

257 Map including hand drawn Lake Whakapuni. Archives New Zealand, Wellington. R22410268 – Aputa Ihakara petition Whakapuni Lake 1931.

Iwi continued to raise their concerns. The Aputa Ihakara petition No. 260 of 1927 regarding Fishing Lake Whakapuni, received on 17 October 1931 by the Clerk of the Native Affairs Committee, House of Representatives stated:

> *To the Honourable Speaker and Hourable Members in Parliament Assembled in Wellington.*
>
> *This is a petition from me and the Ngati Raukawa tribe residing permanently in the Manawatu district praying for the removal of the restrictions imposed by the Crown on the stream flowing from Whakapuni Lake, that is, the restrictions prohibiting me and my people from fishing for whitebait for our own use and maintenance. Wherefore I and my people hereby petition under the provisions of the Treaty of Waitangi that this stream be exempted from the Act prohibiting us from fishing in the same and that such Act be made to operate on the European people who are conversant with the framing of such Acts. The reasons for this petition are as follows:-*
>
> 1. *This Lake namely Whakapuni has been the life water of our ancestors and has also been mine and my peoples today. The fish which we obtain from this lake are eels, flounders, whitebait, and other fresh-water fish and also shellfish called Kakahi.*
> 2. *When Ihakara Tukumaru was living he reserved this lake from his sale of Rangitikei-Manawatu to the Crown, for life water for me, Te Aputa-ki-Wairau Ihakara and my people and from that time to this I have fished in that Lake.*
>
> *Wherefore I and my people ceaselessly pray to your Honourable House to remove the said restrictions prohibiting me and my people from fishing in this Lake.*
>
> *List of names of the petitioners:-*
> *(Sgd) Te Aputa Ihakara and others.*[258]

The Office of Ikaroa District Native Land Court and Māori Land Board's letter of 7 October 1927 regarding Petition No. 260 of 1927 reported that they had made enquiries at

[258] Report on Petition No. 178/31 of Aputa Ihakara and others that Native be exempt from Acts prohibiting of restriction the taking of Shell Fish and other Native Fish. National Archives Reference: R22420343.

the Survey Office but had been 'unable to accurately identify Whakapuni Lake'. They did, however, note that:

> 'a 50 acre Block at the mouth of the Rangitikei River was purchased by the Crown from Ihakara Tukumaru at a very early date… known as Tangimoana Township and has a large swamp in the centre communicating with the Rangitikei River by a creek, and it is possible that this swamp is locally known as Whakapuni Lake.'[259]

On the 20 October 1927, the Commissioner of Crown Lands, replied to the Under-Secretary for Lands in the matter of the abovementioned Petition No. 260 of 1927 regarding Whakapuni Lake. He stated that:

> 'a thorough search of Office records has failed to disclose the position of the lake referred to, and there is no reference to it on any of the old plans.
>
> Mr. Taite Te Tomo, who is at present engaged in the Native Affairs Committee room, states that the lake is situated at the Manawatū Heads, but I cannot trace it there, and I am therefore of the opinion that this cannot be correct, as the petitioners refer to the Rangitikei Manawatū sale to the Crown and this block does not extend to the Manawatū River.'

The Commissioner went on to outline a discrepancy with the petitioner's reference to the Manawatū-Rangitikei block (ibid.), stating that it did not extend to the Manawatū River. Further, the Commissioner stated that the block in question included certain reserves set aside for Ngāti Raukawa, but that Ihakara Tukumaru and Kereopa Tukumaru had sold their reserve (Section 376 Carnarvon – 50 acres), with no reservations in the deed of convenance. Thus, it was concluded that:

> 'if the petitioners are referring to the abovementioned land, the mention of the Ngāti Raukawa tribe is out of place as it is distinctly stated: the finding of the Commission appointed to investigate the Rangitikei Manawatū Block that this tribe was not entitled to any ownership therein.'[260]

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[259] Letter from the Office of Ikaroa District Native Land Court and Māori Land Board, dated 7 October 1927 regarding Petition No. 260 of 1927. National Archives Reference: R22420343.

[260] Letter of 20 October 1927, from the Commissioner of Crown Lands, to the Under-Secretary for Lands in the matter of the abovementioned Petition No. 260 of 1927 regarding Whakapuni Lake. Archives New Zealand, Reference R22420343.

The Manawatū-Rangitikei block purchase was stated in a separate area to the north. The Crown set aside 73 reserves in that block in 1872, and a significant number of those were alongside rivers, lakes, or swamps.[261] This provides clear evidence that the Crown was aware of the significance of inland waterways to Māori at the time.

A subsequent letter from the Commissioner of Crown Lands, Land and Survey Department, dated 6 December 1927 to the Under-Secretary for Lands stated that:

> 'a further search to trace the position of the above lake has resulted in showing that it is situated near the mouth of the Manawatū River and on the North side thereof' and that the petitioners were therefore 'incorrect in saying that the land in this locality was part of the Rangitikei Manawatū Block as it is comprised in the Awahou purchase (see Deed No. 14, 12 November, 1858)'.[262]

The above example illustrated Crown decisions and legislation seriously affected the hapū and iwi concerned for generations. Those impacted upon clearly expressed the detrimental causes that the loss of mahinga kai was causing as they referenced the waterway as their 'life water'. The example shows the iwi believed that their rights to access mahinga kai continued because the waterways were exempt from the land sale. This was disputed by the Crown and the petitions of the iwi were subsequently dismissed.

Two further lakes of particular interest to claimants were Lake Waiorongomai and the adjacent Lake Kahuwera, south of the Waikawa River. Lake Waiorongomai has remained in iwi ownership up to the present day while Lake Kahuwera no longer exists.

2.4.1 Case Study Four: Lake Waiorongomai and Lake Kahuwera

This case study was inspired by the historic research conducted and presented by Rupene Waaka of Ngāti Raukawa, Ngāti Maiotaki and Ngāti Kapu to his whānau and hapū of Ngāti Maiotaki at Taaringaroa, Ōtaki, 11 January 2014.[263] His presentation *Waiorongomai Blocks 9 and 9A walkabout presentation* provided an outline of Native

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[261] Further correspondence relating to the Manawatū-Rangitīkei Purchase, presented to both Houses of the General Assembly, by Command of His Excellency, Wellington, 1872. Crown record copies provided to the research team by Rodney Graham during his interview, 6 September 2016.

[262] Letter from the Commissioner of Crown Lands, Land and Survey Department, dated 6 December 1927 to the Under-Secretary for Lands regarding Petition No. 260 of 1927 regarding Whakapuni Lake. Archives New Zealand, Reference R22420343.

[263] R Waaka, 11 January 2014, Ngāti Maiotaki Waiorongomai Blocks 9 and 9A walkabout presentation at Taaringaroa, Ōtaki.

Land Court minutes, supporting maps, hapū ownership of the original Waiorongomai Block, and subsequent subdivisions. A similar presentation was conducted by Waaka for the Manaaki Taha Moana Project[264] which supported the hapū-led restoration project at Lake Waiorongomai.[265] Permission has been granted by Waaka to cite his presentation material in this report.[266] His research has been expanded upon in this case study to specifically include a focus on how the Crown's system of title and ownership has impacted on both Lake Waiorongomai and Lake Kahuwera and the associated hapū.

Subdivision and sale:

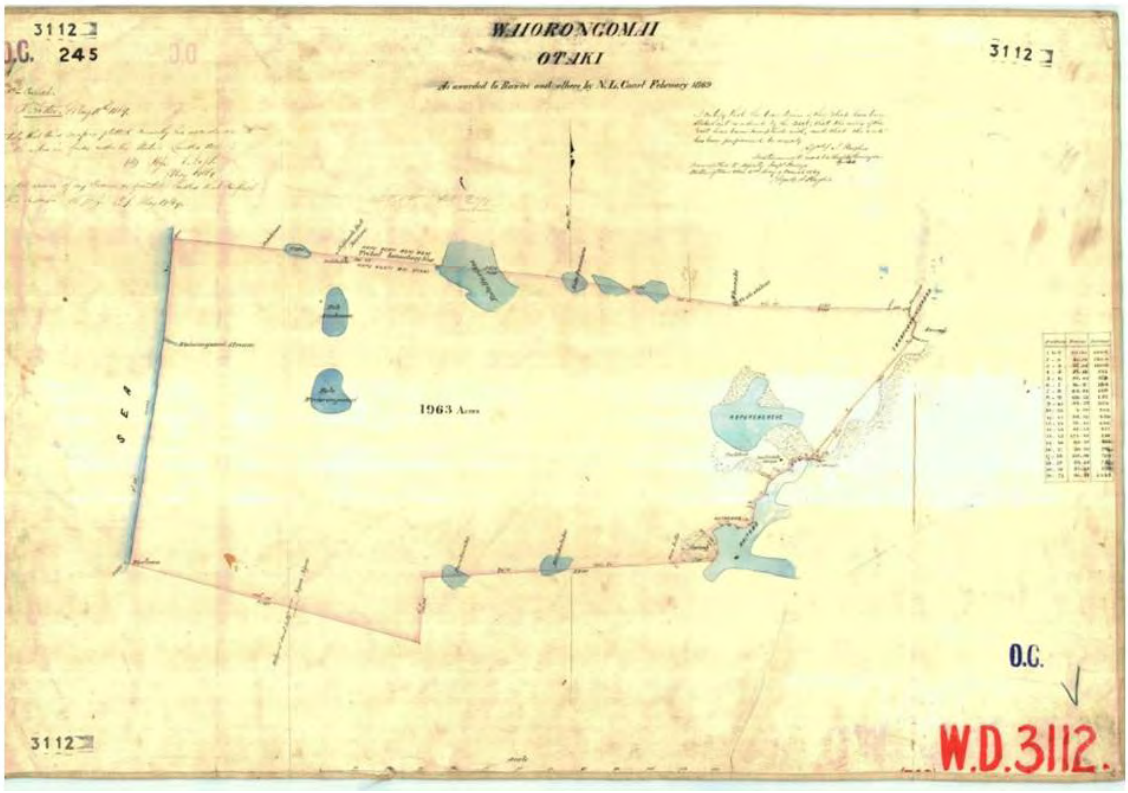
In 1867, Rota Te Tahiwi of Ngāti Maiotaki commenced a claim for Lake Kahuwera[267] in the Native Land Court.[268] After a number of adjournments,[269] including counter claims, in 1869 the Judge in ruled in favour of Ngāti Maiotaki for Lake Kahuwera.[270] At the same time, he had also commenced a claim for the Waiorongomai Block. The original Waiorongomai Block was an estimated 1963 acres and included 10 dune lakes or lagoons (see Map 20 below). Of these, three are still in existence: Lake Kopureherehe, Lake Waitawa, and Lake Huritini. The remaining lakes and lagoons have ceased to exist. What was clear from the Native Land Court minutes was that was that Te Tahiwi did not want a separate grant for Lake Kahuwera as it was included in the survey of Waiorongomai: "if he proved his title to Waiorongomai, he wished one grant for the whole".[271]

264 www.mtm.ac.nz
265 R Waaka, 6 March 2014, Lake Waiorongomai overview presentation for MTM and Victoria University Landscape Architecture student wānanga at Raukawa Marae, Ōtaki.
266 Personal communication, Rupene Waaka, 25 February 2017.
267 Spelt incorrectly as Kahuera in the Native Land Court Minutes.
268 Native Land Court Ōtaki Minute Book 1B, 1867, p. 47, in Waaka, 11 January 2014, Slide 2.
269 Native Land Court Ōtaki Minute Book 18, 1891, pp. 307-367, 372-391, 394-396, 404-405, 419-420, 477-481, in Waaka, 11 January 2014, Slides 12-13.
270 Native Land Court Ōtaki Minute Book 1G, 1869, p 99.
271 Ibid.

Map 20: **Original Waiorongomai Block map.**[272]

Although there were counter claims and descriptions of historical occupancy by other iwi and hapū,[273] the 1869 judgement resulted again 'in favour of Rota and party'. Rota was recalled and proposed 10 persons, including himself, as owners and another 16 as interested persons.[274] This illustrates the Crown's strategy of reducing the number of owners from large hapū numbers to a few individuals. The land was to be surveyed at a surveyors charge of £17.12.0.[275] Both Maps 20 and 21 show that, at the time, Lake Waiorongomai and Lake Kahuwera were of similar size.

[272] Cited in Waaka, 2014, Presentation Slide 23.
[273] Native Land Court Ōtaki Minute Book 1G, 1869, pp. 100-123.
[274] Native Land Court Ōtaki Minute Book 1G, 1869, p. 123-124, in Waaka, 11 January 2014, Slide 2.
[275] Native Land Court Ōtaki Minute Book 1G, 1869, p. 124.

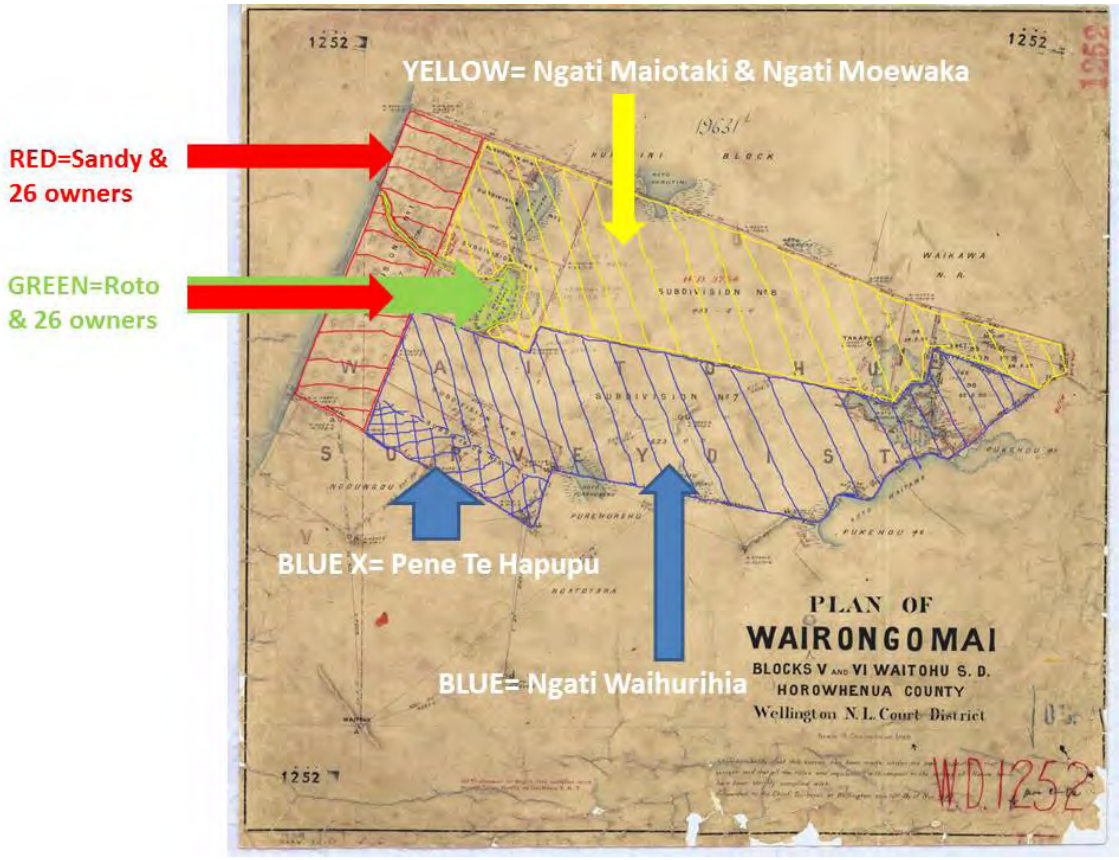


Map 21: **Original Waiorongomai Block Survey Map.**[276]

On 16 September 1891, through a Supreme Court decree, the original 1869 Native Land Court decision of 10 owners became void and the full 26 people were declared owners of the Waiorongomai Block.[277] Almost immediately, on 26 October 1891, a subdivision case for the Waiorongomai Block then commenced in the Native Land Court.[278] After a number of adjournments,[279] the Waiorongomai Block of 1,963 acres, that included Lake Waiorongomai and Lake Kahuwera, were eventually subdivided into 10 blocks.[280] Two blocks, Waiorongomai 1 and 10, were declared "general reserves". Waiorongomai Block 1 was situated along the beachfront and Waiorongomai Block 10 surrounded Lake Waiorongomai and included the Waiorongomai Stream. These blocks were reserved by tūpuna for future generations as they were significant for collecting kai and other resources.[281] Lake Waiorongomai was also considered to be a wāhi tapu.[282] The

276 Waaka, 6 March 2014, Presentation Slide 8
277 Native Land Court Ōtaki Minute Book 18, 1891, pp. 278-279, in in Waaka, 6 March 2014, Slide 10.
278 Native Land Court Ōtaki Minute Book 18, 1891, pp. 277-305, in Waaka, 11 January 2014.
279 Native Land Court Ōtaki Minute Book 18, 1891, pp. 307-367, 372-391, 394-396, 404-405, 419-420, 477-481, in ibid, Slides 12-13.
280 Native Land Court Ōtaki Minute Book 18, 1891, p. 394, in ibid, Slide 13.
281 Personal communication, Rupene Waaka, 6 March 2014.
282 Ibid.

remaining eight sections were allocated and subdivided between the hapū Ngāti Maiotaki (which included Ngāti Moewaka) and Ngāti Waihurihia as well as individual owners (see Map 22 below).



Map 22: **Subdivision of Waiorongomai Block to hapū and individuals.**[283]

> '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 hapū, Ngātimaiotaki and Ngātiwaihurihia. 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 land off about the boundary at Te Ngoungou and that the Ngātimaiotaki take the Northern ½ of the remainder of the block and the Ngātiwaihurihia southern half.'[284]

[283] Waaka, R., 6 March 2014, Presentation.
[284] Native Land Court Ōtaki Minute Book 18, 1891, p. 426, in ibid, Slide 14.

Soon after the 26 October 1891 subdivision ruling, the ten Waiorongomai blocks were once again further subdivided. At this time Waiorongomai Block 1 also ceased to be a reserve. On 5 December 1891, through an order to partition the Waiorongomai Block 1 notably held in the Wellington Native Land Court, the judge sealed its fate.[285] The owners gathered in court that day and then proceeded to sell 200 acres of the 267 acres in Waiorongomai 1 to William Martin Simcox. They set aside the remaining two parts either side of Waiorongomai Stream, being 33.5 acres, which became Waiorongomai Block 1A.[286] In 1891, the listed owners of Waiorongomai 1A numbered 59.[287]

Waiorongomai Block 10 continues to remain as a reserve and is still 100 per cent in Māori ownership today. Ngā Hapū o Ōtaki kaumātua continue the oral narrative of Haunui-a-nanaia and his journey that named significant waterways along the Kāpiti-Horowhenua coast. Te Waari Carkeek of Ngāti Raukawa, Ngāti Toa Rangatira describes that after leaving the Wairarapa:

> 'Hau-nui-a-nanaia being exhausted from his hasty journey took advantage of a passing comet and after the appropriate 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 Māori and the coastline was in the shape of an umu - a cooking pot and thus he named the area Paraparaumu. Just after Ōtaki the tōhunga'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 kahu – a cloak being wera - hot. The comet landed at the spot which created Lake Waiorongomai.'[288]

The cultural significance of this sacred site was 'mahinga kai, tānga i te kawa, puna rongoā, papa kāinga, pā, tohu ahurea, wāhi whakawātea and wāhi whakarite. One historic example of the site being used for whakawātea is Te Rauparaha and his warriors -

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285 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. Material provided with permission for use by Kaumātua and Waiorongomai 1A Trustee, Nick Albert 28 February 2017.

286 Native Land Court Wellington Minute Book 20, p. 353. Material provided with permission for use by Kaumātua and Waiorongomai 1A Trustee, Nick Albert, 28 February 2017.

287 Partition Order for Waiorongomai No. 1A, Wn N. B. 20/35-1, Schedule No. 1A Block. Material provided with permission for use by Kaumātua and Waiorongomai 1A Trustee, Nick Albert, 28 February 2017

288 Personal communication, Te Waari Carkeek, 22 February 2014.

including those of Ngāti Toa Rangatira, Ngāti Raukawa and Te Āti Awa – who visited Lake Waiorongomai after battle to cleanse themselves in the waters as they transitioned from a state of tapu back to noa.[289] Lake Waiorongomai was also noted in recent Waitangi Tribunal Hearings as a culturally significant historic site to Muaūpoko.[290] In 1948, George Adkin wrote that, according to his Māori informants, the name signifies the waters (wai) where warriors cleansed themselves after war and donned the garments (mai) of peace (rongo)'.[291] Adkin's description of the lake at that time was:

> 'One of the larger lagoons of the Horowhenua dune-belt. It is situated a little over half a mile from the coast and the same distance south of the Ngāti Wehi Wehi – 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.'[292]

Miki Rikihana wrote about the ancestral landscape of Lake Waiorongomai in 1988 which was included in the *Ngāti Toa Rangatira, Ngāti Raukawa, Te Āti Awa ki Waikanae Fisheries Claim Report*.[293] He identified the main hapū of Ngāti Raukawa who had fishing rights in the area of Lake Waiorongomai and Lake Kahuwera as well as the surrounding wetlands as Ngāti Pare, Ngāti Waihurihia, Ngāti Maiotaki, Ngāti Koroki, and Ngāti Moewaka. This kaumātua provided the locations of papakāinga for each of the hapū around these lakes, indicated by asterisks in Map 23 below. He also described that these temporary papakāinga were used seasonally from November through to May and were operational up until the 1940s. Target species included tohemanga, pipi, tuna, fish (kahawai, kanae, tamure, and shark) and were all cleaned, dried or smoked. Rikihana mentioned that the main living pā were either two kilometres inland at Ngatotara (Forest Lakes area) or five kilometres south at Pakakutu (pā near the Ōtaki River mouth). As an avid fisher he also included the pa-tuna sites in Map 23 and described in detail the

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289 Ibid.
290 Waitangi Tribunal Muaūpoko Korero Tuku Iho Waitangi Tribunal Hearing, October-December, 2015.
291 GL Adkin, p 402.
292 GL Adkin, pp 401-402.
293 Ngā Kaitiaki o Raukawa, Ngāti Toarangātira, Āti awa ki Waikanae, Ngāti Raukawa, Iwi Fisheries Claim Report, date unknown.

customary fishing practices of catching and holding eels at Lake Waiorongomai.[294] Although not specifically mentioned by Rikihana, kākahi were also a prominent food source present in Lake Waiorongomai, evidenced by the large quantities of shells within the middens surrounding the lake.

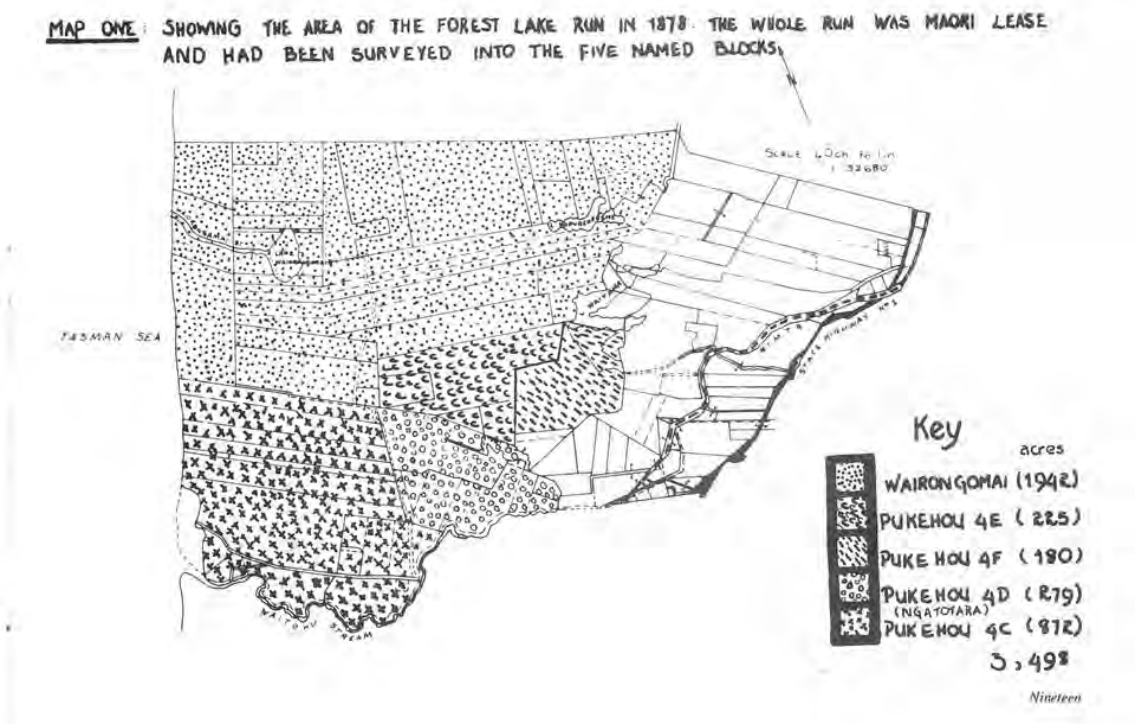
Map 23: **Papakāinga and pā tuna (eel weir) sites at Lake Waiorongomai.**[295]

Although Lake Waiorongomai and Lake Kahuwera were of similar size in the late 1800s, this is no longer the case as Map 23 clearly illustrates. While Lake Waiorongomai has reduced in size, Lake Kahuwera has been removed from the landscape altogether as a result of the leasing of land to Pākehā farmers, the intensification of drainage for farming purposes, and the change in ownership from hapū and iwi. Indeed, the transformation of inland waterways to a farming landscape has been a common practice throughout the inquiry district.

294 Ibid, pp 83-85.
295 Created by Jacobs, courtesy of Crown Forestry Rental Trust. Reproduction of Miki Rikihana's map in Ngā Kaitiaki o Raukawa, p. 85.

Farming and drainage:

John Hadfield was the first Pākehā farmer to lease the Māori owned area south of Ōtaki and the Waitohu Stream including the Waiorongomai Block and parts of the Pukehou Subdivided Blocks see Map 24 below).[296] He named the area 'Forest Lakes', which included Lake Ngatotara, Lake Kopureherehe, Lake Waitawa, Lake Waiorongomai, and Lake Kahuwera. Although the name Forest Lakes continues to be used today, it now only refers to a smaller area around Lake Kopureherehe.

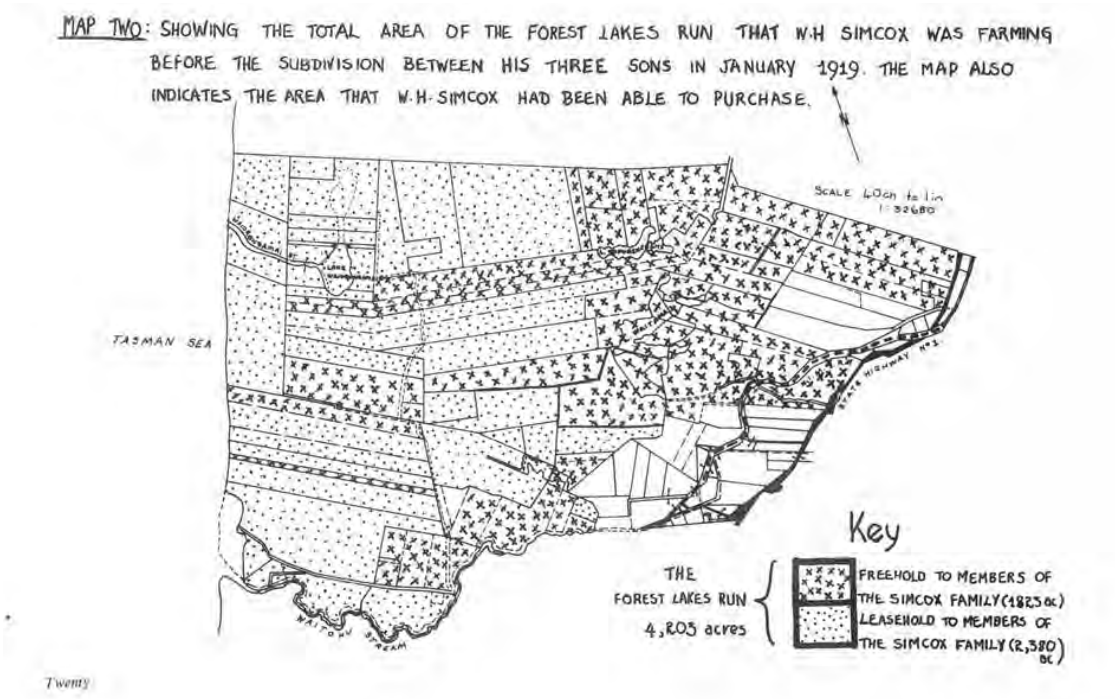


Map 24: **Waiorongomai and Pukehou Blocks.**[297]

Another early settler W.H. Simcox first visited the Forest Lakes area in 1877 and went into partnership with Hadfield to farm the Forest Lakes area in 1878. However, within the year Hadfield pulled out and F.W. Rutherford took over his half share.[298] Mr and Mrs Simcox were devout Christians and became trusted and respected by the local Māori population. Mr Simcox purchased local Māori land blocks as they became available via the proceedings of the Native Land Court as well as via the relationships Mr and Mrs

[296] B Farthing, 'Forest Lakes', in *Ōtaki Historical Society Journal Volume 1* (Ōtaki: Ōtaki Historical Society,1978), p 11.
[297] Ibid, p 19.
[298] Ibid, pp 11-12.

Simcox had developed with local Māori.[299] The farming partnership with Rutherford lasted 10 years until 1888 when for 3,500 pounds Simcox bought Rutherford's share consisting of freehold lands and leaseholds lands shown in Map 17 below, as well as livestock and wool.[300] Map 25 shows that in 1919, Mr Simcox was farming 4,203 acres in the Forest Lakes area and of this he then owned 1,823 acres (43 per cent). What this illustrates is that within the 41 years from 1878 to 1919, Māori ownership in this area had significantly reduced to just over half.



Map 25: **Waiorongomai and Pukehou freehold and leasehold blocks.**[301]

Farthing wrote a *Forest Lakes* article in the Ōtaki Historic Journal stating:

> '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

299 Ibid, p. 14.
300 Ibid, pp. 12-13.
301 Ibid, p. 20.

> and needed money. Such actions lead to a fragmentation of Māori land and created difficulties with regard to future economic management.'[302]

In 1919, at the age of 78 years, W.H. Simcox handed over his freehold and leasehold lands to his three sons (Martin, Selwyn and Percy) who along with their wives, did not have the same rapport with Māori.[303] This was evidenced when, in 1920, Pairoroku Rikihana applied to the Native Land Court for an injunction because the lessee, Mr Selwyn Simcox, had instigated drainage between Lake Kahuwera and Lake Waiorongomai.[304] The drain connected the two lakes and had resulted in decreasing the size of Lake Kahuwera which was of grave concern to the local hapū.[305]

> 'European is digging drains – has no right on land – digging drains will empty lake where we get eels. We have had a 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.'[306]

The drainage practices continued into 1921, as did the court case. Pairoroku Rikihana provided evidence of Selwyn Simcox also instigating drainage around Lake Waiorongomai. In Rikihana's opinion, Simcox had significantly drained Lake Kahuwera. He highlighted to the judge that this action had significantly decreased the eel population and catches.[307]

> '…Simcox drained Kahuwera into Waiorongomai 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

302 Ibid, p. 14.
303 Ibid, p. 15.
304 Court minutes refer to Mr Simcox. Selwyn was derived from Map 3 Waiorongomai and Pukehou Block divided amongst W.H. Simcox's three sons, in ibid, p. 21.
305 Waaka, 6 March 2014, Slide 18.
306 Native Land Court Ōtaki Minute Book 55, 1920, p. 213, in Waaka, 6 March 2014, Slide 18.
307 Native Land Court Ōtaki Minute Book 56, 1921, p. 57, in ibid, Slide 19.

> reduced the height of the water by at least 18 inches. We desire to prevent Simcox from draining the lake…'[308]

Unfortunately for the Māori owners of Waiorongomai Block 10, the judgement was not in their favour and the case was dismissed. The judge informed the Māori owners that Mr. Simcox's actions of improving the land for grazing without creating waste were in accordance with his lease agreement and therefore lawful.[309] As shown in the quote below, draining not only was permitted, but encouraged. The ruling and judge's perspective did not view the farmers' actions as detrimentally interfering with another block, even though this ruling ran contrary to Māori customary rights and interests as guaranteed in Te Tiriti o Waitangi. From their hapū perspective, they had indicated that the draining activities around Lake Waiorongomai (Block 10) were indeed directly impacting on and detrimental to the resources they were able to collect from the surrounding wetlands (e.g. Waiorongomai Blocks 3B1, 3B2, 3B3, 3A) and Lake Kahuwera (Waiorongomai Block 2).

> '…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.'[310]

Adding to the complexity was that a case for Lake Kahuwera could not be taken up as it was no longer in Māori ownership. Although Mr W.H. Simcox likely allowed local hapū to collect resources from the lake, given his rapport with Māori noted earlier, access to the lake may not have continued once the land was transferred to his sons. Selwyn Simcox sold Waiorongomai Block 7 which included Lake Kahuwera to Mr A.D. Webster

[308] Ibid.
[309] Native Land Court Ōtaki Minute Book 56, 1921, p. 58, in Waaka, 6 March 2014, Slide 20.
[310] Ibid.

in 1934.[311] This block changed hands several times and was purchased by Mr A.H. Keelan (a grandson of W.H. Simcox) in 1978.[312]

The aerial photo below taken in 1942 shows Lake Waiorongomai, Lake Kahuwera, and Lake Huritini within close vicinity of the Waikawa River mouth. The size of Lake Kahuwera at that time had reduced considerably and appears to have a sand blown area where a part of the lake bed once existed. A considerable amount of sand blown area is also present along the coastal region. Waiorongomai Block 1 in this image mostly consisted of sand in exposed dunes and the Waikawa River mouth is just inside the northern boundary line of the block.

Figure 17: **Waikawa River mouth, Lake Waiorongomai and Lake Kahuwera, 1942.**[313]

The Under-Secretary of the Department of Māori Affairs is noted within Archives New Zealand Records as writing but not sending a letter to the Commissioner of Works in Wellington on the 11 April 1949 that stated:

311 Farthing, p. 15.
312 Ibid, p. 22.
313 Land Information New Zealand (LINZ) and licensed by LINZ for re-use under the Creative Commons Attribution 3.0 New Zealand License.

> ‘the owners of the land draining to the Wai[o]rongomai Lake near Ōtaki are, at present very concerned by the fact that a sand drift has completely blocked the outlet of the lake at the beach’.[314]

However, on the same day a one page memorandum for the Under-Secretary of the Department of Māori Affairs was written by G.D. Turnbull of the Department of Māori Affairs stating that it was in fact the ‘settlers in the area... are at present concerned.’[315] He went on to tentatively estimate the cost of thatching, planting, and excavating the length of the drain (known as Waiorongomai Stream) to be £1000. He refers to the Works Department carrying out ‘considerable sand dune reclamation work in this district’ and who might be able to offer financial assistance. His concern was that if the work was not done it would ‘depreciate the value of the farm’ and lead to further coastal dune erosion. He also noted that there was ‘only one farm controlled by this Department [of Māori Affairs] in the area, a small area of which is low lying and is drained to the lake; a considerable rise in the lake level will be required to affect this drainage.’ In his final paragraph he noted that ‘there is however a considerable area of Māori Land about 400 acres affected. The area is at present not intensively farmed it would however if the lake could be lowered come in as excellent land.’ Turnbull concluded that he had spoken to Hemi [Hema] Hakaraia in regards to the Māori land owners to also consider contributing to the drainage.[316] Hand written notes on the document by Mr Benson on the 12 April 1949 recorded that Hema Hakaraia of Rangiuru Road Ōtaki had ‘offered to get owners to contribute a quarter of the total cost up to £100 therefore a maximum of £25’. Benson then requested to ‘please authorise expenditure of £100 from subsidy grant to Works Dept. Copy to D[istrict]/Engineer Mr Haskell.[317]

This was then approved by the Under-Secretary of Māori Affairs on 19 April 1949.[318] The District Engineer replied on the same day that the work to open a cut of about 3

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314 Department of Māori Affairs Under-Secretary Draft Letter 11 April 1949. Lake Waiorongomai – Ōtaki – Lower of level. Archives New Zealand, Reference R21530230.

315 G.D. Turnbull Deparment of Māori Affairs Memorandum 11 April 1949. Waiorongomai Block: Horowhenua County. Lake Waiorongomai – Ōtaki – Lower of level. Archives New Zealand, Reference R21530230.

316 Ibid.

317 Ibid.

318 Department of Māori Affairs Under-Secretary Letter 19 April 1949. Lake Waiorongomai – Ōtaki – Lower of level. Archives New Zealand, Reference R21530230.

chains wide and 6 feet deep at the mouth should not exceed the £100.[319] He pointed out his concern though that the obstruction is likely to re-establish itself without local residents stabilising the area with planting. The Archives New Zealand records within this Lake Waiorongomai file continued a year later as there were discrepancies over the actual and estimated cost of £293, £1000 or £100 and the contribution then expected of the Māori owners.[320] The Under-Secretary of the Department of Māori Affairs then wrote to the Hon. Minister of Māori Affairs on 8 November 1950 that the Ministry of Works had advised that £100 would enable the work to be completed.[321] He referred to several Māori farms in the area of which one was administered by their Department under the provisions of the Māori Land Amendment Act 1936. The Under-Secretary recommended that the Māori concerned had undertaken to contribute £25, some of which had been recieved, and that funds could be provided from the £1000 which appeared in the estimated value and was entitled through 'Māori Land Settlement, Development of Māori Lands not included in Development Schemes Subsidies. To date, £293 only of the amount is already committed. Your approval of the expenditure of £100 from this vote is recommended.'[322] The work was subsequently subsidised.

These actions show that the desire of settlers leasing Māori owned land were thus able to gain a Crown endorsed subsidy to lower the level of Lake Waiorongomai. The work was at the time supported by a Māori owner and possibly others. Using the Crown process to develop Māori land in this case largely supported the settler values of increasing desirable lands for farming. It is questionable whether the Māori owners were aware at the time that the extensive drainage works intended to open the Waiorongomai Stream mouth would also largely impact on lowering the lake level and mahinga kai resources.

By 1978, the further subdivision of the 10 Waiorongomai blocks had resulted in the further severing of hapū and whānau ties as more of the smaller blocks began to be sold, as evidenced in Map 26 below. This map also shows that a considerable amount of the

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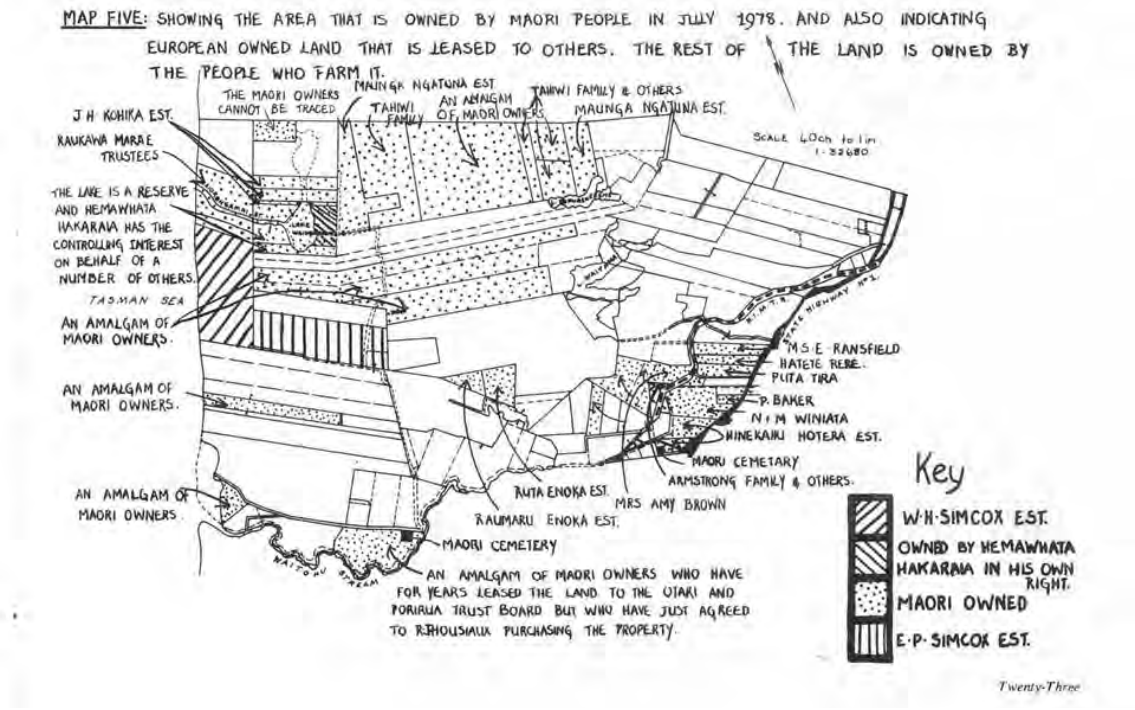
319 District Engineer C. Langbein Memorandum 19 April 1949. Lake Waiorongomai – Ōtaki – Lower of level. Archives New Zealand, Reference R21530230.

320 Notes 22-26 September 1950; Department of Māori Affairs Authority for Expenditure; Lake Waiorongomai – Ōtaki – Lower of level. Archives New Zealand, Reference R21530230.

321 Department of Māori Affairs Under-Secretary Letter 11 April 1949. Lake Waiorongomai – Ōtaki – Lower of level. Archives New Zealand, Reference R21530230.

322 Ibid.

Waiorongomai Block remained in Māori ownership whereas the Pukehou Block had been largely sold.



Map 26: **Waiorongomai and Pukehou Blocks showing Māori ownership in 1978.**[323]

The lakes today:

Rupene Waaka researched the Māori land ownership status for the original Waiorongomai Block (1963 acres). His results showed that the 3 hapū and 26 owners in 1869 had grown to 1,755 hapū members with ownership of 17 of the smaller subdivided Waiorongomai Blocks in 2014.[324] The blocks that remained in hapū ownership in 2013 included: Waiorongomai 1A, 2, 3A, 3B1, 3B2, 3B3, 4, 7D, 7E, 7F, 8A, 8B, 8F, 9A, 10, A, B (see Map 27).[325] The amount of land in these 17 blocks amounted to 1066 acres, approximately 54 per cent of the total land area of the original Waiorongomai Block.[326]

323 Farthing, p. 22.
324 Waaka, 11 January 2014, Slides 24 and 26.
325 Ibid, Slide 24.
326 Ibid, Slide 25.

Map 27: **Waiorongomai Blocks showing Māori ownership in 2013.**[327]

The incredible reduction in the size of Lake Kahuwera and the surrounding wetlands is evident today, as shown in Map 28. The major contributing factors have been Pākehā ownership and the value placed on the surrounding lands for farming and the grazing of stock.

Map 28: **Lake Waiorongomai Block10 and neighbouring blocks, 2013.**[328]

[327] Google Maps and Te Kooti Whenua Māori-Māori Land Court Website overlay, image captured by Cnes/Spot Image, Digits Globe, Horizons Regional Consortium, Horowhenua District Council, Kāpiti Coast District Council, Landsat, in ibid, Slide 29.

Waiorongomai Block 10 still remains a reserve to this today although its legal status changed on the 20th of March 2003. Through an application under the Te Ture Whenua Māori Act 1993, it was gazetted and "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."[329] The trust established at this time to manage whānau and hapū interests is called the Lake Waiorongomai 10 Trust.

Concerned by the ongoing drainage of Lake Waiorongomai, the burning of surrounding native bush, and cattle access into the lake and Stream by leasehold farmers, the whānau and hapū owners and trustees of Waiorongomai Block 10 decided on a course of restoration. The chairperson of the Trust (the late James Nicholls) and hapū members present at a hui in Taaringaroa, Raukawa Marae in Ōtaki on the 24th of November 2012 approved an initiative to start the restoration project and apply for funding to fence the Waiorongomai Block 10. Collectively the Waiorongomai Block 10 has approximately 700 owners, including a number of whānau trusts. The restoration area includes five adjacent land blocks: Waiorongomai 1A; Waiorongomai 3A; Waiorongomai 3B1; Waiorongomai 3B2 and Waiorongomai 3B3 (see maps above). 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, Māori Land Online website.[330]

These lakes exemplify the detrimental effects that a change in ownership and value-system has had on them and the surrounding wetlands. Lake Waiorongomai has reduced in size and in its stocks of fisheries while Lake Kahuwera no longer exists as a lake and has been reduced to a tiny swamp area. The loss of much of the sustenance, resources, recreation, and associated cultural practices once provided by these lakes has been a considerable loss to local hapū and whānau. The precious few lakes throughout the inquiry district that remain in Māori ownership are highly treasured.

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328 Modified from ibid, Slide 30.
329 New Zealand Gazzette, 3 April 2003, p. 913, in ibid, Slide 22.
330 Refer to www.Māorilandonline.govt.nz.

2.5 Issues of Ownership of Groundwater

The Tararua and Ruahine mountain ranges play an important part of the water cycle in the inquiry district. The precipitation that occurs in these ranges is the source of many springs and streams that feed the major rivers. Springs, groundwater, and surface water also feed water into lakes and lagoons. This section turns to address the ownership of springs that are an outlet for some of the groundwater in the district. Groundwater is becoming an important contemporary issue in the face of increasing levels of water abstraction for domestic and agricultural and horticultural use, and where small- and large-scale abstraction is increasingly from groundwater bores.

The Crown took control of the use of groundwater using powers it gained in the Water and Soil Conservation Act 1967 to grant water rights to abstract from wells and bores (although English common law rules, introduced by the English Laws Act 1858, already applied to groundwater ownership).[331]

Springs are a natural geomorphological feature in the Kāpiti-Horowhenua region. They are outlets for groundwater which has travelled through the substrate from the precipitation that regularly occurs in the Tararua and Ruahine mountain ranges. As discussed in the claimant interviews for the inland waterways cultural perspectives project, they are an especially important source of water for hapū and iwi in the inquiry district. Te Ahukaramū Royal, for example, talked of a spring in the Tararua ranges known as Pukemātāwai which is a source of mauri that feeds many significant rivers within the Raukawa rohe such as the Waikawa, Ōhau, and Ōtaki.[332] Rob Warrington highlighted a spring sacred to Muaūpoko in the Tararua Ranges named Hapūakorari which was taken by the Crown under the legislative mechanism of confiscating waste lands.[333]

David Alexander surmises that 'it is more likely to have been located in a block that was purchased by the Crown in the 19th century. Purchases at that time were notified as becoming Crown-owned by declaring them to be Waste Lands of the Crown. The spring

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331 Personal communication, David Alexander, appraisal received during the Draft Report feedback stage. Received via email from Nicola Kiri-Smith, Crown Forestry Rental Trust 5 July 2017.
332 Poutama, Spinks, and Raumati, p 139.
333 Ibid, p 129.

could be located on Horowhenua 12 Block (13000 acres of Tararua Range land declared Waste Lands of the Crown by NZ Gazette 1899).[334,335]

Lossy Maclean also talked of a Ngāti Wehi Wehi wāhi tapu spring near the beach that has been desecrated:

> 'I remember at the beach we had lovely, free flowing artesian water all the time… it was used for drinking, it was beautiful – where the public toilets are now at Waikawa Beach is where it used to be.'[336]

2.5.1 Case Study Five: Pirikawau Spring

In their wānanga for the inland waterways cultural perspectives project, Ngātiawa claimants raised the ownership of groundwater and a sacred spring named Pirikawau (Parikawau).[337] The historic map below shows its location. Apihaka Tamati/Pirikawau-Mack talked of the healing springs fed by groundwater being blown up to make way for the Waikanae Bridge. Further desecration occurred after a turf growing business polluted the groundwater under council consent. The site then became a reserve and in the 1980s a gargoyle was placed there which insulted their mana as iwi and tangata whenua of this site. The Kāpiti Coast District Council still currently owns the land with access to the sacred spring restricted to walking. The lack of vehicular access to the spring has been problematic for some kaumātua.

334 NZ Gazette 1889, p 1361.
335 Personal communication, David Alexander, appraisal received during the Draft Report feedback stage. Received via email from Nicola Kiri-Smith, Crown Forestry Rental Trust 5 July 2017.
336 Interview with claimants from Ngāti Wehi Wehi at Ngāti Wehi Wehi Marae, Manakau, 9 September 2016, in Appendix V.
337 Poutama, Spinks, and Raumati, pp 175-176.

Map 29: **Historic Inland Waterways with Tribal Ownership Recorded.**[338]

The railway bridge over the Waikanae River was built between 1885 and 1888, and the road bridge in 1901.[339] It was not clear from the interview which bridge had led to the desecration of the Pirikawau Spring or if indeed both had.

On the 26th of June 1884, members of Ngātiawa met with railway company representatives at the Rūnanga Building in Waikanae to discuss the Wellington to Manawatū railway.[340] Following the occasion, the Evening Post wrote an article noting that Wi Parata (b. 1835, d.1906), who was chief at that time, was present with nearly all the iwi members including men, women, and children.[341] After hearing the railway officials plans, and seeing the map Wi Parata replied that his iwi welcomed the railway which was envisaged to increase communication, trade, and bring "great good to his

338 Land Information New Zealand, in Maclean and Maclean, pp. 172-173.
339 Ibid, p. 51.
340 *Evening Post*, 30 June 1884, in ibid.
341 Ibid.

people".[342] Wi Parata included in his speech a stipulation that the iwi desired to maintain ownership of their lands and not subdivide:

> 'At the same time, he (Wi Parata) wished it to be understood that the tribe had resolved to hold their lands in tribal interest and allow no subdivision. Whatever boon the railway brought, was for the benefit of all. After two hours speechifying, Wi Parata stated that the tribe were agreed to give a free right-of-way for the railway – a distance of nearly seven miles-through their lands, and that he would on their behalf, sign an agreement to that effect.'[343]

Figure 18: **The first Waikanae River Bridge built between 1885 and 1888 for the Wellington and Manawatū Railway Company.**[344]

342 Ibid.
343 Ibid.
344 Levin Family Collection, Alexander Turnbull Library, cited in ibid, p. 174.

2.6 Issues of Ownership of Water

The Crown has enacted legislation enabling provincial governments, and later councils, to charge for the supply of water. For example, Rawhiti Higgott described the struggles Te Āti Awa have had with regards to charges for water rates. Historically, the New Zealand Railway Company had to pay Wi Parata for the use of water from Kakariki Stream in Waikanae. The situation is now reversed where their local iwi members, as rate payers, now also pay the Kāpiti Coast District Council for water rates.[345] André Baker concurred, describing his whānau Waitangi Tribunal Claim (1628) based on their tūpuna Matenga Baker who lost his land and papakāinga under the Rates Act because he refused to pay the County Council to use water. André continues to hold the same stance as his tūpuna today:

> 'That was all about water coming into the property and Matenga said why should we have to pay for that utility. Then in 2015 the Mayor and his Council decided they have the right to charge us for water. I can't agree with that. I can't give them my permission.'[346]

Research into the Ōtaki Borough Council archives shows Matenga Baker actively enquiring in 1949 about rate amounts on an Ōtaki property. Matenga Baker was also one of 10 noted in 1953 as returning water rate demands to the Ōtaki Borough Council.[347] Further details of this are in the draft local government report by Suzanne Woodley.[348]

Participants at the Te Reu Reu and Ngāti Kauwhata Wānanga highlighted grave concerns over the use of water and ownership rights asserted by local authorities and the Crown within their region.[349] In his interview for the inland waterways cultural perspectives project, Michael Cribb of Ngāti Kauwhata and Ngāti Turanga discussed the transferrable water rights that were created in his rohe for water take from the Oroua River.[350] This issue is discussed further in the Oroua River case study in Chapter 4.

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345 Poutama, Spinks, Raumati, p. 154.
346 Ibid, p. 156.
347 Box 6/17, Folder 159, #21, 20 August 1953.
348 S Woodley, *Draft Local Government Report* (Wellington: Crown Forestry Rental Trust, 2017), pp 350-355.
349 IWCP Wānanga held 12 May 2016 at Te Runanga o Raukawa, Feilding.
350 Poutama, Spinks, Raumati, p. 156.

The ownership of water continues to be an important issue in the contemporary context. In 2012, the Crown announced the sale of up to 49 per cent of three state-owned power companies. In response, the New Zealand Māori Council along with other iwi co-claimants filed two claims with the Waitangi Tribunal in relation to the ownership of fresh water: the National Freshwater Wai Claim 2200 and the National Fresh Water and Geothermal Resources Inquiry Wai Claim 2358.[351] The claims argued that:

> 'Māori have unsatisfied or unrecognized proprietary rights in water, which have a commercial aspect, and that they are prejudiced by Crown policies that refuse to recognise those rights or to compensate for the usurpation of those rights for commercial purposes.'[352]

In addition, the Māori Council argued that the Western concept of ownership is not a comfortable fit with the Māori idea of customary authority, leaving Māori with little choice but to claim English-style property rights as the only realistic way to protect their customary rights and relationship with their taonga waterways.[353] The Crown has continued to maintain its position that there can be no ownership of flowing water.[354]

Sir Taihākurei (Eddie) Durie, a kaumātua of Ngāti Raukawa, Ngāti Kauwhata, and Rangitāne reported that the Waitangi Tribunal agreed with the New Zealand Māori Council and supporting iwi, that Māori have a proprietary interest in water.[355] Indeed, the Waitangi Tribunal stated that:

> 'Our generic finding is that Māori had rights and interests in their water bodies for which the closest English equivalent in 1840 was ownership rights, and that such rights were confirmed, guaranteed, and protected by the Treaty of Waitangi, save to the extent that there was an expectation in the Treaty that the waters would be shared with the incoming settlers.'[356]

Durie's paper also proposed a framework for a law that recognised Māori proprietary interests in water. Durie stated that "Māori proprietary interests, whether in land or in

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[351] C Knight, 2016, p. 254.
[352] Waitangi Tribunal, The Stage 1 Report on the National Freshwater and Geothermal Resources Claim (Wellington: Legislation Direct, 2012), p 1.
[353] Ibid, p 32.
[354] Ibid, p 31.
[355] ET Durie, Law, Responsibility and Māori Proprietary Interests in Water, unpublished paper
[356] Waitangi Tribunal, 2012, p. 81.

water, were based on access to natural resources". He elaborated further explaining that access to inland waterways was secured by hapū that held the political authority in the district and could be allocated right down to individual use rights.[357] He thus defined Māori proprietary interests in water as:

> '(a) a family right of access to particular tribal waters for general and specific purposes, and
>
> (b) a tribal right to control its use by tribal members and others.
>
> The ownership is not in the water but in the authority to access it, to use it, to enhance its use through weirs and other contraption, and as a tribe, to control it.'[358]

The Freshwater Iwi Leaders Group, formed in 2007, is in ongoing negotiations with the Crown over the Wai 2358 claim.[359]

Although the Crown accepted that Māori have rights and interests in water, their preference is to strengthen the role and authority of Māori in future resource and environmental management processes, rather than engage in developing a framework for Māori proprietary rights.[360] Anthropologist Anne Salmond describes this as an example of ontological collision:

> 'In the European framework, water rights can be sold but no one owns the water. But in the Māori view (and as confirmed by the tribunal), the rights and interests that Māori had in their water bodies when the Treaty was signed involved the exclusive right to control access to and use of the water – what Europeans would call ownership or property rights.'[361]

Catherine Knight, a New Zealand historian with a passion for the environment, wrote that the Waitangi Tribunal bridged the ontological divide when it concluded that:

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357 ET Durie, Law, Responsibility and Māori Proprietary Interests in Water, unpublished paper, p. 4.

358 Sir Taihakurei Durie, Law, *Responsibility and Māori Proprietary Interests in Water*, unpublished report, p. 2.

359 http://iwichairs.Māori.nz/our-kaupapa/fresh-water/

360 J Ruru, *Māori rights in water: The Waitangi Tribunal's interim report*, 2012. Accessed from http://Māorilawreview.co.nz/2012/09/Māori-rights-in-water-the-waitangi-tribunals-interim-report.

361 A Salmond, *Rivers – Give me the water of life'*, 2014, Rutherford Lectures: Experiments across Worlds, held at Whanganui Opera House, accessed from www.royalsociety.org.nz.

> '…. most New Zealanders, if properly informed as to the nature of Māori rights, would not disagree that the owners of property rights should be paid for the commercial use of their property. Otherwise there would be no landlords and no tenants, no joint ventures, no commercial property arrangements of any kind. That seems to us to be absolutely basic to the way in which New Zealand society operates. We think that the Article 3 rights of Māori entitle them to the same rights and privileges as any other possessors of property rights.'[362]

Dennis Emery of Ngāti Kauwhata and Mike Joy, a contributing author of this report, presented evidence to support the New Zealand Māori Council and their claim to the Waitangi Tribunal. Emery provided historic and contemporary evidence of the ongoing tino rangatiratanga of Ngāti Kauwhata of the Oroua River evidence which will be discussed further in Chapter 4. Joy outlined to the Waitangi Tribunal the failings of the Crown in meeting its responsibility to protect water quality and provides specific local evidence of this in Chapter 6 of this report later in Part 2 of this report.

2.7 Concluding Remarks

As this chapter has made clear, the Crown has abjectly failed to uphold their guarantee of maintaining the rangatiratanga of hapū and iwi in the inquiry district over their inland waterways. Instead, the Crown legislated for the near wholesale transfer of hapū and iwi lands and associated waterways into private hands to support the development of pasture lands for farming and to support ongoing settlement. This has left many hapū and iwi with limited or no access to their taonga waterways, and with limited ability to learn and pass on important tikanga and mātauranga associated with these waterways. The transfer of lands and waterways in the inquiry district has also left many waterways degraded and polluted and unable to support the former abundance of aquatic life. In some cases, such as with Lake Kahuwera and Pirikawau Spring, these waterways are no longer in existence. The chapter has also made clear that where hapū and iwi have been able to retain a degree of ownership, degradation has been less severe.

> 'Everything in te ao Māori is intimate. Polluting or desecrating our environment is a breach of that relationship.'[363]

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362 Waitangi Tribunal, 2012, p 137.
363 Personal communication, Rawiri Kiriona, 6 February 2016.

Despite Crown failures, hapū and iwi in the inquiry district continue to attempt to assert their rangatiratanga of their inland waterways and to give expression to this as kaitiaki to maintain them into the future.

> 'Throughout the inquiry district not many hapū or iwi are able to exercise tino rangatiratanga or even kaitiakitanga over taonga tuku iho.'[364]

[364] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage 4 June 2017.

3. FLOOD CONTROL AND GRAVEL EXTRACTION

3.1 Introduction

In a Māori worldview, inland waterways, mountain ranges, and the vast biodiversity of species are intertwined and not separated into distinguishable parts.

> 'Like all other elements of the natural environment, rivers possessed mauri (a life force). The interactions of tangata whenua with the awa over which they exercised mana (authority) were guided by the need in preserve and maintain its mauri – to protect both the health of the river itself and the wellbeing of the people who depended on its resources.'[365]

This chapter details the drainage interventions undertaken by local authorities from the late 1800s to control flooding in the inquiry district. These interventions failed to appreciate the inquiry district as an inter-connected floodplain which exacerbated flooding and led to more radical modifications which have had further significant consequences on the district's waterways and on hapū and iwi.

> 'When the natural resources of Papatūānuku are exploited rapidly for purely economic gain the natural fluctuating balance of the environment is offset.'[366]

One such flood control intervention has been the extraction of gravel from many of the district's major rivers and streams: Waikanae, Ōtaki, Ōhau, Waitohu, Rangitikei, Oroua, Makowhai, and others. This has developed into a profitable industry in the inquiry district which has had both an environmental impact and has been the source of yet another grievance for hapū and iwi to address. There was little evidence throughout the inquiry district of royalties or profits from these enterprises being paid to iwi or hapū. There was also little or no historic evidence of any national or local government incentivising Māori into the private gravel extraction industry.

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[365] C Knight, *New Zealand's Rivers: An Environmental History* (Christchurch: Canterbury University Press, 2016), p 29.

[366] Personal communication, Lindsay Poutama, 2 March 2017.

3.2 Transformation of the Waterscape for Farming and Settlement

Up until the land alienations of the late 1800s, rivers and streams in the inquiry district meandered in their natural state. River systems in particular were very dynamic, crossing vast areas of the landscape. Modification of water bodies by hapū and iwi was small-scale, with some streams artificially blocked or created for the cultivation of tuna – including the erection of whakamate or tuna trapping channels.[367]

In December 1841, the Surveyor-General journeyed from Wellington to the Manawatū detailing the nature of the landscape along the way. He marvelled at its richness and potential for growing crops; admired the numerous streams of excellent water – particularly the Waikanae, Ōtaki, and Ōhau; and noted the immense totara and the abundance of flax in the Manawatū River area.[368] Not only were there totara throughout the inquiry district, but also nikau, karaka, matai, kauri, and rimu.[369]

The first major transformation of the waterscape was deforestation. An article in the Wanganui Herald in 1882 lamented that rapid deforestation would see the entire country denuded within 25 years and that its result would be a climate so deteriorated that agriculture and grazing would no longer be possible under the favourable conditions that had hitherto prevailed.[370] In the inquiry district, mass deforestation began in earnest following the opening of the railway line from Wellington to Manawatū in 1886. In some areas, the process of turning forests into farms and towns was "something of a race as sawmillers tried to secure all the valuable timbers before farmers burned it."[371]

Not only did deforestation destroy much of the vast habitat of many species of native birds which were another key food source for hapū and iwi, it also increased erosion. The deposition of organic material into rivers, streams, lakes, and lagoons (known as aggradation) caused their beds to lift. Moreover, without forests to soak up rainfall, more of it ran into waterways. As early as 1897 heavy rainfall along the Ruahine and Tararua ranges resulted in the flooding of the Rangitikei, Oroua, Pohangina, and Manawatū rivers.

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367 GL Adkin, *Horowhenua: Its Māori Place Names and Their Topographic and Historical Background* (Wellington: Department of Internal Affairs, 1948), pp 25-30.

368 Visit of the Surveyor-General to the Manawatū, in *New Zealand Gazette and Wellington Spectator*, Volume II, Issue 102, 29 December 1841.

369 D Harris, 'Levin's Treefellers', in *The Horowhenua-Kāpiti Chronicle*, 2000.

370 'Forest Preservation', in *Wanganui Herald*, Volume XVI, Issue 4664, 9 May 1882.

371 A Dreaver, *Levin: The Making of a Town* (Levin: Horowhenua District Council, 2006), p 31.

> ‘One of the causes of the rapid and serious flooding of these rivers must be the fact that the bush was cleared off the high lands and ranges inland, with the natural consequence that the water gets away rapidly from the gullies resulting in floods in the rivers as the waters come together.’[372]

This resulted in the newly constructed bridges and roads being washed out in gorges and the loss of large amounts of riparian land throughout the floodplains.[373] As land was further developed for farming and settlement, flood control became a major issue for councils in order to protect lands and infrastructure from such loss and damage.

In parts of the inquiry district widespread flood control measures were delayed to some extent by the success of the flax industry, located in and around large swamp lands, which operated from the 1860s through to the 1930s. Instead of a problem to be controlled, the flooding of river waters over their banks and into swamps was beneficial for flax growth. In the early 1900s, “yellow-leaf” disease became a major problem for the industry and so too did the decline in demand for flax fibre following the end of World War I.[374]

As the sawmilling industry declined due to a lack of resource material, and the flaxmilling industry began to collapse due to the availability of cheaper alternatives on the world market, greater attention turned to the agricultural industry. As a consequence there was an intensification of swamp and wetland drainage within the inquiry district to convert them to pasture lands for farming. These extensive historic wetlands, illustrated in Map 30 below, once helped soak up major flood events.[375]

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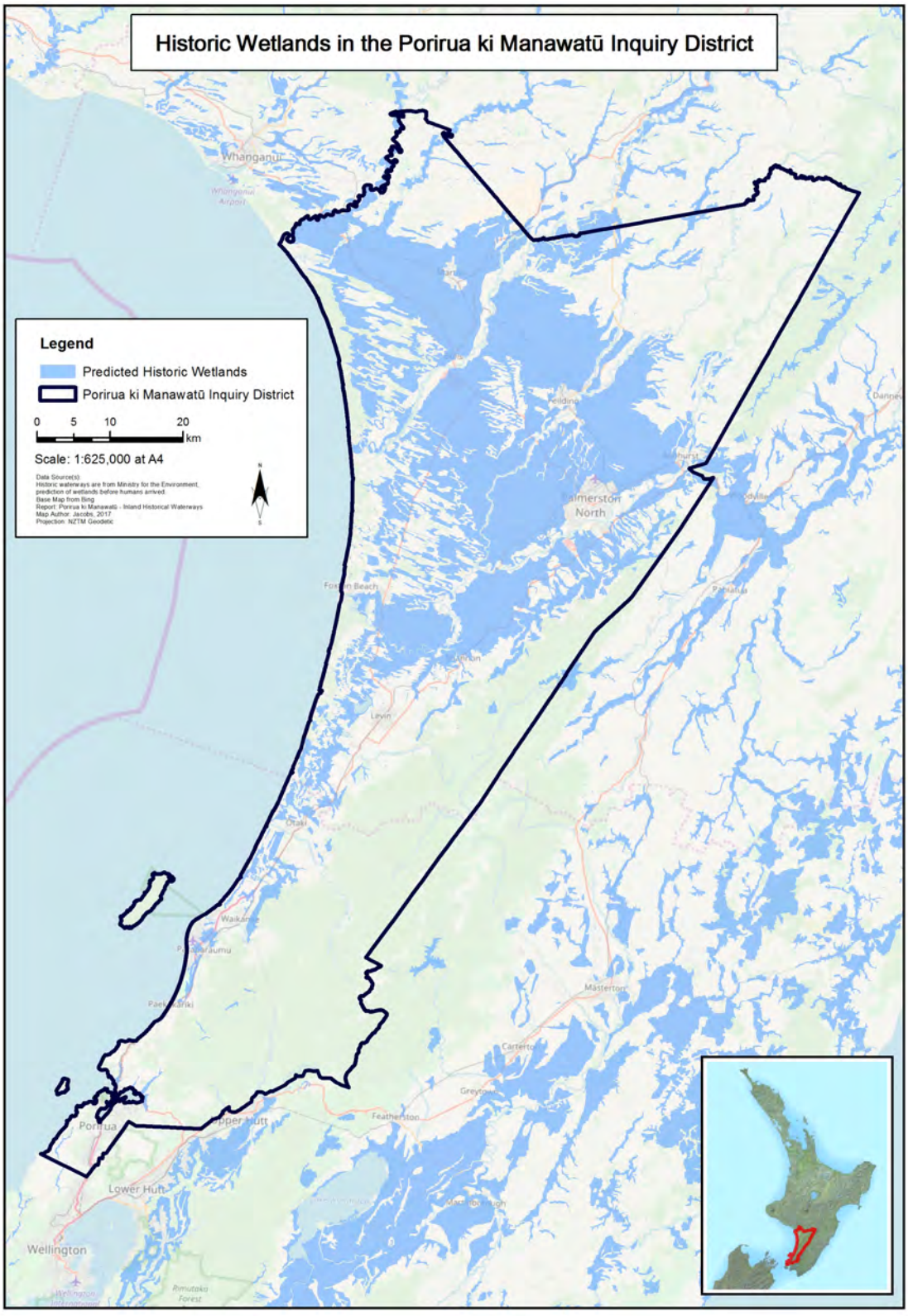
372 ‘The Recent Floods’, in *Feilding Star*, Volume XVIII, Issue 243, 17 April 1897.
373 Ibid.
374 Anonymous, ‘Bridling a River: Works on the Manawatū: Dairying Replaces Flax’, in *Manawatū Standard*, Volume XLIII, Issue 537, 25 October 1922.
375 C Knight, *Ravaged Beauty: An Environmental History of the Manawatū* (Auckland: Dunmore Publishing, 2014), p 233.



Map 30: **Historic wetlands in the Porirua ki Manawatū Inquiry District.**[376]

[376] Created by Jacobs courtesy of Crown Forestry Rental Trust.

Wide-spread drainage, coupled with deforestation, thus had a significant impact on the regions once high flood carrying capacity,[377] and have contributed to catastrophic flooding damage when large storms have hit the region – including the notable flood of May 1904. The photograph below was taken of the Manawatū River during this flood. As described by I.R. Matheson:

> 'The buildings in the middle distance are those of Mardon Bros. Flaxmill, a one-stripper mill situated on the right (east) bank of the Manawatū River, about 2 and a half miles downstream from the mouth of the Oroua River. The flooded area in the foreground is part of the fibre drying paddocks. The Mardon brothers (Jack, Fred, Charlie and Harry) erected this mill in 1898 and ran it until 1905, when they shifted the mill to Oroua Bridge (now called Rangiotu).'[378]

Figure 19: **Manawatū River flooding photograph taken by Edward George Child, 1904.**[379]

[377] M Baker in, *Nga Korero Tuku Iho Wai 2200*, Whakarongotai Marae, Waikanae, 22 April 2015, pp 153-154).

[378] IR Matheson, Personal communication, Letter dated 5 March 1968, 6/1. Extract from a note on the back of the file. Manawatū River in flood. Palmerston North Public Library: Photographs of Palmerston North. Ref: 1/1-001978-G. Alexander Turnbull Library, Wellington, New Zealand. http://natlib.govt.nz/records/23237296

[379] Palmerston North Public Library: Photographs of Palmerston North. Ref: 1/1-001978-G. Alexander Turnbull Library, Wellington, New Zealand.

In 1923, another major flood event saw the Ōtaki River taking out the Waitatapia Bridge in Ōtaki Gorge. The Rangiuru Stream had water as high as the fence tops, and the ford over the Waitohu River was impassable.[380]

3.3 Interventions to Control Flooding

During his 1845 visit to the Oroua district, Mr Jerningham Wakefield wrote about the flooding of the Oroua River.

> 'The district through which the Oroua runs is of the richest alluvial character, being subject to very high floods. When we descended it, the water was in most places 10 feet below the top of the bank; but there were abundant marks of recent inundation on the trees to the height of three feet above the ground. A scanty population reaps a plentiful and easy harvest from some chosen spots along the immediate banks; retreating to the pa or to elevated spots when the waters rise.'[381]

Not only did the forest cover (and the extensive wetland areas as noted above) provide a means of flood control, Māori settlements were well able to adapt to the changing environment. Perhaps in light of this, no historical evidence was found of major constructions to control flooding by Māori within the inquiry district.

Town planning was in its infancy throughout New Zealand in the 1800s and many Pākehā villages and townships within the inquiry district were also located near rivers and river mouths that were prone to flooding. In order to protect the new townships from flooding and to protect productive crop and farm lands, the River Boards Act 1884 and the Land Drainage Act 1893 were passed to establish and empower river and drainage boards.[382] Interventions for flood control, however, began in earnest in the inquiry district in the early 1900s.

The Crown gave primacy to flood protection since the River Boards Act 1884. The Land Drainage Act 1893 encouraged farming on low-lying land and maintenance of waterways at lower water levels, thereby increasing the pressure on River Boards to perform. The River Boards were local organisations with a limited perspective, and hamstrung by an

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380 *Floods in Ōtaki District*, Waihi Daily Telegraph, Volume XXXI, Issue 6850, 27 February 1923.
381 Wakefield, 1845, pp. 235-36, in Knight, 2016, p. 36.
382 AL Bennett, *The Good Fight: Power and the Indigenous Struggle for the Manawatū River*, unpublished PhD thesis, Massey University, Palmerston North, 2015, p 36.

inability to deal with a bigger picture. An attempt to deal with flood protection (including river diversions) on a bigger scale was provided by the Manawatū-Oroua River District Act 1923, as a one-off dealing with 73,000 acres. The Crown went further with the passing of the Soil Conservation and Rivers Control Act 1941 allowing for the formation of Catchment Boards to consider the needs of whole catchments. The Catchment Boards were quasi-government organisations, whose membership was a mix of Crown appointees and locally elected representatives of ratepayers. It is important to emphasise that the Crown exercised strong control over the activities of Catchment Boards, first by the powerful presence of its own appointees at the Board table, and second by providing central government monies in the form of subsidies to complement locally raised rates) only to works that it approved. The standard Crown response that local authorities do not have to honour the Treaty is rebutted by the extent to which the Crown worked hand-in-glove with Catchment Boards. Manawatū Catchment Board was constituted by NZ Gazette in 1943,[383] with ten locally elected members NZ Gazette 1944.[384] The absence of safeguards for tangata whenua is a significant feature running through all of these legislative provisions.[385]

Indeed, over the following decades and up to the present day, these boards (and later catchment boards followed by regional councils) have undertaken a large number of flood control interventions across the inquiry district, investing significant sums to protect farm lands – as shown for example in the Manawatū Catchment Board Annual Reports of Chairman and Statement of Accounts for the periods 1945-1962,[386] 1963-1975,[387] and 1976-1985.[388] On occasion, additional rates levies were generated to fund the costly engineering works for flood protection and drainage schemes. The cost of engineering works detailed in the available reports were as follows:

383 NZ Gazette 1943, p 973.
384 NZ Gazette 1944, p 689.
385 Personal communication, Emma Whiley of Bennion Law on behalf of Wai claimants Muaūpoko Tribal Authority, email received during the Draft Report feedback stage 20 June 2017.
386 Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period (1945-1962; Feilding Central Archives, File HRC 00005:1, pp. 1-17.
387 Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period (1963-1975; Feilding Central Archives, File HRC 00005:2, pp. 1-48.
388 Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period (1976-1985; Feilding Central Archives, File HRC 00005:1, pp. 1-2.

- for the 1953/54 year, of the total expenditure for engineering works of £91,622, an expensive programme of works was undertaken due to urgent flood damage work, costing £51,377;
- for the 1954/55 year, the flood damage work and maintenance works cost £30,651 and River Scheme works on the Ōtaki, Mangatainoka, Upper Manawatū, Burke's Drain Floodgate to Hokowhitu Stopbank cost £33,609;
- for the 1956/57 year, the river works including flood damage and maintenance cost £90,211, which included new works for the Waikanae River and the Mangaone Drainage District;
- in 1957/58, they cost £87,820; and
- for 1960/61, the cost of all works and maintenance for all River Schemes was £383,653 of which a subsidy of £312,352 was received, with £47,957 coming from rates and private contributions.[389]

Major floods were noted in various of these reports, including the "extremely high flood" at the end of January 1953 which required months of work to remedy the widespread damage it caused to river works[390]; and two floods on the Ōtaki River mentioned in the 1961 annual report, and three on the Manawatū and Mangatainoka Rivers, which resulted in £20,000 worth of damage on the Manawatū River.[391] The position of the chairman of the Manawatū Catchment Board was that if protection maintenance works were not continued,

> 'the rivers would quickly revert to the state there were in in the early 1940s and before, with severe flooding that affected the land in those days and with the high loss of production and capital'.[392]

The flood damage in 1964/65, including three very large floods, created severe damage to the engineering works that had been undertaken by the Manawatū Catchment Board, costing over £100,000; however the chairman noted that without the protection work undertaken, the damage to farm property would have been,

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389 Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period 1945-1962; Feilding Central Archives, File HRC 00005:1, pp 6-12.

390 Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period (1945-1962; Feilding Central Archives, File HRC 00005:1, p. 5.

391 Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period (1945-1962; Feilding Central Archives, File HRC 00005:1, p. 16.

392 Ibid.

> ‘incalculable, as not only would there have been property and stock losses, but some 50,000 to 60,000 acres of productive farmland would have been out of production for many months’.[393]

Notably from these reports, it is evident that the ‘preservation of productive farmland’ for income generating purposes was the primary purpose of the activities of the Manawatū Catchment Board.

What is also notable about these reports is that at no time were the interests of hapū and iwi considered or even mentioned – either as landowners or as tangata whenua with authority over the very waterways the drainage schemes were obliterating. Instead, the vision of a productive and lucrative farming landscape prevailed. Even where ratepayers voted down drainage scheme proposals, various councils worked together to fund these schemes anyway.[394]

3.3.1 River Catchment Boards

River catchment boards were set up to combat the damage caused by major flood events. Notably they were able to take land without the agreement of owners, and dam, divert, or take water, as well as change the course of any stream or river – all under the auspices of flood protection.

Subsequent legislation that further empowered river boards to modify and obstruct inland waterways often provided no reference to tangata whenua or made provision for their ongoing customary use. For example, the Manawatū-Oroua River District Act 1923, section 11 stated that:

> ‘(1) No person and no local authority, save as herein provided, shall make, erect, or maintain anything that will obstruct or will be likely to obstruct the free flow of flood-waters over any land within the district unless with the written consent of the River Board.

[393] Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period (1945-1962; Feilding Central Archives, File HRC 00005:2, p. 19.

[394] See for instance, Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period (1945-1962; Feilding Central Archives, File HRC 00005:2, pp. 6 and 32.

(2) In case any such local authority desires to do all or any of the matters in this section specified it shall give not less than fourteen days' notice to the River Board, and therewith shall supply full particulars of the work to be carried out.'[395]

The 1923 Act was created to:

'make provision for the improvements of the waterways of the Manawatū River and the Oroua River, and for the protection from damage by water of certain lands in the Wellington District'.[396]

The statement 'certain lands' were targeted towards land considered valuable by Pākehā farmers. Within the 1923 Act is a reference in section 40 (1) to the consideration of interference to railways which are stated to be the property of 'His Majesty the King',[397] and ratepayers are mentioned in sections 31-34 for the purposes of determining rates for those receiving the benefits of works carried out by the Manawatū-Oroua River Board.[398] Notably there is no reference to tangata whenua or consideration of the impacts on customary use via the work carried out or approved by the River Board. Indeed, under such legislative instruments hapū and iwi were prohibited from erecting and using modifications such as whakamate to trap tuna.

Crown Acts conferred the power under which decisions were made and actions undertaken in the Manawatū-Oroua River District. In 1926, the Crown-established District Commission investigated and made recommendations with regards to the contributions by certain local bodies to the Manawatū-Oroua River Board. The report from the Manawatū-Oroua River District Commission 1926 to His Excellency General Sir Charles Ferguson, Bart., Governor-General of the Domain of New Zealand, referred to the proportion of operations carried out as proposed under powers conferred by Manawatū-Oroua River District Act 1923 or by Manawatū-Oroua River District Amendment Act 1925.[399]

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395 Manawatū-Oroua River District Act 1923, Section 11, p. 9.
396 Ibid, p. 2.
397 Ibid, p. 19.
398 Ibid, pp. 14-17.
399 Report from the Manawatū-Oroua River District Commission 1926 to His Excellency General Sir Charles Ferguson, Bart., Governor-General of the Domain of NZ. Archives New Zealand, Wellington. R19731740, Report of the Commission relative to contributions by certain local bodies to the Manawatū-Oroua River Board – 27 Oct 1926, Registered file ref 19/165/11. File 116/1.

The cost of operations of the Manawatū-Oroua River Board was also the second subject of investigation and recommendations of the aforementioned Crown-established District Commission. It was the view of the Manawatū-Oroua River Board of the Public Works Department that the government benefited from Board operations and thus the government should contribute to the cost of operations. The ways in which the government benefited were outlined in the report.[400] The Commission concluded in its report to His Excellency General Sir Charles Ferguson, Bart., Governor-General of the Domain of New Zealand on 28 May 1926 that the government benefited from the River Board's operations and that the government should thus contribute to their costs of operation by the amount of £201,041.

The Commission identified ways in which the government benefited including increased population, benefit to property, highway improvement, benefit to railway, and lessened settler demands, and that it should therefore contribute 8/14ths of the costs plus an amount towards the cost of alternative bridge replacement that it would otherwise have had to pay for. However, the Commission also stated that the government was not responsible for costs of maintenance.

A third inquiry by the District Commission into the Manawatū-Oroua River Board related to the contribution of the Board to protection works carried out or proposed to be carried out by Makerua Drainage Board within the Manawatū-Oroua River Board district under its jurisdiction.[401] The Commission operated under an extended warrant to November 1926, and in its report it found that the River Board did benefit and therefore should contribute towards costs.

These Commission reports clearly identified the role of the Crown in the activities and River and Drainage Boards, and that they directly benefited from the activities carried out by these Boards, under the authority vested in them by the Crown through various Acts of Parliament.

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400 Report (pages 1-12), dated 28 May 1926, of District Commission re. allocation of cost of operations of the Manawatū-Oroua River Board, including the government's share of said costs. Archives New Zealand, Wellington. R19731740, Report of the Commission relative to contributions by certain local bodies to the Manawatū-Oroua River Board – 27 Oct 1926, Registered file ref 19/165/11. File 116/2.

401 Report of the third inquiry by the District Commission into the Manawatū-Oroua River Board's contribution to protection works carried out or proposed to be carried out by Makerua Drainage Board. Archives New Zealand, Wellington. R19731740, Report of the Commission relative to contributions by certain local bodies to the Manawatū-Oroua River Board – 27 Oct 1926, Registered file ref 19/165/11. File 116/3.

3.3.2 Drainage Boards

The Land Drainage Act 1893 and its subsequent amendments enabled the establishment of drainage boards and empowered them to construct drains to prevent the overflow of waterways onto lower lying lands. The numerous legislative instruments pertaining to land drainage are detailed further in Chapter 5.3.1

Both river and drainage boards held the status of local authorities and, as such, members were governed and elected by ratepayers. These boards were able to levy rates and raise considerably large loans to pay for flood protection works as well as select and pay the contractors to conduct the work. Māori were often the labourers working on building stop banks and digging drains to earn a living.[402]

As outlined in the previous chapter, and the case study on Lake Waiorongomai and Lake Kahuwera in particular, drainage was particularly encouraged as agriculture and settlement expanded across the inquiry district. The large-scale drainage of lakes and wetlands had an immense impact on the fisheries and bird life that hapū and iwi depended on for sustenance and trade – and as noted above, significantly reduced the flood load capacity of the region.

Archival searches found much correspondence between Pākehā farmers and local government authorities and the associated river and drainage boards, sometimes involving legal representation, which resulted in the recognition of their rights and increased compensation – but very little that provided evidence of the recognition of the ownership and customary use rights of Māori.[403]

Land drainage as a form of flood protection remains a major part of the core business of district councils, with Horizons Regional Council stating on their website that it is:

> ‘paramount to our role in keeping communities safe in our region and forms a major part of our business. Managing rivers through engineering works allows us to help prevent floods and provide adequate land drainage where necessary.

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402 AL Bennett, 2015, p 36.

403 Archives Central in Feilding that holds records for the Horowhenua, Kiwitea, Manawatū, Oroua, Pohangina, and Rangitikei County Councils and associated borough councils; Ōtaki Borough Council and Waikanae Borough Council records at the Kāpiti Coast District Council offices in Paraparaumu; as well as National Archives in Wellington.

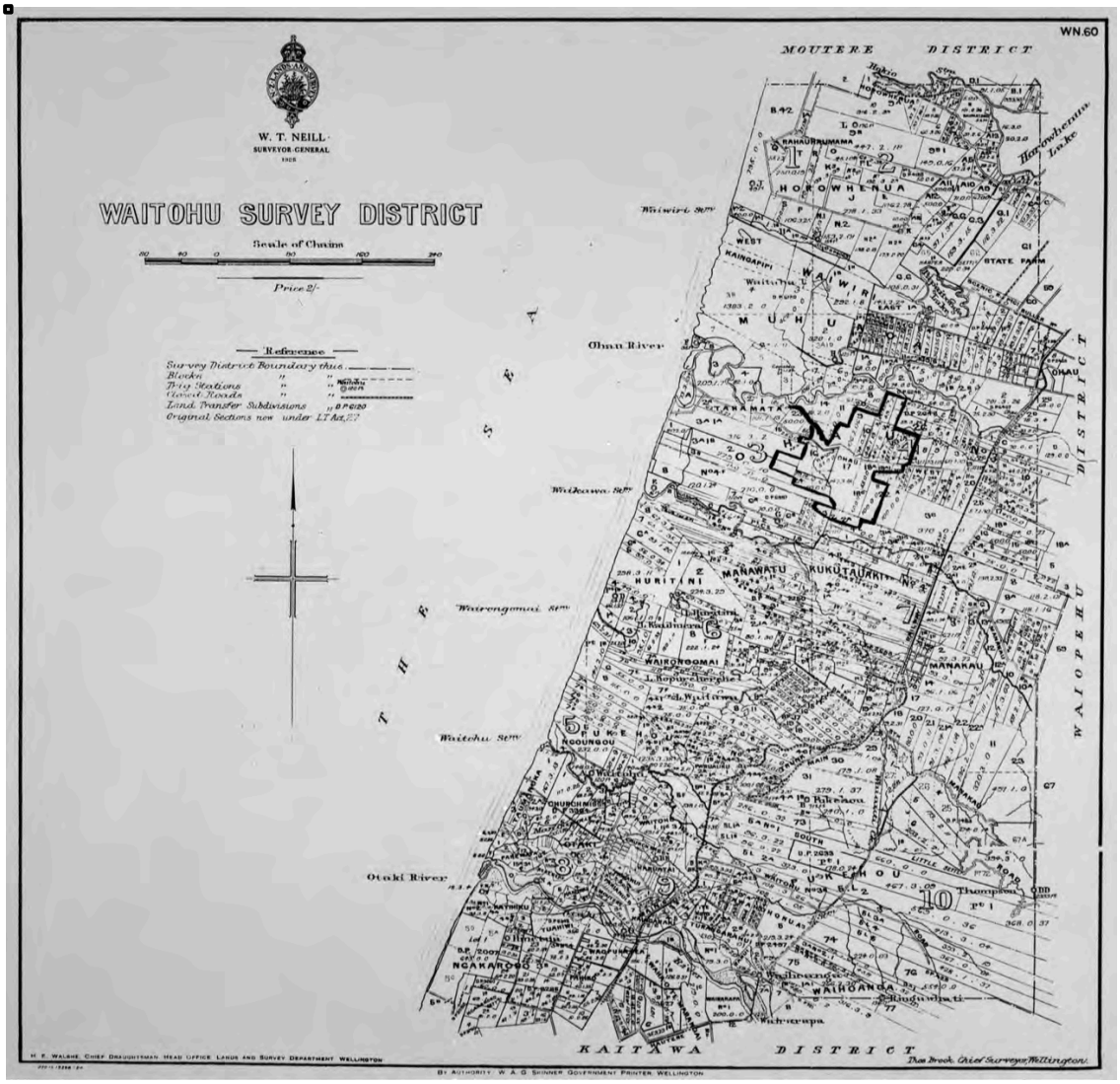
> All ratepayers in the region contribute to flood protection. However, those who live within a Scheme area pay an additional direct rate for the protection they receive. A Scheme is a designated area of land that receives protection from flooding, riverbank erosion and channel movement, and can also include land drainage services. Currently, 71,000 hectares of land and 10 urban areas are included within Scheme areas.'[404]

This is discussed further in the following case study on the Kuku Drainage Scheme.

3.3.3 Case Study Six: Kuku Drainage Scheme[405]

The Kuku Water Race District was established in 1908 to address surface water movements in the Kuku area.[406] Research identifies that the drainage work of the Kuku Drainage Board for non-Māori lessees of land in Kuku, commenced in 1927 and concentrated on controlling the flooding of inland streams and springs. The drainage board converted to the Manawatū Catchment Board in 1963, and continued to control, modify and channel natural waterways. Map 31 below shows land blocks and coastal areas of the Ōhau River, Tahamata, Waikawa, Huritini, Waiorongomai, Waitawa, Pukehou, and Ngoungou to the Waitohu Stream. The Kuku Drainage District is marked in bold further inland.

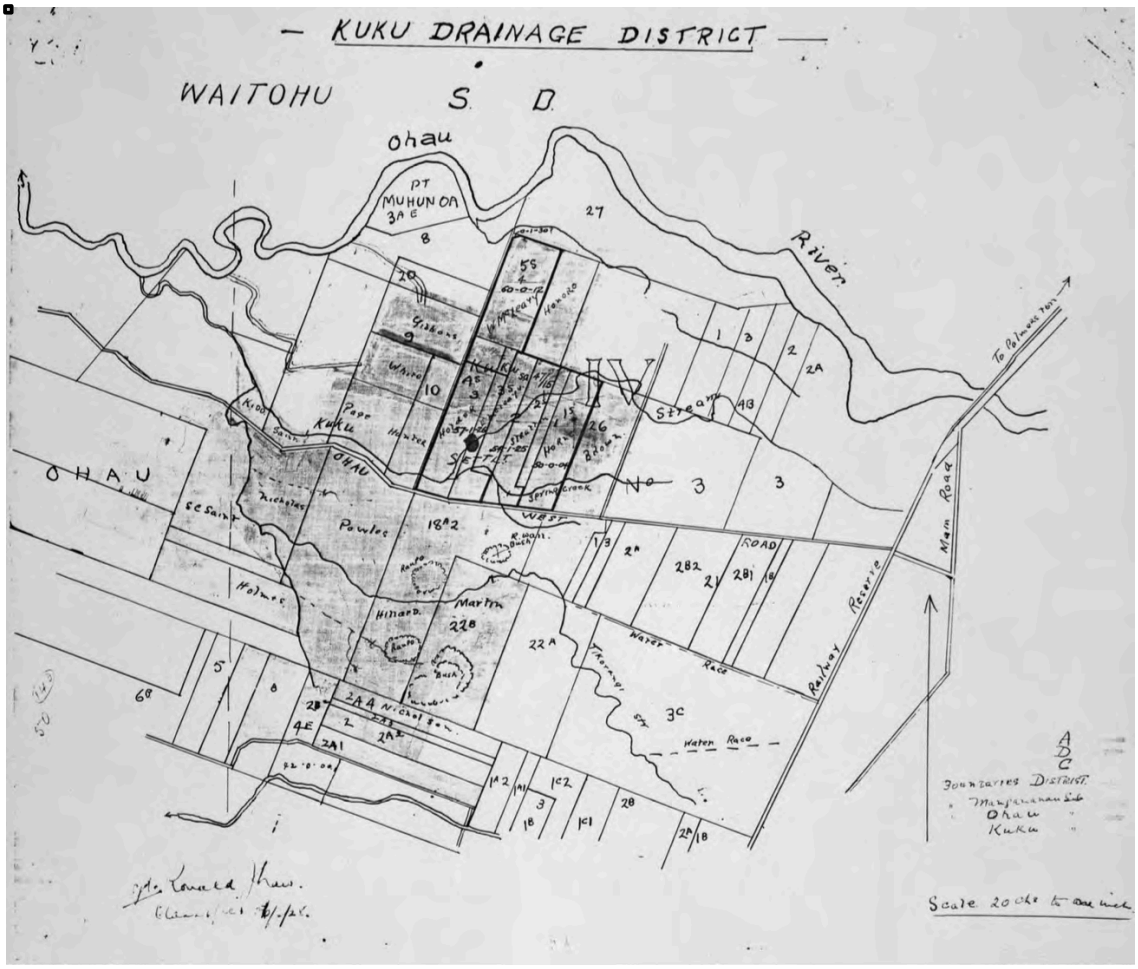
404 http://www.horizons.govt.nz/flood-emergency-management/flood-protection.
405 This case study was written by Associate Professor Huhana Smith.
406 Archives Central File, A/2012/3:205.



Map 31: **Waitohu Survey District cadastral map, 1925.**[407]

The impacts of drainage are evident in the Kuku-Ōhau region where the coastline falls within the western dune belt. While it has remained a dynamic place of regular, sweeping coastal dune accretion and erosion, in earlier times dune advances north of the Ōhau River overwhelmed coastal forest and areas of human habitation.

407 Image supplied by Central Archives, Feilding.



Map 32: **Kuku Drainage District showing different farms settled from 1913-1920.**[408]

After settlement in the early 1820s, Ngāti Tūkorehe would alter the land they settled with clearings in the tōtara forests for cultivations of communal sustenance and later tradeable commodities. In the late nineteenth century to early twentieth century, non-Māori communities would begin to more dramatically change the landscape to suit an intensified agricultural means of production, to support an agri-economic way of life.

While both Māori and later communities would come to shape the land they occupied in the coastal plain, the lands they drew sustenance from subsequently shaped their communities. Initially mana whenua or iwi and hapū authority over lands and waterways determined best sustainable use of natural resources. But later sustainable use was determined by economic aspirations of farmers who had acquired land blocks, either by lease or by purchase. In time, Māori developmental opportunities too would consolidate

[408] Image supplied by Central Archives, Feilding.

Māori owners' shares, for the development of lucrative dairy farms in the district,[409] including Tahamata Incorporation in Kuku and Incorporation of Ransfield's in Waikawa.

According to research compiled by John Rodford Wehipeihana in 1963:

> 'In 1914, the area in Kuku under bush was only one quarter what it had been in 1890. Trees were felled and burnt and the ashes sown with English varieties of grass e.g. cocksfoot, clover. Swamp drainage, an extensive and expensive undertaking, was not carried out in Kuku in the first part of this period. The fact that the swamp zones were owned by a group of impecunious, easy-going Māoris helps to explain this lack of economic development.'[410]

Within the decades of intensive clearing of natural forest cover between 1890s and early 1930s, the dune system Te Hākari (Hakiri) wetland may have been regarded as "underdeveloped" because its extensive resources were still in use by hapū for housing, weaving, medicinal resources, health, general well-being and sustenance. 'Impecunious' is a term that relates to a 'cash poor' status.

The mana or authority of earlier generations in Kuku to Waikawa and their reality as essentially land retainers, helped define a form of significant cultural wealth, mana and standing. Of particular local interest was the horseracing track that encircled Te Hākari wetland. The racetrack was a called Te Wiwi, aptly named after the sedge grass that grew in abundance there. Mr Rod McDonald dedicated a chapter to racing in his book *Te Hekenga: Early Days in Horowhenua*, where he recounted the readily adopted sport of horse racing by local Māori. Ngāti Raukawa, Ngāti Toa Rangatira and Muaūpoko were all very active participants in racing as owners, riders or gamblers in Ōtaki, Foxton, with the Ōhau track around the wetland well described.[411] These recollections aligned with later reminiscences of an important informant Mrs Maire Johns who recalls the times she was taken to race meetings by her father Whareao Seymour as a very small child in the

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409 S Smith, 2007, Hei Whenua Ora: Hapū and Iwi Approaches for Reinstating Valued Ecosystems Within Cultural Landscape, Unpublished PhD, Massey University, Palmerston North, p 88.

410 JR Wehipeihana, *Sequent Economies in Kuku: A Study of a Rural Landscape in New Zealand*, Unpublished Master's Thesis, Master of Arts in Geography, Victoria University: Wellington, 1964, p 33.

411 RA McDonald and E O'Donnell, *Te Hekenga: Early Days in Horowhenua* (Palmerston North: GH Bennett & Co Ltd, 1929), p 7.

late 1920s to early 1930s.[412] At that time as well, another informant recalled that the most invasive vegetation in the area appeared to be farm escapees from across the river such as gorse, boxthorn and lupin growing amongst the swathes of harakeke, stands of kahikatea, the odd karaka tree and the innumerable tī kōuka.[413]

3.3.4 Stopbanks

Stopbanks were another mechanism introduced by councils and the agricultural industry to control flooding and protect farming interests by diverting and often straightening river water courses. These were and continue to be large and expensive schemes on the major rivers in the inquiry district, including the Manawatū River, Oroua River, Ōhau River, Ōtaki River, and the Waikanae River – and often their tributaries also. Much of the stopbanking along the Manawatū and Oroua Rivers was completed by the mid-1960s.[414]

In 1992, Wehi and Hira Royal of Ngāti Raukawa ki te Tonga voiced their concerns about the ecological impacts created by stop banks on the Ōtaki River:

> 'All our families were brought up on the Ōtaki River… The river mouth used to be very wide, now it is very narrow. Prior to the stopbanks the river was free flowing, took its own course, and was fairly wide; flooding wasn't really a problem then. The stopbanks have also altered habitats and caused a loss of species... and have had hugely detrimental effects…. Decisions have been made without knowing species activities and the impacts on them…. The river is like an old man, it should be left alone to do what it wants.'[415]

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412 Personal communication with Mrs Maire Johns [date]. Whareao Seymour was the son of Ngaunuhanga and John Seymour, an Irishman. John wanted to take Ngaunuhanga back home to Ireland. She did not want to leave so he vowed he would sort business out there and return. Unfortunately he died in Ireland.

413 Personal communication with Mrs Ruhia Martin [date]. According to childhood memories the coastal area was cleared and drained from around the late 1920s to 1930s. She would have been around 5-6 years of age, as her earliest memories of harvesting or fishing excursions were taken with her grandparents. She lived with her grandparents Ani and Tumeke Wehipeihana in the Kuku homestead at this time.

414 Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period (1945-1962; Feilding Central Archives, File HRC 00005:2, pp 2, 6.

415 Wehi and Hira Royal interview at their home, Raukawa marae 22 September 1992, Te Rūnanga-o-Raukawa response to Wellington Regional Council contract entitled: Ōtaki River Floodplain Management Plan, Tikanga Māori. Cited in Āneta Rāwiri, *Restoring mātauranga to restore ecosystems*, p 6.

In 1992, Members of the ART Confederation of iwi also voiced their concerns about the detrimental effects of flood protection on the Ōtaki River including the obliteration of sacred urupā:[416]

> 'The river has altered considerably over the last 20 years and much Māori land has suffered. The movement of the river has started to erode away Mukukai urupā and exposed bone… The river now has an artificial mouth which has affected the run of certain fish species; the spawning grounds of many species have been wrecked. Spawning areas should be protected. Fishing should be banned in breeding seasons.'[417]

> 'The old time Māori was sophisticated caretaker of the environment, and had knowledge of the intimate movements of the natural world. Everyone was taught these. The system worked very well because the (Ōtaki) river was part of our heritage… The stopbanks reduce the movement of the river. The problem is the engineers, they are out of touch with nature. Care needs to be taken with all the streams, creeks, rivers, wetlands and lakes in our area.'[418]

It is difficult to define the impact that destroying those ancient locations which washed their ancestors' bones into the ocean had on the whānau and hapū involved.

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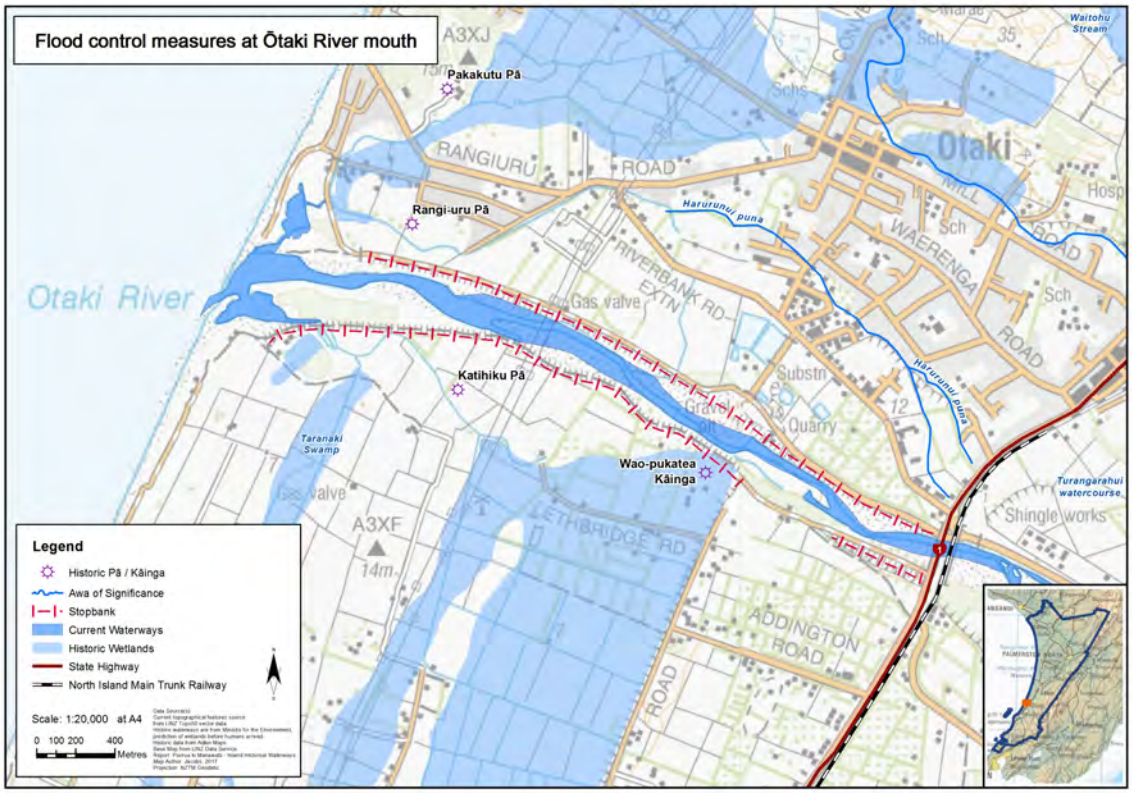
[416] Abbreviation used for the iwi confederation that includes Te Āti Awa, Ngāti Raukawa ki te Tonga and Ngāti Toa Rangātira.

[417] Te Waari Carkeek, Ngāti Raukawa ki te tonga, interview at the office of Te Rūnanga-o-Raukawa, Haruātai, 28 September 1992, in A Rāwiri, *Restoring mātauranga to restore ecosystems*, Ōtaki, 2012, pp 5-6.

[418] Rāwhiti Higgot, Ngāti Toa Rangātira and George Gray, Ngāti Raukawa ki te tonga, interview at the Ōtaki River mouth, 28 July 1992, in ibid, p 6.



Map 33: **Stop banks on the Ōtaki River mouth area.**[419]

Kaitiaki of the Ngāti Whakatere environmental group, Te Taiao o Ngāti Whakatere, have also shared their discomfort at the Manawatū River stopbanks near Shannon having a similar obliterating effect on one of their ancient urupā.[420] They described how the river had been diverted by councils, and how these changes had meant the urupā was now in the river. Their goal is to have the river re-diverted off their tūpuna. Te Kenehi Teira provided the location of an urupā affected by the Foxton Loop scheme: 'The main urupā destroyed was between Te Rerenga o Hau kāinga and Whakaripa kāinga, about 20 acres – 95 per cent of it has gone.'[421] Maps 34 and 35 below show the known urupā sites on the Manawatū River that have been affected by council stop banks in their efforts to protect farm lands.

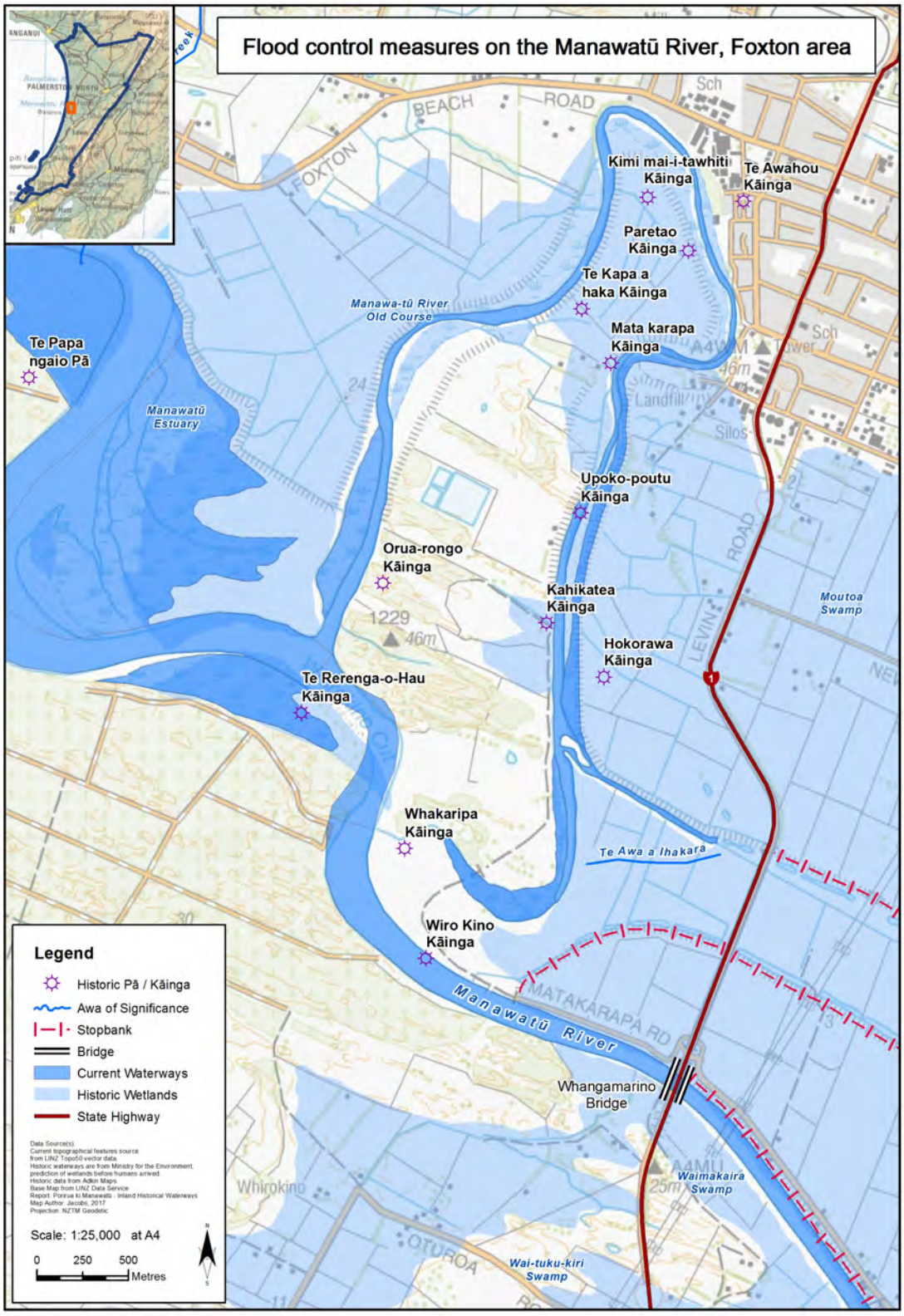
419 Created by Jacobs, courtesy of Crown Forestry Rental Trust.

420 Te Taiao o Ngāti Whakatere, in M Poutama, A Spinks, and L Raumati, *Porirua ki Manawatū Inquiry: Collation of Oral Narratives for Inland Waterways – Cultural Perspectives Draft Report* (Wellington: Crown Forestry Rental Trust, 2016), pp 175-176.

421 Personal communication, Te Kenehi Teira, 3 April 2017.

Map 34: **Stop banks on the Manawatū River, Shannon area.**[422]

[422] Created by Jacobs, courtesy of Crown Forestry Rental Trust.



Map 35: **Stop banks on the Manawatū River, Foxton area.**[423]

423 Ibid.

Appeals to Crown agencies were made within the inquiry district to cease Public Works for flood protection that affected urupā sites. A letter of complaint was written in te reo Māori by whānau of Shannon (including the Rauhihi whānau) to the Minita Māori (Native Minister) on 21 March 1930 which outlined their objection to the proposed cut by the Manawatū-Oroua River Board affecting Tapunga Block No. 69.[424] The objections included:

1. *That the cut goes right through our homes.*
2. *That the balance of acres left to the new sellers is not enough to represent their shares.*
3. *That our Cemetery on Whakawehi 113 Reserve (at the bottem end of the cut) is likely to be eroded although the Board guarantees that it will put in protection works to effectively stop that.*

Well, Sir, we doubt its ability to do so with all its guarantee. Imagine our feelings if the Board fails to stop the erosion.

The Minister of Public Works replied on 24 March 1930 to Takerei Wi Kohika of Moutoa, Shannon, that he received his letter and objection as a Native land owner and informed that he would 'carefully consider' the request'.[425] A further letter by Takerei Wi Kohika on 9 April 1903 to the Minster of Public Works was necessary, however, as the tender for the cut works closed on 31 March and the successful contractor had started the job that same day. Kohika stated that they had not been approached by the River Board or notified by the Māori Land Board in relation to the matter and his whānau was occupying a house right in line with the proposed cut.[426] He noted that 'being native land we were under the impression that any proceedings affecting the land would have to be dealt with by the Māori Land Board or Native Land Court.' As owners of another block in Manawatū- Kūkūtauākī 7E proposed to be cut through another River Board scheme he stated that the Board was:

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[424] Takerei Wi Kohika, Moutoa, Letter to the Minister of Māori Affairs, 21 March 1930. Subject: Tapunga No. 69 – complaint that Manawatū-Oroua River Board intends to cut a channel through the land and threaten the Cemetery on Wakawehi 113 with erosion, 1930. Archives New Zealand, Reference R22411673.

[425] EA Ransom, Minister of Public Works Letter, 24 March 1930. Archives New Zealand, Reference R22411673.

[426] Letter to the Minister of Public Works Letter, 9 April 1930. Archives New Zealand, Reference R22411673.

> *"welcome to it as far as we are concerned, rather than lose Taupunga Block a much more valuable land. It appears therefore, that our only two blocks of freehold land by the Manawatū River are right in the line of fire.*
>
> *The scheme is going to make quite a lot of the owners practically landless."*[427]

Takerei Wi Kohika also wrote to the Native Minister on 14 April 1930 to inform him of their appeals, concerns, and correspondence and he also stated that 'this place is one of our ancient homes. We were born and grew up here.'[428] After making enquiries, the Native Minister, replied in English and te reo Māori on 8 May 1930, stating that:

> 'Apparently the River Board has full power to do what it proposes to do after giving a month's notice to the owner, but the omission to give notice does not make the act illegal. Apparently the Board does not acquire the freehold but simply a right in the nature of an easement. The Act does not in terms provide for payment of compensation but it has been assumed that compensation will be payable. The only way the Natives could stop the matter would be by proceeding for injunction in the Supreme Court.'[429]

This reply fell well short of the plead by the Māori owners. It was also likely to be one of the actions that resulted in the loss of a sacred urupā in the region.

The protection of wāhi tapu has also been an issue of considerable importance to Te Ātiawa ki Whakarongotai. In response to the Wellington Regional Council's flood protection plans in 1993, Rawhiti Higgott presented a report which described and mapped the wāhi tapu within the Waikanae River floodplain and surrounding areas so that they could be safeguarded from future flooding (see Map 36 below). Higgott stated that while some wāhi tapu were respected, particularly urupā, others were not and especially if there was a clash with commercial interests. In his report he also stated that councils often had difficulties in recognising non-urupā wāhi tapu as sites of spiritual significance.[430]

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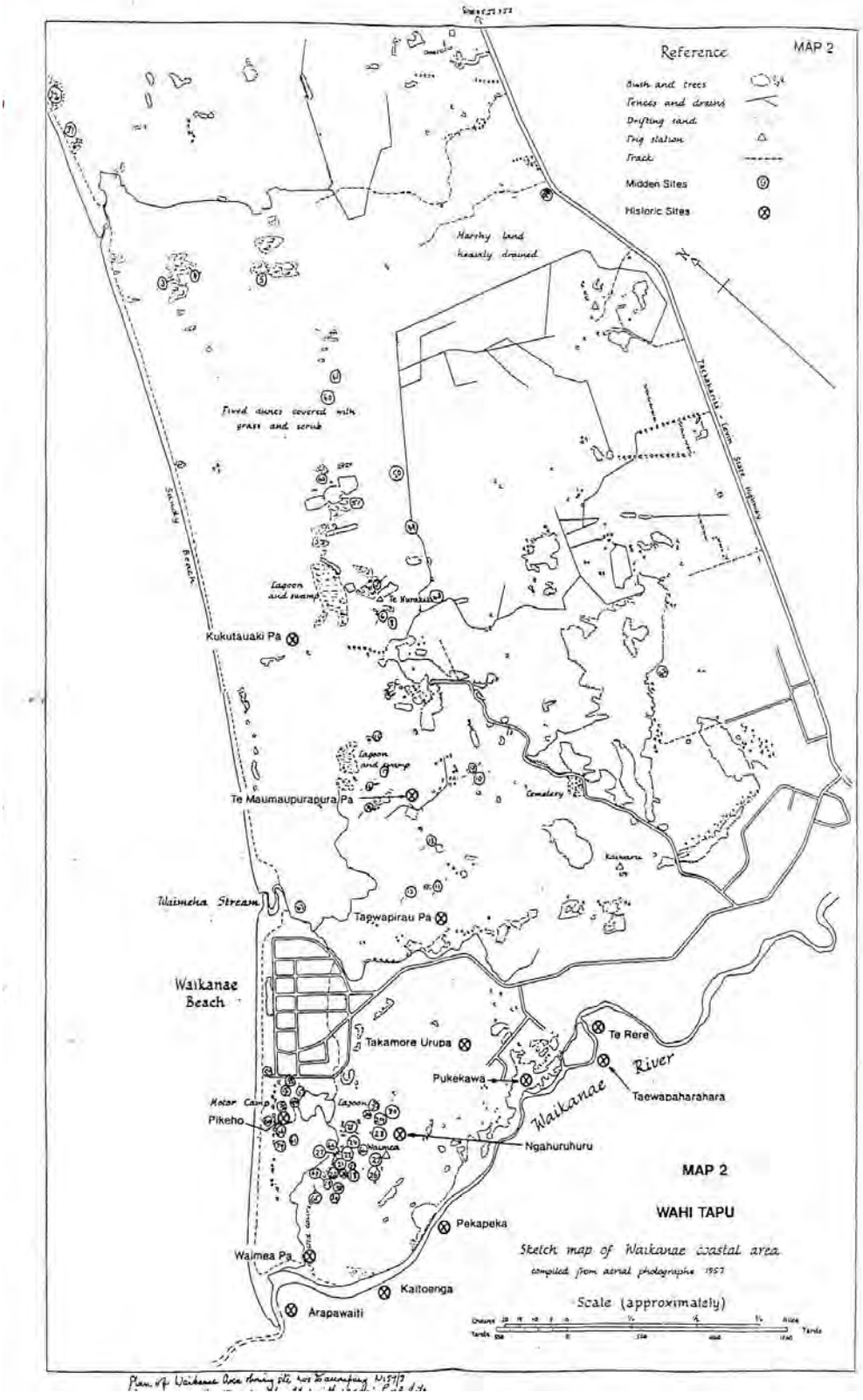
427 Ibid.

428 Takerei Wi Kohika, Moutoa, letter to the Native Minister, 14 April 1930. Archives New Zealand, Reference R22411673.

429 Minita Māori (Native Minister), letter to Takerei Wi Kohika, 8 May 1930. Archives New Zealand, Reference R22411673.

430 R Higgott, *Ati Awa ki Whakarongotai Response to Wellington Regional Council Contract Entitled: Waikanae River Floodplain Management Plan, Phase 1, Tikanga Māori, Waikanae* (Wellington Regional Council, Wellington, 1993).



Map 36: **Wāhi tapu in the Waikanae region.**[431]

[431] Ibid, p 14.

Stop bank protection measures by local councils have often included extensive planting of non-indigenous willow trees as opposed to natives – including along the Ōhau River.[432] Councils' preference for willows has been due to the low cost of willow saplings and their high survival rate – although there are ongoing maintenance costs to do with trimming, layering, removal, and replanting. According to councils, willows provide bank protection by acting as a buffer zone; reducing flow velocities along river banks with the tree roots strengthening the banks and inhibiting erosion.[433] In the main, hapū and iwi have objected to the use of willows over native trees. For them, native trees are much preferred as they provide the ideal and sometimes necessary habitat and resources for other interdependent native flora and fauna.

3.3.5 Floodway and Sluice Gate Schemes

Another flood control mechanism used by councils in the inquiry district has been the construction of floodway and sluice gate schemes. On 22 September 1962, a major floodway and sluice gate scheme to "keep the Manawatū district flood free" was officially opened at Moutoa along the Manawatū River.[434] The history and impacts of this on local hapū and iwi is detailed further in this chapter – see case study six on the Manawatū River.

3.3.6 River Straightening Mechanisms

Further mechanisms used by councils for flood control have included the straightening of rivers and streams, such as by constructing straight drains or introducing 'cuts', to reduce the meandering of major rivers around natural bends and enable water to discharge to the sea as soon as possible. Straightening mechanisms have had a significant impact on stocks of aquatic flora and fauna due to loss of habitat. This has included the loss of grasses along shallow river bank areas which are spawning areas for whitebait, and the destruction of deep pools with steep banks which are ideal habitats for large tuna. Straightening mechanisms have also impacted on the hydrology or the movement of water into the ocean. Fisheries species and habitat are directly affected in the river mouths and estuaries by increased flow rates. This is discussed further below, in the case

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[432] G Williams, Ō hau River Burnell & Catley Bends: Flood Mitigation and Channel Management for Horizons Regional Council, Ōtaki, 2006, p. 5.

[433] Ibid.

[434] Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period 1945-1962; Feilding Central Archives, File HRC 00005:1, p. 17.

study on the Ōhau Loop. The Foxton Loop scheme is also discussed further in this chapter – see case study six on the Manawatū River

3.3.7 Case Study Seven: Ōhau River Scheme[435]

Flooding has been a reoccurring issue along the lower reaches of the Ōhau River. To alleviate flooding, the Manawatū Catchment Board developed a major water-engineered endeavour: the Ōhau River Scheme project. The scheme developed as a series of failed attempts. Cabinet first approved it in March 1953, where a proposed subsidy offered two dollars for every dollar of local money. It did not eventuate because the low subsidy rate meant more local financial input from contributors. When presented at the initial meeting, local farmers in the area rejected it.[436]

Between 1965 and 1972, alteration plans were again mooted for the site and the subsequent constructions included motorscaping and re-shaping former papakāinga sites or raised Māori occupation areas as hillocks above waterways, and transforming them into stopbanks along the true left bank of the Ōhau River and Kuku Stream. These developments seeded apprehensions in local hapū and iwi regarding the spiritual and cultural places around the lower reaches of the Ōhau River. Some Māori landholders, the Ngāti Tūkorehe Tribal Committee, the Tahamata Incorporation (when finalised), some local non-Māori farmers as landowners, and other non-Māori lessees of Māori land at the coast, supported the scheme.[437]

A large cut was also created on the lower river meander to divert water away from a tortuous loop that encouraged natural flooding in that region. Leading ecologist and author, Geoff Park, would state in a Waitangi Tribunal Report that:

> ‘Māori certainly did not confine their interest in swamps to their customary hunting-gathering relationship. They frequently used the Crown’s laws, policies and subsidies to drain their swamps and create fertile pasture. Moreover, it was long-standing policy of the Department of Māori Affairs to develop the ‘wet areas’ on Māori land for farmland. In the 1960s and 1970s, for example, the Ngāti Tūkorehe owners of Tahamata Incorporation in the Horowhenua,

[435] This case study was written by Associate Professor Huhana Smith.
[436] S Smith, 2007.
[437] Ibid.

comprehensively drained and altered the swamps and waterways in the lower reaches of the Ōhau River in association with the local catchment authorities.'[438]

While there is some truth behind Park's submission, the establishment of Tahamata Incorporation marked a significant transition in local peoples' attitude, thinking and tribal practices, particularly their movement from customary fishing activities, access to the river for floundering, fishing or white baiting within farm leases and shell fish gathering at the river beach or foreshore. The reality behind Park's submission is more complex and intricate than he reported. For decades, long before the development and formation of Tahamata Incorporation there had been a range of land uses at the coast. They varied from non-Māori lessees utilising blocks of Māori land, particularly around and including Te Hākari wetland, who carved extensive and deep drains right through wetland to create more arable land around its edges for grazing regimes. As Tahamata was not officially formed until 1974, the coastal flood plain and wetland area had previously been under a number of separate titles with individual or collective Māori owners.

There was a range of intricate and complex land tenure arrangements in the Kuku coastal area. In the late 1960s, some landholders apportioned and titled their shares through the Māori Land Court, which in the early 1970s were also incorporated to augment the necessary acreage required to develop the Tahamata farming operation. This also included subsuming the Ōhau pā reservation and its adjacent urupā or burial ground, in order to supplement the acreage required to gain greater support funding that would launch the farming enterprise. Other Māori-owned areas at the coast were amalgamated into one certificate of title administered by the Ngāti Tūkorehe Tribal Committee.[439] There were some long standing, concurrent non-Māori leases of Māori land whereby the lessees would go about seeking renewal from particular kaumātua to continue their farming of the coastal region. Over time, there were some land sales to non-Māori farmers. There was also some pressure from others to sell Māori land blocks using forms of financial indebtedness built up over time that was referred to as 'tamana' payments. The Hon. Douglas Kidd explains "tamana" payments:

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[438] G Park, 'Swamp ecosystems, swamp drainage, and the development of wetland conservation' (Chapter 2) in Effective Exclusion? An exploratory overview of Crown actions and Māori responses concerning the indigenous flora and fauna, 1912-1983, Waitangi Tribunal Report, Wellington, 2001, p 85.

[439] Letter to the Secretary of Manawatū Catchment Board, Palmerston North from Edward O'Conner, engineer of the project dated 20th June 1972 concerning Ōhau River Scheme Report on Ngāti Tūkorehe Tribal Property, Archives Central.

> ‘There used to be a system, frowned on latterly of course, and my Treaty work brought me in contact with my first tamana payments – it was a process whereby people who had eyes on Māori land would lend the owners money. They’d come back and they’d get more and they would keep a careful record of it as sort of advance payments on a lease. People would get on the land by some formal leasing arrangement, not approved by the then Native Land Court. People received the money and this tended to generate spending aspirations and a dependency on more money, and then the crunch, the squeeze would come and the land would be transferred. I recall my father, in one of his few non-Christian moments (it may have been just a teeny bit of envy), which is also not Christian, that this what [a certain farmer] had been up to for years. The land down here is much partitioned – even back then it was and, I think it was more so later – Māori gradually handed over land to [the named farmer].’[440]

There was also the complex, subsuming of shares so legitimate descendants were removed from land blocks, and then a more comprehensive Māori share consolidation process whereby individual Māori shareholder(s) bought up others’ so-called “uneconomic” Māori shares.[441]

The Ōhau River Scheme was reconsidered in August 1965, when a new classification for land rating was put forward, which refers to land receiving benefit from the scheme. Local farmers again voted against this. A petition was organised in late 1966 and a meeting was held in June 1967. The ratepayers voted in favour of the Manawatū Catchment Board preparing a new scheme. Engineer, Mr Peter Farley, redesigned and presented it for approval in September 1968. However, local farmers again disapproved the scheme when another farmer across the river had a long argument with the Board’s Deputy Chief Engineer, Mr Fancourt. This set the tone for local farmers to disapprove the next proposal. Catchment Board engineers could be quite belligerent about their schemes, which usually created difficulties with resident farmers. In 1971, Mr Edward O’Conner became the engineer for the Ōhau River Scheme. He had considerable experience from

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[440] Personal communication, Hon. Douglas Lorimer Kidd, 6 January 2006.

[441] Under the Māori Affairs Act 1953, shares worth less than £25 were compulsorily vested in the Māori Trustee. This was done in an attempt to deal with the issue of title fragmentation by reducing the number of owners on titles. However, it meant that some owners lost their interests in land if their share was considered too small.

his time with the Waikato Valley Authority, and came recommended from various farmers to reconsider the Manawatū Catchment Board's next attempt.

In creating Tahamata Incorporation with financial support, which was finally gained after some effort from Māori Affairs, Wellington, Tūkorehe marae would become a large shareholder in the tribal farm and a significant recipient of benefits generated by the tribe's new and subsequently lucrative economic activity. By sanctioning the Scheme in 1972 and establishing the farm in 1974, this Māori-instigated development for better economic futures impacted on other non-Māori farmers maintaining their farming foothold in fertile coastal lands. Despite what is assumed in the Waitangi Tribunal Report about local Māori allowing farm drainage or diversion work to proceed to establish Tahamata as a major Māori economic entity, the waterway engineering activities went ahead particularly for the interests of other non-Māori farmers at site and up stream. What is important is that not all Māori shareholders or non-Māori farmers on the other side of the river agreed to the river diversion going ahead. For Māori there were concerns for adverse effects in close proximity to sacred grounds and formerly resource rich waterways.

When O'Conner arrived to design the plans for the Ōhau River loop job, he was shocked that many of the calculations and assumptions made within the proposal had involved minimal field investigations. The tidal effects had been so minimalised that a gauge was installed to check tidal movement in the lower reaches. The tides were quite substantial as the river had a very flat gradient in its lower reaches. Shareholders were certainly alarmed at how flooding events impacted so dramatically on the area, just after the mechanical alignment and schemes works began in the winter of 1972. The river diversion impacts would eventually subside. The tribal directors developed the dairying practice and training, with concerted community effort and management strategies employed to improve farming methods, so much so that Tahamata Corporation became an assured economic success for the tribe.[442]

By 1996, however the remnant river, lagoon or 'loop' was trapped within the grazing land, peppered with intermittent stands of tī kōuka, toetoe, wiwi or common rushes, and macrocarpa shelterbelts along some fence lines. The water in the 'loop' had become so

[442] S Smith, 2007, p. 94.

eutrophic or oxygen-depleted that it was said to have caused stock sickness and loss, and was unable to fully support life within it. With a curtailed natural flow in the 'loop' and restricted tidal flushes, the sludge on the riverbed was a concentrated cocktail of dairying effluent, pesticide and herbicide runoff from decades of intensive agricultural activity from earlier cow bale sites, and from farming, horticultural or gravel mining activities further up river.[443] The combined practices contributed to the Ōhau River remnant's severe decline, ironically restricted by the same economic successes of the farming enterprise for tribal shareholders.[444]

The modifications also disconnected the backwater known locally as the 'blind creek', a region renowned for special resources, taniwha or significant spiritual entities. Together the combined engineered 'cut', the stopbanks and constructed culvert prevented tidal river waters flowing back into the 'blind creek' area. In this once revered area, the major earth works subsequently caused the disappearance of the peraro or fresh water oyster and kōura or freshwater crayfish. Fresh water shellfish filter water when feeding, so when the blind creek was disconnected the shellfish could no longer feed on algae present and keep waters clear. There were correlated impacts on the quantities of foreshore tuatua and toheroa, of kokata/kōkota as river pipi, kākahi or fresh water mussels, aua or yellow-eyed mullet, kanae or grey mullet, pātiki known as the black flounder, lamprey or silver fish, banded kōkopu, giant kōkopu, īnanga in both adult and juvenile or whitebait forms, and tuna.

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[443] The initial Lucas Associates report 'Kuku-Ōhau Situation & Opportunities in the Lower River: Preliminary Notes' begun in August 1997 and printed in 1998 outlined the problems for the lower reaches of the Ōhau River. While the regional council put in an improved culvert in 1999, the council's main concern for the region was flooding, so the replacement culvert did not allow for the required flushes of tidal waters into the 'loop' system. The bottom of the river remains lined with toxic sludge, which will be difficult to remove so it can be disposed of safely. Intensive planting of dune stream land vegetation will eventually clear waterways but this will take a very long time. The water conditions were still very marginal but the riparian areas were finally fenced off from cows in 2005. The issues are more immediate and require urgent attention, where significant project planning is required for extensive riparian planting. On 31 July 2006 with personnel and financial support by Tahamata Incorporation, the tasks for this area were activated, with a major planting of grasses, shrubs and trees. Since this time more considerable effort has been applied to this area. See www.mtm.ac.nz for updated Ōhau River 'loop' reports for Phase 1 and 2 activities.

[444] Investigations in 2006 would reveal that the current quality of water in the loop is made up of inorganic nitrogen, dissolved reactive phosphates, suspended solids, dissolved solids and in one particular site near the old dairy bale, ammonium levels that supersede safe health levels. Derived from notes taken at Group 7B EWB Consultancy Ltd presentation, 'River restoration and dairy farm management at Ōhau Loop', Integrative Studies 2006, Massey University, Palmerston North, 18 October 2006.

3.3.8 Changes to the Mouths of Rivers and Streams

Changes to the mouths of rivers and streams has been yet another flood control measure undertaken by councils in the inquiry district, which has involved works to fix the mouths in one place. Such works have been undertaken on the Waimarama Stream, Ōtaki River, Waimeha Stream, and the Waikanae River. While ostensibly for flood control, some have also enabled the reclaiming of land for development purposes.[445] For example, after a major flood event in 1957, the Manawatū Catchment Board took just over 72 acres under the guise of river control. The blocks affected included parts of Ngarara West A sections 2, 3, 19, 20, 21, 22, 23, 29, 35A & 78.[446]

The removal of driftwood from river and stream mouths is also used by councils to control flooding. As Wayne Kiriona discussed in his interview for the inland waterways cultural perspectives projects, these areas are locations where tuna sit, hide, and wait for the right tide or natural signs to inform them of when to run.[447] The driftwood also provides an ideal resting place before heading out to sea and beginning the very long migration journey to Tonga. It has been one of a plethora of actions that have impacted on tuna stocks.[448]

3.3.9 Case Study Eight: Waikanae River and the Waimeha Stream

Local authorities made drastic changes to the inland waterways in the coastal beach area of Waikanae which was then developed for housing. As shown in Map 29 in Chapter 2.5.1, the Waikanae River had an additional channel, the Waimeha Stream, which took in excess waters during flood events. The stream is now a separate water body. In making these changes, local authorities and the Waikanae Land Company reclaimed land around the Waikanae River mouth along the beach development area. Indeed, over 350,000 cubic yards of sand was dredged from the Waimeha lagoon for this purpose. Consequently the flooding risks that followed has led to ongoing cuts to ensure the Waimeha Stream and

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445 See for instance, Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period 1945-1962; Feilding Central Archives, File HRC 00005:1, p 17.

446 Survey District and Block IX, Kaitawa S.D. Land district Wellington. Local bodies Horowhenua County and Hutt County, Surveyed by G.W. Hartnell. Date, January-February 1958. Cited in Ibid, p 176.

447 W Kiriona, in Poutama, Spinks, and Raumati, 2016, pp 16-17. Also, personal communication, Rawiri Kiriona, 6 February 2016.

448 W Kiriona, in Poutama, Spinks, and Raumati, 2016, pp 16-17.

Waikanae River mouths do not erode the sand dunes and river banks and impact on the surrounding urban area.[449]

Map 37: **Cutting a new channel in the Waimeha Stream.**[450]

These changes to the mouths of rivers and streams have had a destructive effect on estuarine environments. Estuaries are an important habitats for small fish species and estuarine fish and bird species, and are an important part of the wider food chain – and their destruction creates a severing of that chain.

In the 1970s, a number of local residents, conservationists, and scientists who had studied the Waikanae estuary, backed by the Wildlife Service and Nature Conservation Council, argued that fixing the river mouth in one place would severely affect the natural habitat. They were also concerned that the cost of maintenance would be taken up by Waikanae ratepayers. While the cost also concerned the Manawatū Catchment Board, they approved the scheme including a provision designed to protect the Board's liability. To

449 Maclean and Maclean, pp 175, 184-196.
450 Ibid, p. 223.

compensate, the Ministry of Works declared that the Crown intended to create a wildlife and recreation reserve on the south side of the Waikanae River mouth.[451]

3.3.10 Case Study Nine: Manawatū River

The Manawatū River has been subjected to all of the flood control interventions discussed above – which have been undertaken by various river and drainage boards, and local and regional authorities, since the late 1800s. It is no coincidence that it is now one of the most polluted inland waterways in the inquiry district.[452]

The Manawatū River has a major catchment area that drains both sides of the Tararua and Ruahine ranges with numerous tributaries. The Manawatū River passes through the mountain ranges in a 'water gap' known as Te Apiti or the Manawatū Gorge. This geological feature indicates that the river itself is older than the landscape.[453] The two largest tributaries flowing into the Manawatū River are the Oroua and Pohangina which are large rivers in themselves. Adkin cited a recording by Edward Wakefield that:

> 'the natives have a legend that [the course of the Manawatū River] was formed by an Atua, or 'Evil Spirit', who was in the form of a large totara tree, and wormed himself along like an eel on his way from the east coast to Cook Straight. His name was Okatia...'[454]

This supernatural entity is also described from a Ngāti Raukawa perspective:

> 'Okatia came from the Puketoi ranges, east of Pahiatua… imbued with enormous mana, ihi and wehi. He formed the Manawatū River and split up Tararua (a young man) and Ruahine (an old lady). Ruahine was an ancestress of Rangitāne. There is a rock named Te Ahu a Turanga by the road in the Manawatū Gorge. Turanga is the father of Ruahine and the son of Turi (captain of the Aotea waka). Te Apiti, the gorge, is a tapu place because it is the place where Ruahine was separated from her young lover Tararua. Te Ahu a Turanga overlooks a place in the river where a taniwha called Whangaimokopuna, sits beneath a rock, keeping it always out of the water, no matter how high the flow of the river. Whangaimokopuna

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451 Ibid, p. 195.
452 JD Stark, Aquatic Invertebrate Communities of the Manawatū-Wanganui Region Trends in River Health. Stark Environmental Ltd for Horizons, 2016.
453 Knight, 2014 p. 22.
454 E Wakefield, *Adventure in New Zealand*, Christchurch, 1908, in GL Adkin, 1948, p 212.

> comes down-river as far as Poutu, Shannon. Te Ahu a Turanga is the mauri for the wāhi tapu, the gorge. Okatia's mission was not only to carve the winding pathway of the river, but also to ensure the safe passage of all the species which migrate from Tonga and other parts of the Pacific, from the ocean inland to the wetlands where they can breed. The beach south of the Manawatū River mouth is named Okatia.'[455]

Historian Catherine Knight who was brought up in the Manawatū region writes about the environmental changes that have affected the Manawatū River in her recent publications.[456] Of particular interest is her book *Ravaged Beauty* which focusses on the environmental history of the Manawatū River, one of the largest rivers in the Porirua ki Manawatū inquiry district. Her interest in the river stemmed from the rapidity and completeness of its transformation in two generations from a 'heart-stoppingly', 'beautiful river' to a forestless, 'mundane' landscape today.[457] The chapter entitled 'controlling the uncontrollable' is dedicated to the flood control mechanisms installed along the river and, as such, it features throughout this case study.

The Manawatū River in the upper catchment area had a higher gradient so the waters ran fast, then as the gradient declined the waters slowed and gravel and silt were deposited as the waters meandered at will across the changing flood plains. Numerous historic pā and temporary kāinga were located along the stretches of the Manawatū River, in particular in the eastern portion. Adkin listed 83 Māori settlement sites on the banks of the Oroua and Manawatū rivers.[458] The rivers were travelled by waka and although numerous waka landing locations were present along the Manawatū River, two were significant: Te Wakapuni and Tauwaka.[459] The meandering nature of the Manawatū River, shown in Figure 20 below, created lagoons indicating it was subject to natural environmental changes.

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455 H Collins, Whirokino Trestle and Manawatū Bridge Development Cultural Impact Assessment Report produced for New Zealand Transport Authority, Unpublished report, Taiao Raukawa Environmental Trust, 2015.

456 C Knight, 2014; and C Knight, 2016, pp 19, 25, 33-38, 52-57, 61, 71-73, 82, 159, 180-185, 191, 225, 236-237.

457 C Knight, 2014, p 15.

458 Adkin, 1948, pp 210-214.

459 Ibid, pp 37-38.

Figure 20: **Manawatū River showing the Opiki bends and the Oroua River with its confluence.**[460]

Over the centuries the forest and flooding events had created a very attractive fertile soil in the lower catchment area which was highly desirable to early agriculturalists and later horticulturalists. Before the onset of large scale agriculture and drainage that accompanied these industries, large lowland swamps laid alongside the Manawatū and Oroua Rivers. Historically these basins took a lot of the impact of floodwaters.[461] Without the natural forest canopy to soak up rainfall and hold on to substrate, high precipitation events only hastened surface waters on its descent down the ranges and increased substrate transportation from the gorges to travel down through to the upper catchment areas. Upon reaching the lower gradient catchment areas, the flow slowed resulting in substrate build up on the river beds.[462] In high rainfall this led to major flash flood events and, as the waters spilt over the river banks, it quickly filled the lower basin areas. The aggradation caused by erosion in the Manawatū River catchment area and its tributaries raised the height of the beds and thus the natural drainage outlets for

460 Aerial photograph by N. Andrew Steffert.
461 Knight, 2014, p 161-162.
462 Adkin, 1948, p 5.

floodwaters were impaired.[463] Flood water heights over expansive areas took a long time to subside.

As a consequence of deforestation and drainage, the Manawatū River has become increasingly flood prone. The largest flood recorded was in 1904, but major floods also occurred in 1902, 1924, 1925, 1942, and in 1953. Then followed a period of successful flood protection measures until the recent devastating flood event in 2004. The 1902, 1904 and 2004 storms were estimated as having had the fastest flood rates (the 1902 maximum discharge rate was 160,000 cubic feet per second),[464] and highest river heights.

Early Māori and Pākehā settlers alike discovered that with high rainfalls, flooding was to be expected in this region. By the 1950s, however, Pākehā settlers were beginning to note how deforestation had exacerbated flooding. This is evident in the following quotes, the first by Miss Warburton in 1952, the daughter of an early setter; and then Mr Waugh in 1986 who had been farming in the Kimbolton area for over 60 years:

> 'As the bush on the hills and along the banks of the rivers and streams in the Manawatū and Hawkes Bay Districts was felled and burned, the low lying country began to feel the effects of any spells of rain, particularly if prolonged, and the land thereby suffered from flooding.'[465]

> 'While the canopy of native bush was undisturbed little flooding occurred, but when the bush was felled, and subsequent fires followed, and the autumn rains came in quantity, the run off was much faster. [In one such flood] the Oroua River swept many acres of rich flats, newly felled and cleared.'[466]

As controversial large native land block sales increased in the Manawatū region, settlers were encouraged to take up residency. The importance of flood control was quickly realised by the settlers but was limited by the small population, an infant economy, and low levels of funding. The Rivers Board Act 1884 and Land Drainage Act 1893 both

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463 Jennifer McNeill-Adams, *Effects of the Lower Manawatū River flood control scheme on the farming of the Lower* Manawatū, Unpublished Master's thesis, Massey University, Palmerston North, pp 9, 31, in Knight, 2014 , p 162.

464 Archives Central File, HRC_00024: Box 4: 1/5/A, p 2.

465 Charlotte Warburton, *Changing days and changing ways*, Palmerston North,1954, p 51, in Knight, 2014, p 143.

466 D. Thomas Waugh, *North to Kimbolton*, Feilding, 1986, pp 26-27, in Knight, 2014, p 144.

legislated the formation of local authorities to address and manage flood control measures and protect the productive farm lands of these settlers.

The Mangaone River Board, formed in 1887, was the first of its nature to be established in the region. Its primary objective was to drain excess waters from constituent landowners' farms, into the Mangaone River. In 1894, the Manawatū Land Drainage Board was established covering a triangular area between the Manawatū River and the Oroua River. In the same year, the Horseshoe Drainage Board and Sluggish River Drainage Board were also formed to address the drainage of the swamps – including in the Oroua Downs area.[467] The formation of other river and drainage boards soon followed to address the numerous surrounding tributaries and swamps in the area. Between 1906 and 1913, four further drainage boards were established in the Manawatū region, namely, the Moutoa, Makerua, Oroua, and Buckley drainage boards. Their aim was to convert swamps in the region to potential farm land.

Arterial drainage methods were used as the boards and individual farmers were encouraged to drain their properties using open ditches.[468] Mole drainage was introduced to the Manawatū region in 1900 by Mr W.J. Harris and Captain R.N. Hewitt. Using teams of bullocks or horses they dragged a mole plough along the main road from Palmerston North to Shannon. Drainage works were furthered by two field husbandry staff members from Massey College (now known as Massey University) – A.W. Hudson (later Professor) and A.G. Hopewell. They obtained a tile trenching machine from Great Britain and studied the use of the machinery and also provided demonstrations to the local farming community. In hot demand, they established the Massey College Draining Extension Service and conducted field investigations of wet areas and, in some cases, redesigned the layout of entire farms based on the optimal drainage layout.[469] Drainage thus became an effective measure in the district that coped with surface water extraction – but the schemes were not a successful mechanism against major flood events.

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467 Ibid, p. 163.

468 K.L. Mayo Field Drainage Chapter in B.G.R. Saunders and A.G. Anderson (Eds), *The Geography of New Zealand, Study 1, Introducing Manawatū*, Palmerston North, 1964.

469 Hudson and Hopewell, 1941, in ibid.

A Report of Proceedings of the Manawatū Land Drainage Commission in 1908[470] was addressed to His Excellency the Right Hon. William Lee, Baron Plunket, Knight, Governor and Commander-in-Chief in and over His Majesty's Dominion of New Zealand. The stated purpose of the report was to: investigate the desirability of various land drainage district reconfigurations, and to formulate a comprehensive scheme of drainage of lands in the basin of the Manawatū, Oroua, and Pohangina Rivers within the Counties of Kiwitea, Pohangina, Horowhenua, Kairanga, and Oroua, and the Boroughs of Palmerston North, Foxton, and Feilding; formulate a scheme by which the rivers may be made more effective as a means of draining the various localities referred to, and less injurious to the lands through which they flow; and for such a scheme to include the constitution and powers of the governing bodies and the area of the country to be rated for the purposes of the works.

The report recommended that the four respective drainage boards should continue as constituted with various alterations as specified. The majority of the report then went on to address the drainage schemes themselves, for an area of approximately 70,000 acres that were subject to heavy flooding.[471] Various possible drainage schemes were proposed and evaluated, including costings, and recommendations given as to the viability of each proposal. The question of who should carry the costs of such drainage schemes was also raised:

> 'It is true that the principal part of the flood-waters comes from the upper watershed, including Pohangina, Kiwitea, and Oroua Counties, but it seems to us that it only comes in a natural way. The settlers in those districts by felling the bush &c., are only doing what, in the ordinary course of the enjoyment of the land, they are entitled to do, and the waters get into the river by gravitation only. It would therefore, we think, be unfair to hold them liable for any damage such waters may do, or to ask them to contribute towards the relief of the lower flooded land. The rivers are the natural drains of the country, and as such every settler is entitled to drain into them. The upper counties therefore – viz., Pohangina,

[470] The Report of Proceedings of the Manawatū Land Drainage Commission in 1908. Archives New Zealand. Reference ACGT 18572 LS72/2.
[471] Ibid.

> Kiwitea, and Oroua – should be excluded from the area which should be called on to provide the money for this scheme'.[472]

The rights of settlers was clearly paramount in Crown decision making regarding drainage of land and flood protection mechanisms, and it was considered their 'right' to drain their land, for their enjoyment of that land.

The report also noted that 'the Government and the country as a whole' benefited from the drainage of land that was carried out through the work of the Drainage Boards, which warranted government financial assistance in many of these drainage schemes.[473] This report is a prime example of the fact that the Crown played a key role in the establishment, reconstitution and planning of drainage catchment boards in the inquiry district.

In 1922, the Manawatū-Oroua River Board was established with the primary objective to manage flood protection in the lower catchment area of the Manawatū River downstream of Palmerston North. Shortly after, in 1923, the board proposed an ambitious plan to straighten the Manawatū River. The Crown established the Manawatū-Oroua River Commission to determine the costs, benefits, viability, and who should pay for the expensive scheme. The Commission pointed out the local benefits including an increased agricultural production of £200,000/year, and suggested that the Crown fund over one third of the cost. This was not supported by the Crown and the project failed.[474]

In addition to the establishment of the Manawatū-Oroua River Board in 1922, the Crown also introduced and passed the Manawatū Oroua River District Act in 1923, and established the Manawatū-Oroua River Commission in 1926. The proximity of these dates to one another indicates that the early-mid 1920s were a time of considerable Crown intervention in flood control in the inquiry district.[475]

In the 1940s, however, part of the proposed design for flood protection in the lower Manawatū River catchment area was incorporated into the Moutoa Floodway project

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472 Ibid. p 5.
473 Ibid. p 5.
474 Knight, 2014, pp 164-165.
475 Personal communication, David Alexander, appraisal received during the Draft Report feedback stage. Received via email from Nicola Kiri-Smith, Crown Forestry Rental Trust 5 July 2017.

which is still in operation today.[476] This project is discussed further in the following pages. Flood control was seen as essential in order to protect productive and therefore valuable farm land.

> 'The land where the flax has been destroyed is now used for dairying, fattening bullocks, grazing sheep, growing crops to feed stock, and also growing onions, potatoes, carrots and other crops. This land and the balance of the land in the [Manawatū River] Board's district is among the most productive in New Zealand – perhaps in the world. And for this reason it is well worth protecting against floods."[477]

The Manawatū River was estimated to drain an area of 2,296 square miles.[478] Stopbanking was also adopted along the Manawatū River and its tributaries. In the initial stages, these were also ineffective in controlling flooding in the region. The length of the major rivers, coupled with the numerous river and drainage boards that had been established and the low rateable population and thus low funds, meant that stopbanking was difficult to coordinate. They were erected haphazardly with only some Pākehā land owners being able to construct their own stopbanks and groynes.[479] Stopbanks were not an economic option, and were also thought to have increased the peak water flow thus impacting more on the lower reaches of the Manawatū River.[480]

With the downturn in the flax industry, the Miranui flaxmill operators in the Makerua Swamp decided to drain the land and swamp for farmland and subdivision. The Makerua Drainage Board provided the company with substantial funds to erect 25 kilometres of stopbanks. Although successful in creating the sub-divisioned area now known as Opiki, the flood waters that were destined towards the Makerua Swamp raced on towards the other basins – and in particular the Taonui Swamp and the Moutoa Swamp. The initial stopbank works also often diverted flood waters onto neighbouring lands causing feuds

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476 Horizons Regional Council website, Flood Protection, Moutou Flood Gates Paper. www.horizons.govt.nz

477 A Seifert, *Flood Control Manawatū-Oroua Rivers*, Newspaper article in the Daily Times, 15-17 April 1944. Archives Central File, HRC_00024:Box 4: 1/5/A, p 7.

478 PG Evans, Controlling the Manawatū River Chapter, p 1, in BGR. Saunders and AG Anderson (Eds), *The Geography of New Zealand, Study 1, Introducing Manawatū* (Palmerston North, 1964).

479 Kinght, 2014, pp 163-164.

480 PG Evans, in Saunders and Anderson, 1964.

which continued into the 1950s [481] This stopbanking period was known locally as the 'arms race' and was described by one local resident, Mr Alfred Seifert, as:

> 'water being turned on to other property till the sufferer could build a bank higher than his neighbour to keep it out'.[482]

Despite these setbacks, a number of comprehensive stopbanking schemes were undertaken along the Manawatū River and completed in the mid-1960s.[483]

The Soil Conservation and Rivers Control Act of 1941 led to the formation of the Manawatū Catchment Board in 1943, the first of its kind in New Zealand, and which eventually took over the functions of a number of local drainage boards. With increased pressure for lands to support agriculture, horticulture, and urbanisation the lower reaches of the Manawatū region were becoming increasingly desirable. The Manawatū Catchment Board proposed the Moutoa Floodway project to protect 280 km^2 of regional lands. The chief engineer, Paul Evans, first produced his plan in 1946 which was met with resistance due to a lack of funds.[484] The 1953 flood, however, caused extensive damage to over 2000 acres of pasture, 200 farms, 65 farm buildings, and 52 houses.[485] During the flood, the New Zealand Army helped prevent further damage by laying sand-bags to hinder the flood waters.[486] Farmers encouraged the then Minister of Works, Mr Bob Semple, to visit the ravaged landscape devastated by the flood and he is said to have commented:

> 'You'll have your scheme all right, but you'll have to take the whole bloody catchment.' [487]

This support was no doubt instrumental in the decision to approve the expensive £11.9 million floodway project. The scheme was approved by the Soil Conservation and Rivers Control Council and construction started on the sluice gates at Opiki in 1959.[488]

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481 Knight, 2014, pp 163-164.
482 Quote taken from Jane Pollard, *A tangled yarn – the Seifert family and flaxmilling in New Zealand*, Australia, 2004, p 128, in Knight , 2014, p 164.
483 Manawatū Catchment Board Annual Report of Chairman and Statement of Accounts for the period (1945-1962; Feilding Central Archives, File HRC 00005:2, pp 2 and 6.
484 Knight, 2014, p 166.
485 David Young and Bruce Forster, *Races of the River,* Auckland, 1986, p 146, in Knight, 2014, p 166.
486 Horizons Regional Council website, Flood Protection, Moutou Flood Gates Paper. www.horizons.govt.nz.
487 Knight, 2014, p 166.
488 Ibid.

Parallel, 10 kilometre-long stopbanks flanked a 600 metre wide floodway which bypassed 30 kilometres of meandering river to join the Manawatū River again at Whirokino. The stopbanks were built 5.5 metres high to keep the water in and the sluice gates were built in a fan shape to distribute the water and energy evenly and prevent scouring.[489] The Moutoa sluice gates and floodway were completed in 1962 and are considered one of 'New Zealand's outstanding engineering projects of the 20th century'.[490] The chief engineer of the project warned that while the construction was able to take periodic major flood waters it was unable to eliminate the risk of flooding altogether. Between 1962 and 2002, the sluice gates were opened almost 50 times and in the high flood year of 2004, they were opened six times.[491] From a flood-protection perspective, the Moutoa Floodway was a huge success protecting prime farm land for decades – but during the major storm in 2004, floodwater breached the floodway causing catastrophic damage throughout the region. Approximately 1,000 farms were affected with 5,000 sheep and 1,000 cattle drowning, and 20,000 hectares of pastures remained underwater for a prolonged period of time. Over 2,500 people were successfully evacuated with 1,000 of them remaining homeless for an extended period of time.[492]

Part of the Moutoa Floodway included a section of the Tapuiwaru Swamp which had been drained decades earlier. The Tapuiwaru Swamp, also known as Te Repo o Ihakara, was culturally significant to Ngāti Raukawa with the heart of the swamp a wāhi tapu used for scraping the bones of tūpāpaku prior to removal to burial places elsewhere. Prior to drainage the swamp had teemed with tuna; and the harakeke, raupō, and other vegetation resources had been used for clothing, matting, whare, domestic items, and waka. There were also areas where paru was gathered, which was a special mud that died material.[493]

The Whirokino Cut near Foxton township was another major flood protection scheme installed in the Manawatū River that caused major detrimental effects for the local hapū and iwi, and the wider community. In 1947, H. G. Boniface wrote a masters thesis on Foxton and the surrounding district. He noted that Ngāti Takihiku, a hapū of Ngāti

489 Ibid, pp 167-168.
490 Horizons Regional Council website, Flood Protection, Moutou Flood Gates Paper. www.horizons.govt.nz.
491 Ibid.
492 Knight, 2014, p 169.
493 H Collins, 2015, pp 20 & 34.

Raukawa, was closely associated with the Manawatū River having settled around its lower reaches.

> 'They were water-Māoris; Māoris who lived beside the river and the estuary, and from it gained their livelihood. They carried the foodstuffs from the Whirokino natives to Foxton during the period of extensive Māori trade, and even today retain their skill on and love of the water.'[494]

The earliest Pākehā settlement at the lower reaches of the Manawatū River was Paiaka, established in 1844 and located several miles up-stream of the mouth. This trading post was a centre of commercial activity where small schooners docked as they sailed between Wellington and the North Island west coast rivers. Paiaka and Shannon were also sites of trade in flax between early settlers and local Māori, which was then sent on to Sydney,[495] and there was also trade with Māori who were growing wheat, potatoes, dressed flax, pigs and birds. Reports at the time indicate that there were 'some thousands of Māori' living along the Manawatū River.[496]

The 1855 earthquake destroyed Paiaka and the settlers moved up river to Te Awahou. Other smaller Pākehā settlements nearby included Te Wharangi and Herrington. Te Awahou was probably chosen because it was a relatively flood free site on more solid ground, protected by the sand dune complex. As the port and trading developed, the small settlement came to be considered the 'gateway to the Manawatū'.[497] Te Awahou was renamed Foxton in the 1860s after Sir William Fox. [498] The surrounding vegetation on the stable sand dunes included a:

> 'scrubland of mānuka, toe toe, flax, bracken fern, and cabbage tree. On the sand plains was a forest dominated by Kahikatea, pukatea with sedges and rushes in the open patches. On the flood plain tawa, matai and kahikatea were the main species on the lower areas with mapou, hinau, pigeonwood and tōtara the most common

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494 HG Boniface, *Foxton: Its Site and Changing Function*, unpublished Masters Thesis for Geography (Honours), University of New Zealand, 1947, in ibid, p 16.

495 Manawatū Estuary Trust – A History of the Estuary. Retrieved from http://www.massey.ac.nz/~grapson/metrust/history.php.

496 AGS Bradfield, Early History Chapter, p 2, in Saunders and Anderson, 1964.

497 Foxton Borough Council, *Foxton 1888-1988 The First 100 Years*, Foxton, 1987, p 9.

498 Manawatū Estuary Trust – A History of the Estuary. Retrieved from http://www.massey.ac.nz/~grapson/metrust/history.php.

> species on the higher spots. This vegetation along with the fauna it supported were a vital part of the land resource for early man [Māori and Pākehā]'.[499]

Ihakara Tukumaru was the leading chief of Ngāti Ngārongo who lived on the west side of Matakarapa at Kapahaka, as well as at Awahou, Whakaripa and further upriver on occasion. Nepia Taratoa of Ngāti Huia and Ngāti Parewahawaha had lands in the Awahou district as well as in the upper catchment area of the Rangitikei River. A letter written by Reverend Duncan in 1849 described Nepia Taratoa as 'the most influential chief on the [Manawatū] River'. Meretini Te Akau of Ngāti Huia and Ngāti Kikopiri was well respected and lived with her Husband Mr T.U. Cook and their 10 children at Paiaka, then Awahou and Whirokino. Ngāti Huia chiefs, including Tamihana Te Hoia, lived south of the river at Poroutawhao. Whatiao of Ngāti Takihiku and Ngāti Hinemata, a cousin of Ihakara, maintained ahi ka rights upriver at Koputoroa.[500] The earliest record of contact between Ihakara and Europeans was at the mission station set up at Te Maire as he debated with James Duncan and John Inglis about the new religion.[501] A strong friendship developed between Ihakara and Duncan. Duncan taught Māori aspects of European life such as calculating and the Gospel. However, in a letter to his parents in Scotland, dated 19 January 1854, he doubted the strength of his rate of converting the local Māori population.[502]

> 'For several years the natives of Te Awahou neglected their old cultivations at Te Maire and other places higher up the river; they selected land for gardens and fields at no great distance from their pa or village, and thus could conveniently attend church and school on all occasions. But for some time past they have been becoming more and more dissatisfied with this locality [Te Awahou], as regards cultivations – their crops have turned out very scanty, owing to the lightness of the soil, and the high winds and drifting sands which are experienced here; and this season nearly all their crops have been sown and planted at some distance up the [Manawatū] river where the soil is better, and where shelter is to be found. The people have consequently, been scattered about a good deal, and this has

499 Foxton Borough Council, 1987, p 12.
500 H. Collins, 2015, pp 14-15.
501 Foxton Borough Council, 1987, p 15.
502 Ibid, p 16.

> interfered much with my labours amongst them.... This unsettled mode of living proves very unfavourable to missionary work…'[503]

The main mode of transport up the Manawatū River at this time was by waka and treks. Ihakara Tukumaru carved himself a waka named Te Whangawhanga.[504] Between the 1840s and the1860s, the main mode of transport became schooners which then shifted to steamers introduced in 1863. The Crown began buying Manawatū lands in the area in the 1860s increasing the onset of colonisation and by the 1870s, Foxton Port was at its busiest. Vessels up to 20 tonne were capable of travelling up the Manawatū River.[505] In the 16 December 1865 edition of The Evening Post, the Crown advertised land for sale in the Manawatū District where land in the township, small farm allotments, and timber sections were all available. The advertisement noted the "navigable portion of the river" and the depth of the Manawatū River bar as:

> 'varying from 9 to 12 feet, and is navigable for vessels of that draught for nearly 40 miles (by the river) from the mouth. The timbered sections to be offered for sale form the extreme end of a rich flat block of forest land of great extent (about 60,000 acres) a considerable portion of which is covered with the finest totara timber'.[506]

The Foxton area had six flax mills during the first industry boom in the 1870s. The largest mill, owned by Mr C.J. Powell, was built in 1869 and was situated in the town itself. The produce shipped to Wellington at this time achieved £40 a tonne. During the second flax industry boom in 1889 saw over 50 mills operating in a 10 mile radius of Foxton. The industry provided many Māori with jobs as flax strippers before the invention of mechanical strippers that did the job instead.[507] As the industry slumped in 1919, the flaxmill owners turned to the prospect of farming their lands around Foxton. Unlike the flax industry which profited from the surrounding swampy areas, drier pastures were

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503 Ibid, p 16.
504 R Duff and GSA Biltcliff, 'A Ngāti Raukawa canoe stern-post', in *Journal of the Polynesian Society*, Vol. 59, No. 4, 1950, pp 368-376, cited in H Collins, 2015, p 17.
505 Manawatū Estuary Trust – A History of the Estuary. Retrieved from http://www.massey.ac.nz/~grapson/metrust/history.php.
506 Foxton Borough Council, 1987, p 21.
507 Knight, 2014, pp 147-148.

required. Once again, local settler pressure for industrial change to agriculture led to pressure to implement flood control in the area.[508]

In the 1842 New Zealand Company purchase, which was later disallowed, a local Whirokino farmer, Mr Amos Burr, was allocated a 100 acre farm on the northern bank of the Manawatū River just west of the current Whirokino Bridge. Te Rangihaeata later signed the farm over to Burr in 1852. He grew wheat and potatoes on his Whirokino farm but grew frustrated with the frequent flooding of the river.[509] As early as 1865, Burr had suggested a channel cut at a particular sharp bend that flood waters often went spilling through in a short cut to the ocean missing the loop towards the Foxton township.

Another major flood event in 1880 caused massive erosion on the Manawatū riverbank, including near Herrington, and locals observed the spectacle of Mr Robert Robinson's house floating past the wharf. The depression of the 1880s hit Foxton hard along with the deviation of the railway to Palmerston North in 1881 which was initially planned to go along the coast past Foxton township.[510] Despite these flood events, it took some time for Burr's suggestion of a 'cut' in the river at Whirokino to eventuate, even with local authorities support.

However, in 1935 the Foxton Borough urged the Crown to support a spillway in the area. The Minister of Works, Mr Bob Semple, supported the initiative to create a high level weir and flood channel across the neck of the Foxton Loop.[511] After the approval of a successful tender, construction started in 1941 west of the Whirokino Bridge. The plan was that the Manawatū River would continue on its original course and the spillway would operate occasionally in times of major flood events. Unfortunately, the very natural phenomenon the cut was attempting to control - flood waters – surged through the retaining bank in a 1944 storm creating a channel. Some local residents, including Māori, held the view that the Crown and local authorities intended to create the channel as a permanent structure.[512] The "official" view was that it was 'an act of God'.[513]

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508 Knight, 2014, p 170.
509 H Collins, 2015, p 30.
510 Foxton Borough Council, 1987, p 28.
511 Save our River Trust (SORT), Horizons Regional Council investigation into the feasibility of reopening the Foxton Loop/Piriharakeke, 2012, unpublished report, in Knight, 2014, p 171.
512 Knight, 2014, p 171.
513 Foxton Borough Council, 1987, p 55.

Within a year the local community noticed the Foxton Loop had a sandbank developing that was cutting the loop off from the new river course creating a tidal lagoon. There was also the risk that the borough sewage system was in danger due to the silting caused by the Whirokino Cut. The increased silt also reduced water flow in the Foxton Loop which lead to noticeable pollution in 1945.[514] The source of pollution was attributed to discharges from septic tanks and the effluent from flax mills creating noticeable foul odours. Foxton residents were no longer able to swim, fish, or otherwise enjoy this section of the Manawatū River.[515]

Sustained protests led to the Crown establishing a Commission of Inquiry in 1953 to determine the detrimental effects and potential remedies and costs. The recommendations included moving the flax mill to the main channel near the Whirokino Bridge and:

> '…if at any time the Health Department decides that the discharge from the borough sewerage tanks should no longer flow into the loop, the State would be responsible for the cost of such remedial measures as are considered necessary'.[516]

Fearing a health epidemic, the Health Minister requested an inspection that declared the actions of local authorities were unsatisfactory and pressed for a loader to open the gap and flush the Foxton Loop. Prior to the election in 1949, the then Public Works Minister, Bob Semple, stated his government accepted responsibility and would rectify the situation. Following the election, the incoming Public Works Minister, W.S. Goosman assured the council that his government would honour that pledge. He also stated that the mill effluent could be piped across Matakarapa for discharge and adequate fresh water could be piped from another source. In 1950, the Crown accepted responsibility of the effluent disposal and set plans in motion to rectify the situation.[517] However, this was not to be.

Research into local authority records showed mention of the pollution issues and that the estimated costs to divert the flaxmill effluent, create road access to the Matakarapa Block, as well as other improvements would be £47,372.[518] Instead, the records showed that:

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514 Ibid, p 56.
515 Knight, 2014, p 171.
516 The Whirokino Cut Commission, 1953, p 9, in ibid, p 172.
517 Foxton Borough Council, 1987, p 56.
518 Archives Central File, HRC_00024:Box 4: 1/5/A, p 8.

> ‘It is the emphatic view of the Soil Conservation Council and the Ministry of Works that there should be no interference with the Cut. There has been no question that the Cut has been an unqualified success from a river control and drainage point of view, and the view we take is that the benefits from it far outweigh any consequential disadvantage to Foxton, the Woolpack Company, or to individual land owners.’[519]

There was no specific mention in the reports cited of the impacts on the local hapū and iwi who were detrimentally effected by no longer being able to collect food and other resources, conduct cultural practices, or enjoy recreational activities in this polluted stagnant water body. It was known to local bodies that the northern area of the Matakarapa Block V was in Native occupation and it was noted as the only developed area to be affected by the intended cut as mentioned in the engineer’s report of 1927 to the Manawatū-Oroua River Board.[520] Hapū who had settled at Matakarapa included Ngāti Ngārongo, Ngāti Takihiku, Ngāti Hinemata, and Ngāti Whakatere. Those living at Matakarapa including at Kapahaka on the west side, Kimi-maitawhiti in the north, and Matakarapa on the town side (east) lived off the local land and water resources. The consequential impacts of the Whirokino Cut was a devastating loss for them.

In 1943, the Rerengaohau Block 2 (424 acres) was taken under the Public Works Act for the river diversion. In 1945, 397 acres had been sold by the Māori Trustee to lessee Ikaroa District Māori Land Board in 1945 for reclamation, farming, and other purposes, and in 1956, 209 acres were proclaimed Crown Land and 182 acres sold by the Māori Trustee to the lessee Douglas Stewart. The Rerengaohau 2A Block of 141 acres had also been invested in the Ikaroa District Māori Land Board in 1945 for reclamation, farming, and other purposes, and the Māori Trustee then sold the land to Douglas Stewart in 1956. This block contained the Kahikatea Lagoon, an important mahinga kai.[521] Although compensation was paid for the land, there was little choice for the Māori owners to maintain ownership of their land. However, archival research did not uncover any

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519 Ibid.
520 Ibid, p 3.
521 Te Rerengaohau General Land Block File, OTI 418, Aotea Māori Land Court, in DT Kahotea, *Statement of Summary of Evidence that will be presented January 2016 for Archaeological and Cultural Issues 6 November 2016*, Environment Court, ENV-2016-WLG-000026.

compensation paid to Māori for the detrimental effects caused by the flood control schemes in the Manawatū River catchment area such as the destruction of mahinga kai.

The Whirokino Cut also caused the erosion of an urupā on Rerengaohau Block 3, and the river channel change caused the erosion of another urupā on Whirokino Block 3.[522] Further to this, in 1976, Māori-owned land in Matakarapa was taken under the Public Works Act to erect sewage oxidation ponds on the western side of Matakarapa and for a farm development scheme on the northern end – which was also not supported or sanctioned by local hapū. [523] Although many Māori felt pressured to move from this area, some residents resisted including Hokowhitu McGregor, a carver, and Kereopa McGregor, who both stayed until their deaths. Only a very small area of Matakarapa lands, approximately one acre, remains in hapū ownership today.[524]

There are known cases where Māori raised objections to the Whirokino Cut. For example, Ihakara Tukumaru sought compensation for the losses incurred by the Cut which was not accepted by the County Council, and then threatened to turn away surveyors and set up a toll. In return, the County Council threatened to prosecute Māori landowners. However, Ihakara did take a toll at his house Te Rerenga o Hau for a period.[525] Alternatively, archival research showed that Pākehā land owners engaged legal representation to claim compensation for losses incurred by the flood control works on the river. One relevant example is a letter dated 5 October 1942 from R. Moore and Bergin barristers and solicitors prepared for Dr A.H.E. Wall and H.G. Carver to the Manawatū-Oroua River Board in regards to the Moutoa Spillway. The clients were advised to claim under the Public Works Act for considerable compensation for land depreciation due to the spillway going through their property as well as for the flood damage caused by the stopbank heights being reduced.[526]

Evidence of the Crown's role in the Whirokino Cut is clear in the correspondence from the Ministry of Works to the Chief Accountant of the Department of Internal Affairs, dated 7 May 1953, regarding a Commission of Enquiry about the Whirokino Cut.[527] The

[522] DT Kahotea, pp 5-6.
[523] H. Collins, 2015, p 30.
[524] Ibid.
[525] Manawatū Herald, 20 April, 1880, in DT Kahotea, p 5.
[526] Archives Central File HRC_00024:Box 4: 1/5/A.
[527] Correspondence from the Ministry of Works to the Chief Accountant of the Department of Internal Affairs, dated 7 May 1953, regarding a Commission of Enquiry about the Whirokino Cut. Archives

Commission was appointed by a Governor-General's warrant which was published in the Gazette of 19 February 1953,[528] as well as an extension of time warrant. Members of the Commission were paid fees and allowances.[529]

Hapū of the Foxton area have continued to maintain that the Whirokino Cut was a disastrous decision for them and the wider Foxton community. The prevention of a constant water flow through the Foxton Loop was further compounded by the Moutoa Floodway scheme in 1962, both of which were not for the benefit of the Foxton township but to assist with the quick escape of flood water from upstream farms.[530] After decades of trying to get the Crown and parliament to re-open the Foxton Loop and clear the polluted stagnated waters, they formed the Save Our River Trust 10 years ago – a charitable trust with all the local marae represented as trustees, and which also includes concerned members of the wider Foxton community.[531] In 2013, the Trust collected 1700 signatures on a petition calling for the re-opening of the Foxton Loop which was presented to Horizons Regional councillor, Colleen Sheldon. Trust Chairman, Robin Hapi commented recently in a 2014 local newspaper article that:

> 'the lifeblood of Foxton was taken away without the consent of the Foxton community with the construction of the Whirokino cut. Foxton, which once owed its prosperity to the river, is a town under threat and in desperate need of a solution'.[532]

The Manawatū River was a very important pātaka kai with tuna, īnanga, mahitahi, kōkopu, kōura, piharau, hauhau (a local delicacy mudfish), and other tidal species in the river mouth such as shark, pātiki, mullet, herring, and kahawai, sustaining many generations until recent times. Pā tuna set along the banks, hand-made nets, and sharpened stakes were some of the traditional fishing methods. Wetlands and estuary

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New Zealand, Wellington, R14987967 – Servicing of Government Commission, Whirokino Cut Expenses, Reference IA1 2017, 66/41.

528 The Commission was appointed by the Governor-General's warrant which was published in the Gazette of 19 February 1953 at p 226. Archives New Zealand, Wellington, R14987967 – Servicing of Government Commission, Whirokino Cut Expenses, Reference IA1 2017, 66/41, p 226.

529 Outline of fees and allowances paid to members of the Commission. Archives New Zealand, Wellington, R14987967 – Servicing of Government Commission, Whirokino Cut Expenses, Reference IA1 2017, 66/41.

530 R Hapi, in 'River Trust Critical of Horizons Report', Press Release from Save Our River Trust, 29 March 2012.

531 TK Teira, in Poutama, Spinks, and Raumati, 2016, pp 44-45.

532 M Grocott, 'Foxton Would Thrive After River Rescue', in *Manawatū Standard*, 24 February 2014.

birds were once plentiful in the lower catchment of the Manawatū River such as parere, kūaka, pūkeko, kōtare, and kawau.[533] Early archaeological evidence of the Lower Manawatū area indicated settlement at least from 1400 AD. Analysis of a moa hunters' camp revealed an environment which yielded tua tua, mud snail, cockle, pipi, toheroa, snapper, seal, shark, and the land kākā, kererū, kākāpō, parakeet, duck, takahē, pūkeko, and moa. Vegetation from open spaces of land included evidence of fern roots and pūhā, and from the bush: hinau, tawa, and mamaku berries.[534] It was once thus a region of dense forest, well supplied with edible berries and birdlife, with rich soil for the cultivation of large crops of kūmara, and of waterways filled with fish and tuna.[535]

Substantial cultivation sites such as Te Maire no longer sustain whānau and hapū, and the river is now severely polluted with food sources largely depleted as a result – all of which has had a significant impact on the wellbeing of the associated hapū and iwi. The impacts of degraded water quality on fisheries and on the wider wellbeing of hapū and iwi is detailed in Part Two of this report.

There were four taniwha in the Manawatū River significant to the hapū of Ngāti Raukawa: Papangaio, a kaitiaki who protected the Manawatū River mouth and inland tidal areas; Peketahi who protected the Foxton Loop section of the river; Takere-piripiri who protected the wetlands and inland fresh waterways; and Mukūkai who lived in the coastal environment and who occasionally travelling up river.[536] A recent Cultural Impact Assessment Report stated that Papangaio is still concerned with the pollution of the Manawatū River.[537]

[533] H Collins, 2015, pp 17 & 19.
[534] Foxton Borough Council, 1987, p 12.
[535] Boniface, 1947, p 7, in H Collins, 2015, p 27.
[536] Ngāti Raukawa signage developed by Te Kenehi Teira and Heeni Collins for Horizons Regional Council and the Manawatū River Leaders' Accord. Permission provided via personal communication, Heeni Collins, email, 4 April 2016.
[537] H Collins, 2015, pp 18.

3.4 Gravel Extraction

The extraction of gravel from rivers is a further mechanism used by local bodies to control flooding in the inquiry district as it keeps river beds from rising and maintains their capacity to manage increased water flow in flood events. Such extraction is, however, a delicate balancing act as over-extraction can lead to increased river bank destabilisation and erosion, while under-extraction can result in rising river beds.[538] In the inquiry district, large quantities of gravel have been extracted from the major river systems since the late 1800s: the Oroua River; Manawatū River; Ōhau River; Ōtaki River; and the Waikanae River.

Gravel extraction has also developed into a lucrative industry, with the gravel being used to construct the district's early rail and roading transport systems – and which continues today with the gravel being used to maintain existing systems and for the construction of new roads. The extraction industry has, however, long been an exclusive industry 'dominated by the Crown and local authorities, both in regulation of operations and in the extraction itself'.[539]

The signing of Te Tiriti o Waitangi in 1840 guaranteed to hapū their ongoing tino rangatiratanga of their taonga waterways. In a Māori worldview, the resources of these waterways – from the water to the sand, gravel, and other minerals therein – formed part of an indivisible whole. As such, these gravel resources were in the possession of hapū and iwi. Suitable gravel to build the roading infrastructure was in great demand by the county councils of the inquiry district. In 1889, Hoani Taipua and Ropata Te Ao, representing the native owners of Muhunoa Block No. 1 near the Ōhau River, agreed to the sale of 2398 cubic yards of gravel to the Horowhenua County Council upon payment of £3.5 per cubic yard or a lump sum of £34:9:5. They agreed that additional gravel could also be bought at a similar price by the council or the Wirokino Road Board to complete the metalling of the county and Muhunoa district roads.[540] In many cases, even if the Māori land owners objected to the taking of their gravel they did not raise complaints as

538 Personal communication, Colin Munn, phone call, 8 February 2017. Munn is the current Team Leader for Flood Protection Operations at Greater Wellington Regional Council, Wellington.
539 D Alexander, Rangitikei River and its Tributaries Historical Report, 2015, p 442.
540 Agreement by Hoani Taipua and Ropata Te Ao, 10 December 1889. Archives Central file, HDC_00314_1889-5.

they were under the assumption that the local authorities would not undertake such actions unless they were entitled to under some legislative right.

Indeed, extensive searches of archival material relating to gravel extraction revealed very little specific reference to consultation with hapū and iwi or where their views and values have been taken into account. However, some correspondence was discovered related to Māori landholders, the Hunia whānau, being paid a royalty in 1897 of £39:14:6, on metal taken from part of the Horowhenua Block. Handwritten documentation indicates that the original correspondence was lost in a fire of Council records for that period, but that £6:12:5 had been paid to Rakera Hunia, Wirihana Hunia, Warena Hunia, Here Te Upokoiri, Rakera Hunia and a further £6:12:5 split between Rangipo Mete Paetahi, Rawea Utiku and Rupenea Mete Kingi. Lawyers for the whānau followed up on the matter in 1904, requesting an account of all metal taken since the royalty settlement in 1887, and requesting a cheque be forwarded to them for the amount due, accordingly. No further correspondence or mention of such ongoing royalty being paid, or not, to this whānau was found.[541]

With the passage of successive legislation that transferred the ownership of riparian lands and river bed resources to the Crown and private settler interests, so too transferred the ownership of much of the gravel in the rivers of the inquiry district. In order to access the gravel in rivers where riparian land was owned by Māori or others, however, the Crown was able to confiscate such lands under the Public Works Act 1876 to ensure a ready supply for public works such as public railway and roading projects.

In 1908, the Crown passed the River Boards Act which empowered river boards to extract gravel for river works without having to actually take riparian land and without being liable for compensation, while owners were prohibited from doing so without prior board approval. River boards were then free to sell the gravel with fees being able to be charged to allow them to recoup their administrative expenses – except for that removed by county, borough or city councils for their own works and except for the metal removed by farmers from waterways on their own lands.[542]

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[541] MCB correspondence regarding royalty due to members of the Hunia family on metal taken from

[542] Letter to Manawatū Catchment Board from FG Opie, Barrister and Solicitor, 11 April 1949. Archives Central file HRC 00023:23/33E.

Figure 21: **Gravel crusher at Waikanae a key facility in highway reconstruction.**[543]

For example, in 1923, the Levin Borough Council was interested in suitable gravel for the township in Levin. A report prepared by Mr Skitrop informed the council that the Ōhau River gravel appeared favourable.

> 'In reference to the suggestion of obtaining metal supplies, from the Ōhau River, I beg to state that I visited that locality this morning, and am satisfied that the supply of good river shingle and boulders is practically unlimited. I understand that a private firm is prepared to set up a crushing plant and deliver suitable crushed and screened metal and chips at a fairly low cost.'[544]

Skitrop went on to recommend taking gravel after flood events as the shingle would be free from sand and any money spent would remain in the district. Council members considered options for gravel supply, including from Napier, Belmont, and Paekākāriki, but in concluding their considerations they chose to support supply from the Ōhau River.[545]

[543] Photograph taken in the 1920s, Brown Collection, in A Dreaver, 1984, p 283.
[544] 'Street Improvement Scheme: Engineer to Reside in Levin: Ōhau Metal Favourably Reported On, in *Horowhenua Chronicle*, 16 November 1923.
[545] Ibid.

The powers of river boards were then vested in catchment boards when established under the Soil Conservation and Rivers Control Act 1941.[546] With a by-law change in 1951, the Manawatū Catchment Board was able to charge metal extraction companies an annual levy and a royalty fee per cubic yard, with councils and farmers remaining exempt – a move that was met with resistance from the metal extraction companies.[547] Archival searches of Manawatū Catchment Board metal permit files from 1949-1959 revealed a process whereby they acquired possession of lands that contained waterways with gravel extraction potential which then enabled them to then issue permits to interested parties to extract metal for a fee.[548] This is particularly evident in the case study on the Ōtaki River in section 3.3.7 of this chapter.

Archival searches also revealed concerns about damages to rivers from gravel extraction, including:

> 'the manner in which some operators had been removing shingle from rivers, resulting in large holes being made or operations taking place in such a manner as has resulted in the course of a river being changed, erosion has occurred or stopbanks have been adversely effected. Likewise, the removal of shingle has not been carried out as directed, or with the equipment which will do the least amount of damage when in operation, also reject material has been placed in such positions as will impede the flow of water during flood conditions'.[549]

In response, the Manawatū Catchment Board proposed strict supervision of gravel extracting operators in a new by-law in 1967 that came into effect on 1 April 1968 with a new, increased fee structure for both the annual licence fee and royalty payments based on the volume of take – which was again met with resistance from gravel extraction companies,[550] many of whom were not paying royalties. Many if not all of the county councils in the inquiry district also refused or objected to paying fees and submitting applications for gravel take – whereby the Board had no record of their take.[551] Farmers

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546 Letter to Manawatū Catchment Board from FG Opie, Barrister and Solicitor, 11 April 1949. Archives Central file, HRC 00023:23/33E.
547 Manawatū Catchment Board Shingle and Other Metal Permit and Manawatū Catchment Board ByLaw Section 29. Archives Central file, HRC 00023:Box 17.
548 Manawatū Catchment Board. Archives Central file, HRC 00023:23/33E.
549 Manawatū Catchment Board concerns re shingle take. Archives Central file, HRC 00024_24/10.
550 Ibid.
551 Manawatū Catchment Board shingle agreement. Archives Central file, HRC 00024_24/10.

continued to be exempt from the annual license fee where they were removing gravel from rivers for their own farm use with their own equipment.[552] There were also no records kept of extraction takes by farmers, what methods were used, or of any damage to river banks or water flow resulted.

Archival searches of Manawatū Catchment Board files in the late 1960s-early 1970s showed their frustration in trying to enforce the by-laws relating to gravel extraction, exacerbated by their own leniency towards many operators. At the same time they were contending with increasing public concerns about the environmental degradation that was occurring and their failure to enforce their own regulations.[553] Indeed, a Manawatū Catchment Board file note dated 7 April 1977, stated they did not actually know the total amount of shingle being extracted from rivers in its district, despite the fact it was becoming scarce.[554]

There were no records that mentioned the concerns that were being raised by hapū and iwi, as highlighted in the oral interviews for the inland waterways cultural perspectives projects.[555]

Over the past 170 years, significant quantities of gravel have been extracted from many of the major rivers in the inquiry district. Catchment boards often allowed excessive amounts of gravel to be removed which damaged the stability of the river beds and, in extreme cases, caused railway and roading bridges to become unstable or collapse. A study of the Ōhau River in 1982 showed that the transportation of gravel downstream had previously been between 7,000 and 13,000m^3 per year. Extraction was, however, significantly higher at 27,000m^3 of gravel per year, with a deficit of 14,000 to 20,000m^3 of gravel per year. At that time, 55 per cent of all gravel was being extracted by one operator - Speirs Concrete Ltd – immediately upstream of the State Highway 1 and Railway bridges. In 2002, Horizons Regional Council commented that it was:

> ‘typical of large gravel operations at that time, with gravel taken directly from the river using a dragline. The practise has now been stopped in this Region… The

[552] Correspondence between the Manawatū Catchment Board and Federated Farmers. Archives Central file HRC 00024_24/10.
[553] See Archives Central file HRC 00024_24/10
[554] Manawatū Catchment Board note regarding shingle extraction and permits, April 1977. Archives Central file, HRC 00024_24/10.
[555] See, Poutama, Spinks, & Raumati, 2016.

over-extraction of gravel by Speirs caused the river to widen and deepen upstream and downstream of the site'.

In response to concerns about the stability of the bridges and the river bed, a number of remedies were attempted including repiling the bridges, a rock grade control scheme, and deepening and artificially straightening the channel downstream. By 1982, gravel extraction from the Ōhau River had reduced to 19,000m^3/year. However, Speirs Concrete Ltd ceased operations at the site in 1985 due to the continued concerns about the bridges.[556]

The photograph below of the Oroua River after the 1893 flood shows the destruction flooding and river bed instability from excessive gravel extraction can have on railway and roading bridges. Ngāti Kauwhata and associated hapū continue their historic battle with local authorities over the extraction of gravel from the Oroua River, as described in the following case study.

Figure 22: **Damage to Aorangi Bridge on the Oroua River, after the 1897 flood.**[557]

Case studies for the Oroua and Ōtaki rivers were selected, in part, due to the fact that adequate archival records were available to create a reasonably comprehensive narrative

[556] Horzions.mw staff, *The Ōhau River and its natural resources*, 2002, Palmerston North, p 10.
[557] K Napier, Feilding in Focus: A Glimpse into Early Settlement Life (Feilding, 1981), p 8.

of what occurred in the years where the Manawatū Catchment Board was the regional authority in charge of regulating gravel extraction, namely the years 1943-1989.

3.4.1 Case Study Ten: Oroua River

As outlined in Chapter 2, Ngāti Kauwhata continue to hold the view that they never relinquished their possession of or ownership rights to the Oroua River. In the 1997 Manawatū-Wanganui Regional Council hearing on the continuation of the Manawatū District Council's consent to discharge treated sewage effluent into the Oroua River, Sir Mason Durie said:

> 'The iwi authority had mana whenua status over the area bordering the Oroua River north of Rangitāne interests. Several settlements were established on both sides of the river after the settlement in 1831, and today the three principal marae of Ngāti Kauwhata, Kauwhata, Aorangi, and Te Iwa continue that association. Tribal members retained ownership rights over land bordering the river… the river had been an important taonga for iwi for more than 160 years. It was a source of food, including tuna, water cress, kōura and recently trout. It also provided opportunities for spiritual renewal. Often, its waters had been used for both healing and cleansing. Those uses had been seriously compromised over the years by "assaults", including gravel extraction, water diversions, and discharges … the cultural significance of the river had been undermined…. The main concern was the threat to the mauri (life-force) of the river. The state of mauri could be measured in terms of food sources, the presence of algae, odours, flow rates, and the relationship of whānau to the river. When it was challenged, the cultural well-being of the people was also challenged. Thus the tribe had suffered.' [558]

In interviews for the inland waterways cultural perspectives project, Ngāti Kauwhata claimants also raised the issue of council consents for gravel extraction on a Māori-owned section of the Oroua River – but where no royalties or compensation have been paid to the owners.[559] One such example was of gravel extracted on the Māori-owned land block

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[558] J Saunders, 'Effluent Discharge Challenged', in Manawatū Standard, 7 July 1997, p 2.

[559] See the interviews with representatives from Ngāti Kauwhata, and in particular Steve Bray, Donald Tait, and Edward Tautahi-Penetito, in Appendix V.

at Awahuri: at Sandon (Carnavon) Sec 152 Sub, 6 C No.2, 7.8 hectares with 3 owners and 3136 shares.[560]

> "The Oroua River became the gravel pit for all the roads. They got all the metal out of there … Awahuri was the biggest metal extraction [site] in the Manawatū.' Steve Bray, Ngāti Kauwhata.[561]

Dennis Emery stated that their Ngāti Kauwhata kaumātua realised gravel was being extracted from the river adjacent to their lands with the trucks taking it out via their paper road.[562] In 1937, Ngāti Kauwhata won their fight with the local authority for gravel extraction to cease as it was impacting on tuna stocks, but it started up again following World War Two. Over time, numerous verbal agreements were made with various local bodies regarding royalty or compensation payments for gravel extraction but these have been consistently dishonoured by the local bodies involved.

Ngāti Kauwhata had also attempted to establish their own gravel extraction enterprise, consistent with their tino rangatiratanga of the Oroua River as affirmed in Te Tiriti o Waitangi.

> 'We tried to do something as a business … we wanted to bring a crusher in and crush the metal because we were like weighing up the advantages. We got a quote from a man who had a crusher. He told us of all the benefits you would get if you could bring the crusher down here instead of just getting raw metal. You would have six different kinds of gravel that you could use and sell, and each one dearer than the other, so it would be more profitable. So we had the setup ready to go but access was denied; denied by regional council because they on sold it to the likes of roadside construction. There's the iwi trying to do something for themselves and they're being denied access to their own resources.' Rodney Graham, Ngāti Kauwhata. [563]

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560 Personal communication, Dennis Emery, 14 February 2017. Data and information provided by Dr Garth Harmsworth at Landcare Research, Massey University.

561 Interview with claimants from Ngāti Kauwhata at TROR, Levin, 8am, 6 September 2016, in Appendix V.

562 Personal communication, Dennis Emery, skype, 18 January 2017.

563 Interview with claimants from Ngāti Kauwhata at TROR, Levin, 2pm, 6 September 2016, in Appendix V.

More recently, an agreement was reached with Horizons Regional Council that gravel was able to be removed from the Oroua River, from Armadale to the upper reaches – on the understanding that Ngāti Kauwhata would receive a percentage of the royalties which the council had put into a specific fund, originally set-up for stopbank works: the He Tini Awa Fund. However, access to this fund has not been forthcoming.[564]

To date, Ngāti Kauwhata are yet to receive any royalties or compensation payments for metal extracted from the Oroua River adjacent to their lands, and the owners continue to negotiate for compensation for past and present gravel extraction with the Horizons Regional Council today. This point is returned to at the close of this case study.

Evidence that the Crown legislated the removal of gravel from rivers beds is evident in correspondence between the Commissioner of Crown Lands and the Manawatū County Council regarding the removal of gravel from the Oroua River bed in 1903. In a letter dated 18 August 1903, the Commissioner stated:

> 'by Section 161 of "The Public Works Act, 1984", you are only empowered to remove gravel from a river bed which impedes the flow of the water".[565]

Gravel extraction from the Oroua River:

For the Oroua River, archival records were found which related to gravel extraction from the river between the years 1951 and 1989. The following pages are of summary analysis of those activities.[566]

The County of Manawatū Chambers notified the Manawatū Catchment Board in 1951 of its intention to take 55,000 cubic yards of metal from the Oroua River during the 18 months from October 1951, while recognising that other parties also already had permission to take metal from the river in the near vicinity of the Kopane Bridge, which

[564] Interview with claimants from Ngāti Kauwhata at TROR, Levin, 8am, 6 September 2016, in Appendix V.

[565] Correspondence between the Commissioner of Crown Lands and the Manawatū County Council regarding the removal of gravel from the Oroua River Bed in 1903, letter dated 18 August 1903. Archives New Zealand, Wellington, R24011044 – Commissioner of Crown Lands – Gravel from Oroua River Bed, Archives Ref LS-W1 422, record 23140.

[566] This analysis was researched and written by Derrylea Hardy.

was where the Council was interested; approval was granted. Likewise, approval was granted to a Mr Arnott to work metal deposit from the Oroua River that same year.[567]

In 1952, the Ministry of Works requested 4000 cubic yards of metal from the Oroua River, adjacent to the Highway Bridge at Awahuri, for roading purposes during 1952.[568] The Manawatū Catchment Board sought clarification from the Soil Conservations and Rivers Control Council as to whether it could charge the Ministry of Works its newly instituted 10/-d annual license fee plus a further license fee of 3d per yard for every yard removed beyond 40 yards to cover the cost of supervision and the removal of shingle.[569]

Solicitors for Mr Arnott wrote to the Manawatū Catchment Board on 8 April 1952, who had a license from the Kairanga County Council to take metal from the Oroua River below the Kopane Traffic bridge, which was being transferred to a syndicate incorporated under the Companies Act, "The Oroua Shingle & Sand Company Limited". Furthermore, it was noted that the Manawatū County Council also had a license to take up to 3000 cubic yards of metal from the same site at a royalty of 6d per yard, the same rate at which Mr Arnott was paying royalties to the Kairanga County Council. Thus, it was claimed that Mr Arnott should be able to take up to 3000 cubic yards of metal for free, except for the royalty payable to Kairanga County, which was being removed from the river bed by the Manawatū County Council under the supervision of its engineer.[570]

In a letter to the Manawatū Catchment Board dated 21 January 1958 from the Solicitors of I.P. Shannon Limited, Road Freighters Limited and Mrs A Parker,[571] it was stated that the aforementioned parties were to set up an incorporated private limited liability company, Simon St Shingle Company Limited, 'the main object of which was to win metal from the Oroua River at Simon Street and to sell the same and manufacture products therefrom'. The Manawatū Catchment Board approved this company's

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567 Letters between the County of Manawatū and the Manawatū Catchment Board re metal extraction on the Oroua River. Feilding Central Archives, File HRC 00023:23/33E.

568 Ministry of Works request to extract metal for Road Purposes. Feilding Central Archives, File HRC 00023:23/33E.

569 Manawatū Catchment Board letter seeking clarification regarding royalty and license fee charges. Feilding Central Archives, File HRC 00023:23/33E.

570 Communications regarding license fees, metal extraction from Oroua River by Mr Arnott. Feilding Central Archives, File HRC 00023:23/33E.

571 Letter to the MCB from the Solicitors of I.P. Shannon Limited, Road Freighters Limited and Mrs A Parker, dated 21 January 1958. Feilding Central Archives, File HRC 00023:23/33E.

application and granted it a license to remove shingle at a fee of 10/-d per annum.[572] The Manawatū Catchment Board chief engineer noted that the issuing of such a license by the Board did not give access or rights over any private property nor absolve the company for any liabilities for damage to property which could be shown to be due to or aggravated by works carried out by the company in the course of removing shingle from the river, and that the Manawatū Catchment Board reserved the right to cancel this annual license at any time should operations prove to be injurious to the river stability. Although such stipulations were laid out in letters from Manawatū Catchment Board to the licensee holders regarding their responsibilities for safeguarding the property and the stability of the river, no mention was made of any responsibility to safeguard the customary uses of hapū and iwi of the Oroua River, or the fact that access to gravel extraction points was often across Māori-owned land.[573]

An Evening Standard article on 15 March 1968, 'Shingle Regulations Worry Oroua County', noted concerns about new fees and complex regulations imposed by the Manawatū Catchment Board to regulate the take of shingle from all waterways in its districts. This new fee would cost the Oroua County Council an extra $120 each year to remove its normal requirements of between 10,000 to 15,000 cubic yards of metal. The chairman of the Oroua County Council admitted that removal of metal was under the control of the Manawatū Catchment Board 'but the metal belongs to the people', and was encouraged at a meeting in Feilding to strongly object to the new Manawatū Catchment Board regulations and fees.[574]

D Higgins & Sons Ltd applied for an annual license for 1977-1978 to remove 5000 cubic metres of gravel, sand, or shingle from the Oroua River, Awahuri Bridge (a hand drawn map identifies the area),[575] with a $100 deposit, and an agreement to pay the inspection fee of 3 cents per cubic metre on all metal removed, fees payable quarterly; for which

[572] Letter from Chief engineer of the MCB dated 6 March 1958 to the Solicitors of I.P. Shannon Limited, Road Freighters Limited and Mrs A Parker, i.e. the Simon Street Shingle Company Ltd. Feilding Central Archives, File HRC 00023:23/33E.

[573] It is assumed this refers to the area surrounding the shingle extraction site, and its access routes.

[574] Evening Standard article, 15 March 1968. Feilding Central Archives, HRC_00024_24/10.

[575] Higgins Annual Application for License to Remove Shingle from Oroua River. Feilding Central Archives, HRC_00024:81:24/4.

Higgins advised that they had taken 1668.36 cubic metres of metal off the Oroua River each for the period of February-March 1978.[576]

Subsequent quarterly reports for the relevant waterways indicate that Higgins removed 710.05 cubic metres from the Oroua River at Awahuri in the quarter ending December 1980.[577] Interestingly, despite continuing to apply for permits to extract materials in the Oroua River (e.g., Nelson St;[578]River Channel, River Beach[579]), nil returns were noted from that point on for the Oroua River in the 1957-1989 period,[580] other than for the quarter ending 30 September 1987 when 336 cubic metres of base course metal was taken from Oroua River at Simon Street, with a fee received by the Manawatū Catchment Board for $2214.16, accordingly.[581]

In a letter from the Manawatū Catchment Board to Higgins Redimix Concrete (Fdg) Ltd on 29 July 1987,[582] the Board notes that Higgins had applied to extract 2000 cubic metres of beach gravel from Nelson St, Oroua River; however, survey records indicated that:

> 'the Oroua River has experienced progressive channel degradation throughout Feilding Borough, and the Board wishes to avoid continued degradation by limiting the total quantity of river beach extraction'.

The letter also stated that for the current year, only the Feilding Borough Council had received a permit to extract from that location, with Oroua County also holding a permit for limited extraction from Borthwicks beach. The total extraction from the area was expected to decrease further into the future. Thus, the $66 permit application fee (including GST) was refunded to Higgins.

The Manawatū Catchment Board records for Shingle Licences for D Higgins, Roxburgh Cres (1984-1989), show that for the quarter ending June 1987 there was a nil return for

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576 Higgins Shingle Removal Quarterly Report to MCB for Oroua River. Feilding Central Archives, HRC_00024:81:24/4.

577 Higgins Shingle Removal Quarterly Report to MCB for Oroua River, Dec 1980. Feilding Central Archives, HRC_00024:81:24/4.

578 For example, Higgins Application, Oroua River, 1987-1988. Feilding Central Archives, HRC_00024:81:24/4.

579 Higgins Application, Oroua River, 1988-89. Feilding Central Archives, HRC_00024:81:24/4.

580 For example, Nil Return, Oroua River, Higgins Shingle Removal Quarterly Report to MCB. Feilding Central Archives, HRC_00024:81:24/4.

581 Higgins Shingle Removal Quarterly Report to MCB for Oroua River, Sept 1987. Feilding Central Archives, HRC_00024:81:24/4.

582 Communication between MCB and Higgins, July 1987. Feilding Central Archives, HRC_00024:81:24/4.

both Oroua River and Te Matai Road; although it appears that 2800 cubic metres was taken from the Oroua River at Simon Street during various quarters throughout 1986-1988, despite no application being made for some of the given quarters.[583]

In 1989, responsibility for the regulation of gravel extraction passed to the newly formed Horizons Regional Council. They conducted a gravel resource study on the Oroua River in 2012.[584] The report concentrated on survey data taken in 1990, 1998, and the summer of 2011-12 which included 'cross-sectional' data taken every 1.5 kilometres along a 43.5 kilometre stretch of the river from the confluence with the Manawatū River up to a confluence just above Kiwitea Stream.[585] The main finding of the report was a general trend of degradation in:

> 'the volume of gravel in the upper half of the reach (from Kaimatarau Road to a point just upstream of the confluence with the Kiwitea Stream), and an aggradation trend in the lower half (down to the Manawatū confluence)'.[586]

Horizons Regional Council did not consider the gravel bed trend to be significant as:

> 'the volumes of gravel involved are small. In fact, the gravel resource in this reach would appear to be in a dynamic equilibrium with the quantity being transported from the upper half of the reach being balanced by the quantity that has been deposited in the lower half of the reach'.[587]

These volumes are shown in Figure 23 below. The report concluded by stating, however, that while the volume of gravel beneath the active channel in the upper half of the reach was insignificant, there is a significant quantity of material is entering the river system and being deposited on the banks and beaches of the lower reach of the river.

> 'In total there are approximately 900,000 cubic metres more material beneath the active channel now than there was in 1998.'[588]

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583 Feilding Central Archives, HRC_00024:81:24/4/1.
584 J Bell, Oroua River Gravel Resource Study Horizons Regional Council, September 2012, Report #: 2012/Ext/1255.
585 The height of the river bed from one river bank to the other.
586 J. Bell, 2012, p 15.
587 Ibid.
588 Ibid.

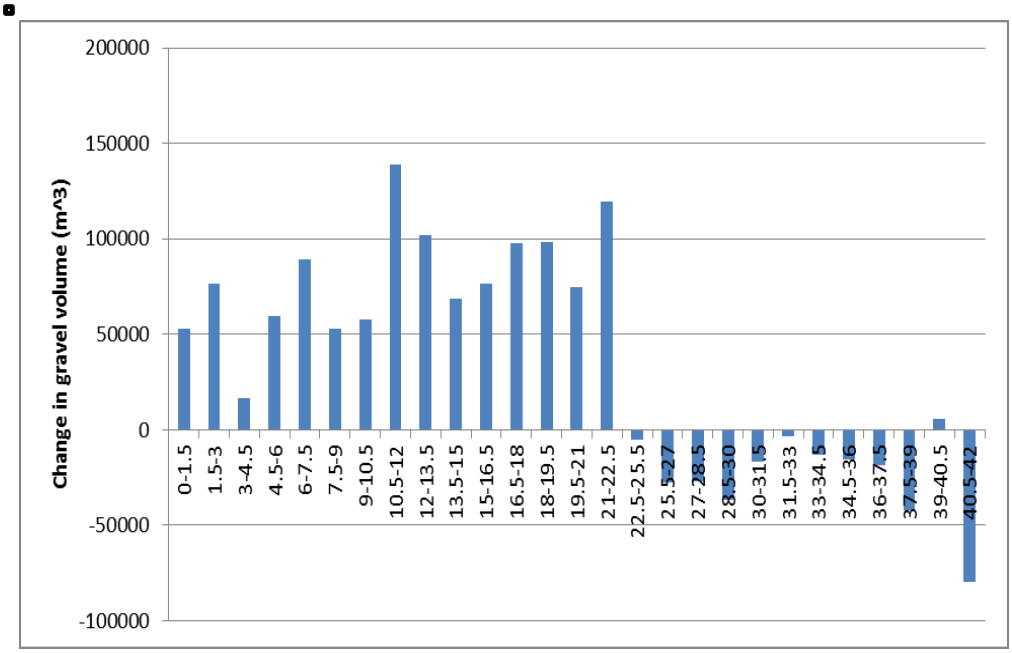
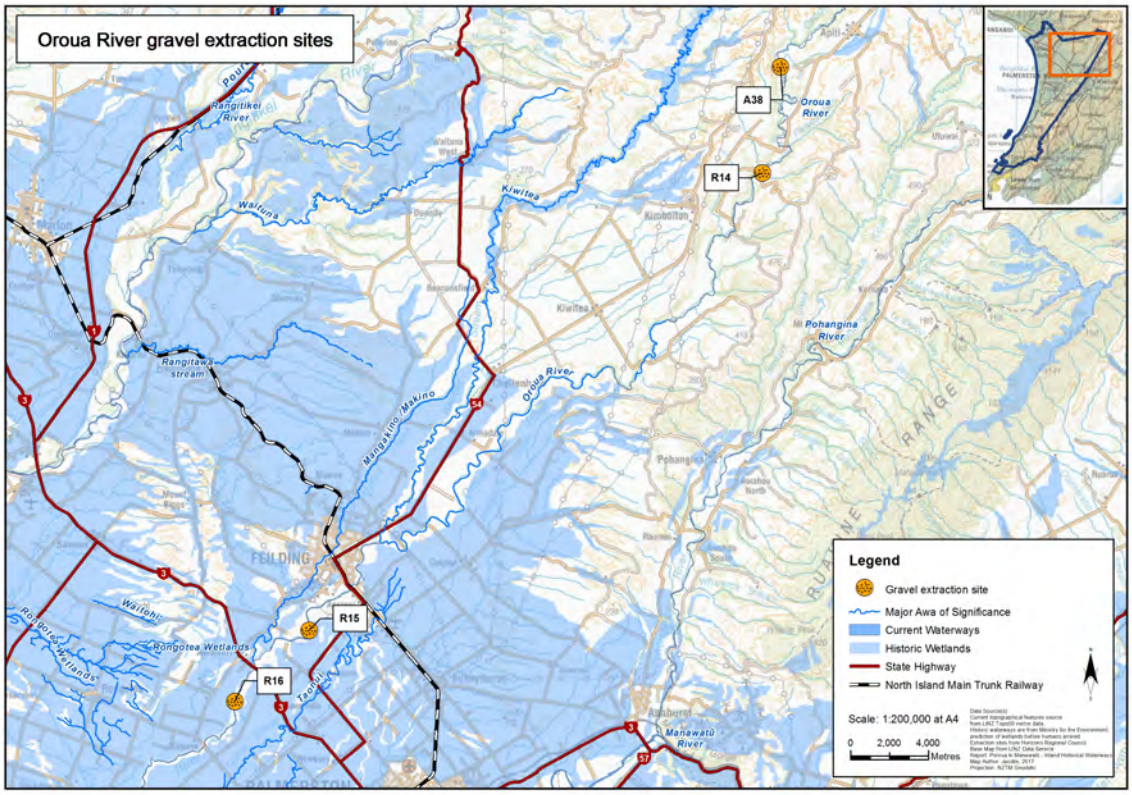


Figure 23: **Change in volume of gravel beneath the active channel of the Oroua River since 1998.**[589]

Exactly where the material was coming from was not clear. However, the author noted that the additional material was likely to consist of a greater proportion of fine silt particles and sediment rather than heavier material that makes up the bed of the river, i.e. that 'there is not 900,000 m3 of gravel that can be extracted from this reach of the river'. The study also noted that during the time period of 1990-1998, there was a lot of work carried out on the Oroua River, particularly through the Kopane reach and 'it is not clear, how these works may have impacted the gravel regime of the river'. The final statement in the conclusion was that further survey and analysis be conducted in 2018-19.[590]

In 2017, four council approved gravel extraction sites continue to operate on the Oroua River with one site (just below Feilding in Map 38 below) located on Māori owned land.

[589] Ibid.
[590] Ibid, pp 15-16.



Map 38: **Oroua River gravel extraction sites in 2017.**[591]

Calculating the value of gravel extraction:

Drawn from the gravel extraction estimates of Horizons Regional Council, the following table provides the volumes extracted from the Oroua River over the 24 year period from 1992-2015.[592]

591 Created by Jacobs courtesty of Crown Forestry Rental Trust.

592 J Roygard, personal communication, email of 2 March 2017. Joygard is currently the Group Manager, Natural Resources and Partnerships at Horizons Regional Council, Palmerston North.

Table 1: **Gravel extraction volumes from the Oroua River, 1992-2015.**

Year	Volume of gravel extracted (m^3)
1992	678
1993	1059
1994	1204
1995	3199
1996	6210
1997	6602
1998	11053
1999	16328
2000	26174
2001	23110
2002	29983
2003	16585
2004	30169
2005	16508
2006	11108
2007	26683
2008	108036
2009	86412
2010	8100
2011	49493
2012	46173
2013	31931
2014	37702
2015	16100

Longburn Shingle Company Limited currently supplies gravel to local concrete plants – a business that first started operations in Palmerston North in the 1950s and which expanded to supply concrete plants in Feilding and Foxton in the 1970s. Using their 2016 price list,[593] and using the gravel extraction volumes in Table 1 above, an approximate value of the gravel extracted from the Oroua River in the 24 years from 1992-2015 has

[593] http://longburnshingle.co.nz products dropdown list, price list on spreadsheet at the bottom of the page. Price list effective 1 September 2016.

been calculated. The total amount of gravel extracted was 610,600 cubic metres, and the average price for gravel and shingle products was $27.24 per cubic metre, equating to a value of approximately $16.6 million.

While this retail value does not equate to the much smaller value of the levies received by council, it does indicate the value that has been able to be accumulated by private interests – and indicates something of the value which Ngāti Kauwhata has been denied by being prohibited from developing their own gravel extraction enterprise as owners of the river at Awahuri.

Negotiating compensation for gravel extraction:

On 18 January 2017, Ngāti Kauwhata representatives met with Horizons Regional Council staff members including Jon Roygard, the Group Manager for Natural Resources and Partnerships, to address the fact that the council had dissolved the He Tini Awa Fund in 2016 of which a considerable proportion of the accumulated funds had originated from gravel extracted from the river adjacent to their Awahuri block lands.[594] Of particular note in the meeting was the fact that Ngāti Kauwhata had unsuccessfully applied for $18,000 of council funding under the He Tini Awa Fund for a five-year riparian planting programme along the river by the AFFCO site.[595] Indeed, Ngāti Kauwhata had never received any funding support from the He Tini Awa Fund.[596]

Jon Roygard subsequently sent documentation relevant to gravel extraction from the Oroua River, and on the formation and closure of the He Tini Awa Trust.[597] The Charitable Trust was formed in 2002 for the purposes of promoting and facilitating projects for the restoration, preservation, enhancement, or creation of all classes or natural ecosystems and landscapes within the Manawatū-Wanganui region. The Trust Deed declared nine foundation trustees that included farmers, Fish and Game, business operators, a lecturer, and one person retired. There was no tangata whenua representation

[594] Personal communication, Dennis Emery, skype, 18 January 2017.
[595] Dennis Emery Chairperson on behalf of Nga Kaitaki o Ngāti Kauwhata Incorporated, He Tini Awa Application Form, Project Name: Coylton Stream Natives Plants Replacements Programme, 19 March 2015.
[596] Dennis Emery Chairperson Nga Kaitaki o Ngāti Kauwhata Incorporated, He Tini Awa Notes for the Horizons meeting 18 January 2017. Provided by Dennis Emery, 18 January 2017.
[597] Jon Roygard, personal communication, email 2 March 2017. Joyguard is currently the Group Manager Natural Resources and Partnerships at Horizons Regional Council, Palmerston North.

on the Trust.[598] The Charities register provided annual returns for the period 2009 to 2015 and the approximate figures are as follows:

- 2009 Total Gross Income was $100,000 with a Total Asset funds of $181,000;
- 2010 Total Gross Income was $42,000 and Total Asset base of $187,000;
- 2011 Total Gross Income was $51,000 and Total Asset base of $155,000;
- 2012 Total Gross Income was $63,000 and Total Asset base $202,000;
- 2013 Total Gross Income was $18,000 and Total Asset base $156,000;
- 2015 Total Gross Income was $53,000 and Total Asset base $166,000.[599]

In Many 2016, the He Tini Awa Trust was wound up by request of the Regional Council and the remaining funds were transferred to the Awahuri Forest-Kitchener Park Trust.[600] In an attempt to salvage some Ngāti Kauwhata influence over the use of the funds financed by resources including those obtained from the Oroua River, Dennis Emery stood for and was appointed as a Trustee of the Awahuri Forest-Kitchener Park Trust.[601]

Horizons Regional Council continues to receive levies from four approved gravel extraction sites on the Oroua River, including where the adjacent land is in Māori ownership (as shown in Map 38 above), and have again promised to develop a Memorandum of Understanding with Ngāti Kauwhata for extraction from the lower reaches. This has yet to eventuate.[602]

3.4.2 Case Study Eleven: Ōtaki River

The Ōtaki River is a significant inland waterway to Ngāti Raukawa ki te Tonga and the hapū of Ōtaki. The Ōtaki River also remains significant to Muaūpoko.[603] Its catchment drains over 400 square kilometres of the western slopes of the Tararua Ranges, and flows down through the foothills via deep valleys and gorges where it is joined at the Ōtaki Forks by three main tributaries, the Waitatapia, Waiotauru, and Waitewaewae streams, and then downstream by the Pukeātua Stream. After leaving the steep valleys, the river

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598 He Tini Awa Trust (Environmental Enhancement Trust), Report #: 02-210, 22 October 2002, Item # 8, p 61. Horizons Regional Council File EM1700. Provided by Jon Roygard, two emails 3 March 2017.

599 https://www.charities.govt.nz/

600 He Tini Awa Trust – Winding up of the Trust, Report #: 16-95, 31 May 2016, p 87. Provided by Jon Roygard, email 2 March 2017.

601 Personal communication, Dennis Emery, skype, 13 February 2017.

602 Interview with claimants from Ngāti Kauwhata at TROR, Levin, 8am, 6 September 2016, in Appendix V.

603 Personal communication, Emma Whiley of Bennion Law on behalf of Wai claimants Muaūpoko Tribal Authority, email received during the Draft Report feedback stage 20 June 2017.

meanders over a coastal flood plain.[604] On the flood plain it is joined by further tributaries in a triangular shape, notably, the Turangarahui, Te Awahohonu, Haruatai, Mangapouri, Kāingaraki, Maringiawai, and Waiariki streams.[605]

The Ōtaki River was surrounded by dense natural forest from the Tararua Ranges, along the flood plain, and to its headwaters.

> 'The Ōtaki [River] and its environs occupy an important place in Māori history. Pre-European settlement and in the immediate post-settlement period, politically strategic pa were always situated near the river.'[606]

The Ōtaki River was identified by Ngā Hapū o Ōtaki as being culturally significant for the following values: urupā, wai ora, wai tai, papa kāinga, mahinga kai, puna rāranga, puna rongoā, ara waka, tohu ahura, kauhoe, kaukau, ngā mahi parekareka i/ki te wai.[607]

The Ōtaki River and catchment is culturally significant to Ngāti Raukawa, also known as Ngāti Raukawa-ki-te-Tonga. The later name distinguishes from those of Ngāti Raukawa who stayed in the Waikato region. Ngāti Raukawa-ki-te-Tonga came to this region upon the invitation of Te Rauparaha, and in particular, through the influence of his elder sister and rangatira, Waitohi.[608] Led by prominent Ngāti Raukawa chiefs, a number of heke migrated south between the 1820s and the 1850s. The largest heke occurred in the 1820s and a number of hapū settled near the mouth of the Ōtaki River. The hapū shared a 'large complex of pa' on the land later surveyed as the Taumanuka Block. The hapū who hold mana whenua in the Ōtaki area, from the Kūkūtauākī Stream to the Pukehou Hill, are: Ngāti Huia ki Katihiku (south of Ōtaki River), Ngāti Maiotaki, Ngāti Pare, Ngāti Koroki, and Ngāti Kapu. Collectively they are referred to as Ngā Hapū o Ōtaki.[609]

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604 S. Borrer and G.A. Campbell, *Ōtaki River Gravel Analysis 1996-2001*, Greater Wellington Regional Council, Publication No. WRC/FPSA-G-01/60, 2006, in Khanam and Campbell, *Ōtaki River Gravel Analysis 2001-2006*, Wellington, 2006, p 1.

605 Adkin, p 207.

606 P Blackwood, *Ōtaki River Floodplain Management Plan Investigations, Phase One, Summary Report*, Wellington, 1992, p 3.

607 Greater Wellington Regional Council, 2015, p 292.

608 W Carkeek, *The Kāpiti Coast: Māori History and Place Names of the Paekākāriki-Ōtaki District* (Wellington: Reed Books, 1966), p 41.

609 Ngā Hapū o Ōtaki, *Proposed Ngāti Raukawa Ōtaki River and Catchment Iwi Management Plan*, Report for Te Rūnanga o Raukawa, 2000, pp 21-22. Permission for use by Rupene Waaka, Chairperson Ngā Hapū o Ōtaki, email 3 April 2017.

For Ngā Hapū o Ōtaki, Te Tiriti o Waitangi was the first collaborative management policy for the Ōtaki River.

> 'Under the terms of this agreement, the leaders of Ngāti Raukawa considered they granted the Crown the right to determine overall management legislation (in the public good). The Crown, on the other hand, guaranteed absolutely Ngāti Raukawa tino rangatiratanga in regard to the catchment. Ownership of the resource base was not considered to be threatened with the Crown making provision to act as an honest broker of any resource sales that Ngāti Raukawa might entertain.
>
> Whether the land deals that occurred in the decades following the signing were legitimate, fair or equitable is the subject of current debate…. What is indisputable is that Ngāti Raukawa do not consider that at any time we have surrendered either ownership or management right or responsibility over the catchment's resource base: its rivers, waters, atmosphere, fauna, flora and other resources, tangible and intangible, physical or metaphysical.'[610]

Developments since the signing of Te Tiriti o Waitangi, however, have seen the displacement of hapū management systems and its replacement by the Crown's 'much cruder system of control' who have denied the local hapū of Ōtaki their resources, and the benefits of that resource – including that of gravel from the river. For Ngā Hapū o Ōtaki:

> 'Ngāti Raukawa was happy to consider requests from the Crown to utilize the resources of the Ōtaki River. The request of the New Zealand Governor for gravel in 1866 is a clear example of this and one that epitomized Ngāti Raukawa desire to collaborate with the new immigrants to our land. Our elders considered the application and responded setting out the conditions by which the resource could be obtained. Ngāti Raukawa was to be compensated for the extraction and was to stay in control of the extraction process. Unfortunately, since that time our resource has been continuously obtained but our conditions of use have not necessarily been met.'[611]

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[610] Ibid, p 24.
[611] Ibid.

For example, in 1886, a group of kaumātua, including Matene Te Whiwhi, sent the following letter to Mr Featherston which clearly confirmed their authority over gravel resources. The kaumātua provided approval to access the river bed and extract gravel from their waterway, waiving a fee because the purpose of roading was also beneficial to their people. The letter also noted that Kiharoa was withholding gravel from the government until payment was made.

> *Ōtaki, May 21 1886*
>
> *To Mr Featherston*
>
> *Friend Featherston*
>
> *Salutations*
>
> *Your words concerning the road at Ōtaki have been related and the elder men of Ngāti Raukawa have agreed that the stones should be given up to improve the road of the Native.*
>
> *The cause of Kiharoa withholding stones is that the government pay money for the stones that is their thought concerning the stones besides the payment for the contractor the stones must be paid for.*
>
> *The Government will see the names of those who are against this, as they are sending you a letter to you that is Kiharoa and others. Our thought is we should consider the kindness of Mr Halcombe and the government that they have such work and we are grateful to you for the good works and they money that has come near to our thoughts is that the stones should be given up to the contractor and no payment, but the roadmakers that is our word.*
>
> *The end*
>
> *From the elder Runanga signed by 20 Kaumātua including Martin Te Whiwhi*[612]

Kereopa Tukumaru gave evidence during the Taumanuka Block hearing at the Ōtaki Native Land Court proceedings in 1896, stating that: "The pā that was occupied by Ngātihuia was destroyed by tides and abandoned."[613] This is likely to have been Pakakutu Pā which was known to be occupied by Ngāti Huia for a time before Ngāti Maiotaki. The Katihiku Pā site on the south side of the Ōtaki River mouth was another affected by flood waters. It is likely to be the pā referred in the following quote from the New Zealand Spectator news article in 1846:

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612 Cited in R Kerr, *Ko Ōtaki te Awa: Ōtaki River*, Ōtaki, 2012, p. 92.
613 Ōtaki Māori Land Court Minute Book 29, 25 July 1896, p. 294, cited in ibid, p 137.

> ‘About three months since the river in a freshet opened up for itself a new course, carrying awa one half of the pa. The natives we believe, intend building another one more inland, leaving the remains of the present pa for the use of those engaged in fishing the summer months.’[614]

The Ōtaki River was a well-known dangerous river in flood causing delays in coach crossings. Rod McDonald wrote that a spare coach was kept at Ōtaki in the case of flood events as the river was swift and unaffected by tide thus the coach could not be swum across like at other rivers.[615]

> ‘In flood time, therefore, the horses would be swum across, and the passengers and mail taken across by boat or canoe [probably waka]. There were times when even the horse could not be got across, and the coach would be held up for a day until the river subsided somewhat.’[616]

As Pākehā settlement increased in the Ōtaki floodplain between 1880 and 1930, large amounts of lowland forest clearance occurred with the cleared land quickly converted to farmland.[617] Most of this occurred between 1880 and 1900.[618] The photo below of the Ōtaki River, taken in 1928 from the Ōtaki gorge area facing towards the ocean, shows the meandering pattern of the river and its gravel/shingle river bed – and a substantially deforested flood plain.

[614] Ibid, p 137.
[615] RA McDonald and E O’Donnell, pp 32-33.
[616] Ibid.
[617] Blackwood, p. ii.
[618] Ngā Hapū o Ōtaki, p. 25.

Figure 24: **Ōtaki River photograph taken from the gorge by GL Adkin.**[619]

Floods were historically known to plague the developing Ōtaki township, sweeping through the area in 1906, 1920, 1925, 1926, and 1930, and with a number of particularly large flood events occurring in 1931.[620] The great flood in April 1931 which burst the river bank at Chrystalls Bend was reported in the Ōtaki Mail to be the "worst flood in living memory at Ōtaki".[621] The flood closed the Ōtaki Railway station and took out ballast from under the Railway Bridge. Local residents, market gardeners and farmers all experienced losses and flood damage. The next flood occurred in June that same year with three major floods in just eight days, and another in August after which massive stopbanks were erected at Chrystalls Bend to the river mouth.[622]

Further floods in 1936, 1940, and 1954 were not of the same size but sixty years on people were still talking about them. Caleb Royal noted that some of the earliest memories of kaumātua were of "Pakakutu being flooded in the 1830s and the pa being

619 Te Papa Photograph Collection. Ōtaki Gorge black and white negative. Ref. # B.020728.
620 R Kerr, 2001, p. 87.
621 Ōtaki Mail, 4 April 1931, in ibid.
622 Ibid, p 88.

shifted several times."[623] Rawhiti Higgott also discussed with Rex Kerr his memories of the flooding of his family home on the corner of Dunstan and Arthur Streets and them having to leave to stay with friends on the plateau.[624] Although flood control attempts had started as early as 1923 with the establishment of the Ōtaki River Board, they were largely ineffectual.[625] However, after these flood events, flood control measures began in earnest. In the 1940s the Manawatū Catchment Board fenced off the river to create a river control area.

> "The islands in the river were removed to allow the river to flow down the main channel unhindered. The keystone to the programme was Chrystalls Bend were the river was most likely to break through. The aim being to keep the river in a well-defined channel, contained by stopbanks, planting, groynes and the like from the gorge to the mouth."[626]

The measures were, however, destroyed in the next flood – such was the beginning of extensive flood control schemes on the Ōtaki River, including the extraction of gravel.

With the construction of the railway system in the inquiry district in the 1870s, land blocks were purchased from Māori owners and the demand for gravel began to increase. The Ōtaki River, with its gravel and shingle bed, was identified as a key source of supply. Gravel extraction for the developing rail and road transport infrastructure was one of the earliest industries in Ōtaki. Indeed, gravel from the banks of the Ōtaki River was used in the late 1880s as ballast for the railway tracks on the main trunk line in the southern region of the North Island.[627] In the 1940s, the New Zealand Railway gained a licence from the Manawatū Catchment Board to extract gravel.[628] The company opened the first ballast plant on the Ōtaki River in 1942 which continued to operate into the late 1960s before being demolished. Between these dates, aggregate was seen leaving the town most mornings. [629]

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623 C. Royal, in ibid, p 136.
624 Ibid, pp 88 & 89.
625 R Kerr, 2012, p 140.
626 Ibid.
627 Ibid, p 92.
628 Ibid.
629 R Kerr, *Ōtaki Railway: A Station and its People Since 1886* (Ōtaki: Ōtaki Railway Station Community Trust, 2001), p 66.

Gravel extraction from the Ōtaki River:

For the Ōtaki River, archival records were found which related to gravel extraction from the river between the years 1950 and 1989. The following pages are of summary analysis of those activities.[630]

From 1950, Manawatū Catchment Board records indicate interest in the establishment of a metal crushing plant on the Ōtaki River, and the need for the Board to acquire land on which to do so.[631] Mr Newnham, Chairman of the Soil Conservation and Rivers Control Council, in a letter dated 25 September 1950, to the chief engineer of the Manawatū Catchment Board, noted that a Mr Higgott had asked for sole rights to gravel from the Ōtaki Bridge to the sea, but that it would be undesirable to grant such a request and create a monopoly without allowing for public tenders and granting the right based on the highest royalty offered. Mr Newnham went on to say that:

> "land titles in this area are confused and have not been clarified by the Lands and Survey Department. There is native land, and occupied land, which has not been previously surveyed. Titles extend into the river bed".[632]

This issue of discrepancies over land titles surrounding the Ōtaki River was again referenced in letters from the Manawatū Catchment Board to various parties, but this was evidently rectified by May 1952 and plans had been approved and land acquired to progress the establishment of the stone crushing plant.[633]

In 1952, the Soil Conservation and Rivers Control Council notified the Manawatū Catchment Board of the Secretary for Marine being prepared to grant a license to Mudgway Carriers Ltd to take sand below the high water mark at the Ōtaki River mouth, provided that the excavation was by hand and the amount limited to 200 yards annually, subject to revocation if the beach changed adversely, with a royalty charge of 1/- per

630 This analysis was researched and written by Derrylea Hardy.
631 Various correspondence regarding Shingle Crushing Plant, Ōtaki. Feilding Central Archives, File HRC 00023:23/33E.
632 Manawatū Catchment Board correspondence regarding title discrepancies around the Ōtaki River. Feilding Central Archives, File HRC 00023:23/33E.
633 Ibid.

cubic yard.[634] This was agreed to by the Board who stated it would not affect river control work in the Ōtaki River. It appears that the Manawatū Catchment Board's "river control" purposes was the sole factor considered in granting a license to extract sand; any impact that this could have on tangata whenua values or customary take was not mentioned.

Also in 1952, the Board received a request from Mr Topp of Upper Hutt to establish a shingle crushing plant on the Ōtaki River.[635] The Board responded in 1953, indicating that until the Soil Conservation and Rivers Control Council had acquired land in the area, they could not grant such permission, and that it was experiencing difficulties with land titles in the area.[636] Mr. Topp wanted to establish a plant 200 yards downstream from the railway bridge, on the north side of the river, or at any other suitable site. The proposed plant would incorporate an overhead drag from the river, using a flying fox, with an estimated annual output of 20,000-22,000 cubic yards of shingle.[637] The Manawatū Catchment Board clarified that, as at 21 January 1953, the bed of the Ōtaki River was not all Crown land and that until title to it had been acquired, the Soil Conservation and Rivers Control Council had no power to grant any license for removal of gravel, but that when such title had been acquired, it would vest administration of the river bed in the Manawatū Catchment Board. Archival records indicate also that, in addition to gravel and metals, licences for access rights to the Ōtaki River for plastering sand were also received by the Manawatū Catchment Board in 1952.[638]

Throughout 1955, further correspondence passed between the Board and those interested in building the gravel crushing plant on the Ōtaki River. Of particular note was the issue of ownership of the land upon which the plant could be built. The interested parties noted in these letters were: Mr CW Topp of Upper Hutt, Gravel Products Ltd of Wellington, Mr GF Robinson of Lower Hutt, and Mr Higgott of Ōtaki Railway. In October 1955, the land adjoining the Ōtaki River between the road bridge and the sea was vested in the

634 Correspondence between the Manawatū Catchment Board and the Soil Conservation and Rivers Control Council re sand removal from Ōtaki River mouth. Feilding Central Archives, File HRC 00023:23/33E.

635 Mr Topp requested permission for a shingle plant on Ōtaki River. Feilding Central Archives, File HRC 00023:23/33E.

636 Manawatū Catchment Board letter to Mr Topp re a shingle plant on the Ōtaki River. Feilding Central Archives, File HRC 00023:23/33E.

637 Manawatū Catchment Board notes regarding a shingle plant on the Ōtaki River. Feilding Central Archives, File HRC 00023:23/33E.

638 Manawatū Catchment Board record, regarding request from GE Lee, Contractor, Levin for access rights to plastering sand, south bank, Ōtaki River. Feilding Central Archives, File HRC 00023:23/33E.

Manawatū Catchment Board, and they were then in a position to make arrangements with the applicants for the construction of the crushing plant on the river. The letter from Mr R Higgott, for example, acknowledged the fact that the Manawatū Catchment Board now 'owns the Ōtaki River'. This gave the Board the freedom to go about the licencing of operators to remove gravel and related materials from the Ōtaki River, in return for various fees and royalties which would be paid to them.[639] At that time, river metal was being removed from the bed of the Ōtaki River on a royalty for access basis (1/- per yard) plus a licence fee of 10/- per annum.[640]

To remove gravel and related materials from an inland waterway, access across the surrounding land to the river bed was required, for which the Manawatū Catchment Board charged an "access fee" – in addition to the royalty fee for a gravel extraction licence, charged per cubic yard of metal taken. In a letter dated 24 November 1955, from the Manawatū Catchment Board's chief engineer to the secretary of the Ōtaki Transport Company, regarding access to the Ōtaki River bed it was noted that the Ōtaki Transport Company was removing metal from the foreshore under licence from the Marine Department, with legal access through Lots 8 ad 9 D.P.15133 owned at present by Messrs Higgott and Webster.[641] The letter stated that,

> 'From the seaward boundary of Lots 8 and 9 the land to the mean high water mark was acquired by the Crown for soil conservation purposes and was vested in the Manawatū Catchment Board. The land comprised a small strip of old river bed being Part Ungranted Land (N.Z. Gazette 1954, page 1657) and Part Taumanuku 3 F M.L. 1507, G.T. 110/247, Coloured Blue on S.O. Plan 22211 being 5 cs. 3 r. 30 p. (N.Z. Gazette 1955, page 920).'[642]

The letter went on to state that Ōtaki Transport Company vehicles had been traversing access to the above areas in the removal of metal from below the Mean High water, and

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639 Letters regarding a shingle crushing plant, Ōtaki, to the Manawatū Catchment Board from R Higgott, 21 October 1955; and from the Manawatū Catchment Board to Messrs, Biss and Cooper, 10 October 1955; and Mr CW Topp, 10 October 1955. Feilding Central Archives, File HRC 00023:23/33E.

640 Report to Manawatū Catchment Board Chairman, 12 March 1956, and to Manawatū Catchment Board Members, 4 April 1956, regarding Shingle Removal from Ōtaki River. Feilding Central Archives, File HRC 00023:23/33E.

641 Letter dated 24 November 1955 from the Chief Engineer of the Manawatū Catchment Board to the Secretary of the Ōtaki Transport Company, regarding access to the Ōtaki River Bed. Feilding Central Archives, File HRC 00023:23/33E.

642 Ibid.

that the Board had therefore ruled that an access fee of one shilling (1/-) per cubic yard would be chargeable on all metal carted over the lands vested in the Board, payable on all metal carted on or after 1 December 1955.[643]

No written account in the Manawatū Catchment Board files or any other archives searched by this research team has found such access fee royalties being paid to tangata whenua by other parties who traversed their land to access inland waterways for commercial purposes such as to take gravel or other materials from inland waterways.

In a letter from the resident engineer of the Ministry of Works to the chief engineer of the Manawatū Catchment Board, dated 26 March 1956, it was stated that there had been concerns for some time about the removal of shingle and sand from the Ōtaki, Te Horo, and other beaches, and an enquiry had been received from the Marine Department about the possibility of 'obtaining supplies instead from the Ōtaki River, where land legalisation difficulties have been resolved', and also possibly from the Waikanae River. [644] Again, no mention is made of the ongoing customary rights of hapū and iwi to their waterways.

A Manawatū Catchment Board report in 1956 stated that the revenue from gravel extraction was small and difficult to collect, access to the river bed was difficult to supervise, and it was impossible to check on quantities. The report also stated that most of the metal removed was for building purposes and no crushed metal for roading purposes was available. The Report noted that the Railway Department was operating a crushing and screening plant to supply the Department's own requirements but no metal suitable for roading purposes was available, although some sales of metal were being made to private individuals. The purpose of the report was also to assist the Board in determining the possible demand for metal in the district, including from the National Roads Board in its construction of the proposed extension of the Wellington-Palmerston North motorway; and also the type of plant required to supply it. It noted that long haulage of metal added greatly to costs, and that north and south of the Ōtaki River were two shingle carrying

643 Ibid.

644 Letter from the Resident Engineer of the Ministry of Works to the Chief Engineer of the Manawatū Catchment Board, dated 26 March 1956, regarding the removal of shingle from the Ōtaki and Waikanae Rivers. Feilding Central Archives, File HRC 00023:23/33E.

rivers, the Ōhau and the Waikanae, the former with a plant already established and the latter with a plant capable of expansion.[645]

Subsequent meetings with the relevant parties determined there was sufficient demand by the National Roads Board to justify the establishment of a plant in Ōtaki, but that it would be dependent on the supply to the National Roads Board to meet its requirements. While it had been quoted as requiring 10,000 cubic yards per year, considerably more would be required during construction of the next section of the highway, particularly base course stone, and that one large ballast plant at Ōtaki (to extract that metal) was recommended. As noted above, the existing Railway Department plant in Ōtaki had been established in 1942 to produce ballast to meet the Department's requirements, since which time the Department had sold metal to interested parties such as the Ministry of Works, local bodies, and private contractors in and around the area. The main material sold was stated as being "by-products from the ballast production" consisting generally of sand, reject stone, and some crushed metal surplus to their requirements – and in 1955, sales of these by-products totalled around 12,000 cubic yards.[646]

In July 1956, the Manawatū Catchment Board gave a license to K Douglas Ltd for the installation of a Shingle Crushing Plant at the Ōtaki River.[647] In granting them a licence and access to the river site, the Board said it would not renew any other licence to remove shingle that might currently be in existence so long as K Douglas Ltd could meet all demand.[648] For this sole licence to operate, K Douglas Ltd paid the Board an advance sum of £100, representing the minimum royalty payable on any quantity up to 2000 cubic yards of metal.[649]

Due to a national growth in the construction industry in the 1960s, new gravel extraction plants were established by Douglas Metal (a division of Golden Bay Cement, known today as Winstone Aggregates) to design and create pre-stressed prefabricated reinforced building components. Three extraction plants existed at this time including one quarry at

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645 Report to the Manawatū Catchment Board Chairman, 12 March 1956, and to Manawatū Catchment Board Members, 4 April 1956, regarding shingle removal from the Ōtaki River. Feilding Central Archives, File HRC 00023:23/33E.

646 Ibid.

647 Letters between the Manawatū Catchment Board and K Douglas Ltd dated 6 July and 18 July 1956 regarding Ōtaki Shingle Crushing Plant. Feilding Central Archives, File HRC 00023:23/33E.

648 Executive Works Committee notes, Shingle Rights Ōtaki River. Feilding Central Archives, File HRC 00023:23/33E.

649 Ibid.

the mouth of the Ōtaki Gorge operated by the Horowhenua County Council. The largest extractor north of the railway bridge continued to be the New Zealand Railways ballast production plant. Together, this plant and those of K Douglas Ltd removed 1,000,000 cubic metres of gravel by the late 1980s-early 1990s.[650]

Indeed, over-extraction of gravel occurred during the period of 1952 to 1990 with an unsustainable extraction rate of approximately 5,000,000 cubic metres of gravel removed from a 6.6 kilometre stretch of the Ōtaki River. During this period, the Manawatū Catchment Board became concerned about the degradation of the river bed affecting their flood protection works as well as the stability of the twin bridges (rail and road). As a consequence, the Board negotiated a gradual reduction in annual extraction rates with the gravel companies and Horowhenua County Council. [651]

The Ōtaki Borough Council was concerned about the reduction in extraction rates and in 1983 they estimated that the loss of jobs would affect 400 local families. It was later estimated by the Greater Wellington Regional Council that, in 1983, the gravel extraction industry in Ōtaki was providing 140 jobs, consisting of 10 employed by the New Zealand Railway, 15-20 by Golden Bay Cement, with another 100 employees directly dependent on gravel production. The Winstone-Firth Group, which is still in operation today, brought out Golden Bay Cement and took over managing the New Zealand Railway ballast plant. In 1989, the Winstone-Firth Group negotiated 20,000 cubic metres at $2 per cubic metre for the period 1989-90 and then $3 per cubic metre for the period 1989-93.[652]

650 P Blackwood, 1992, p 3.
651 R. Kerr, 2012, p 94.
652 Greater Wellington Regional Council, Ōtaki River Floodplain Management Plan, 1994, Archive p. 15, in ibid.

Figure 25: **A recent aerial photo of Stresscrete manufacturer of concrete products.**[653]

Since 1989, flood protection and gravel extraction has been the responsibility of the Greater Wellington Regional Council (formerly known as Wellington Regional Council).

In 1994, the council completed the Chrystalls Bend realignment which continued to influence the mean bed level change in the reach. The channel realignment shortened the Ōtaki River by 150 metres, causing a readjustment of grade upstream along with a general lowering of the bed level. However, comparisons of 1996, 2001, and 2006 mean bed levels indicated that the levels were recovering and the effect was expected to be completely diminished by 2011.[654]

The Upper Rahui river realignment was completed in 1999 and involved retreating the right bank to achieve the planned channel alignment. For this realignment, gravel extraction and de-vegetation were used to retreat the river bank, and a total of

653 Photograph taken by Angela Ford, in ibid, p 151.
654 Khanam and Campbell, *Ōtaki River Gravel Analysis 2001-2006*, Wellington, 2006, p. 10.

approximately 107,000 cubic metres of gravel was extracted.[655] However, in general, the Ōtaki river alignment and banks did not meander far.[656]

In 2006, the Greater Wellington Regional Council produced a Ōtaki River Gravel Analysis Report to conduct a cross-section survey and gravel analysis of the Ōtaki River as well as recommend the extraction volume for the following 5 years.[657] The report stated that the annual extraction rate of 40,000 cubic metres per year be maintained with a one off additional extraction amount of 25,000 cubic metres to be taken from the area between Chrystalls Bend and State Highway One. The annual gravel extraction amounts for 1991-2006 were as follows:

- 1991 to 1996: approximately 240,000 cubic metres (48,000 cubic metre per year);
- 1996 to 2991: approximately 205,000 cubic metres (41,000 cubic metre per year);
- 2001 to 2006: approximately 195,000 cubic metres (39,000 cubic metre per year).[658]

Thus the total volume of gravel extracted over the period was approximately 640,000 cubic metres (42,000 cubic metres per year).

According to the regional plan, gravel surveys were taken every 5 years so this analysis compared results with cross section surveys taken in 1991, 1996, 2001 and 2006. The cross section survey is, according to the Greater Wellington Regional Council, the most appropriate method of determining the overall gravel balance within the system and thereby directing where extraction should be used as a method for river management.[659]

However, severe erosion had occurred over the ten years from 1991-2001, in the area of the south bank, known as Clifftops, with around 117,670 cubic metres of material eroding into the river.[660] The analysis in 2006 showed very little change in erosion since the last survey in 2001.[661]

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655 Borrer, 2002, in ibid, p 10.
656 Ibid, p 22
657 Ibid, p 15.
658 Ibid.
659 Ibid.
660 Borrer, 2002, in ibid, p 10.
661 Ibid, p. 22.

The Ōtaki river mouth tends to migrate south due to the prevailing littoral drift. Migration of the mouth too far south results in erosion of the left bank sand dunes and impacts on Māori land. North migration would impact on the current estuary configuration and compromise the lagoon and wetland habitat, as well as potentially threaten the northern stopbank. As per the council's Regional Coast Plan, if the mouth drifts more than 300 metres to the centre line of the river, it is realigned to more central position by the use of artificial cuts. In 2001, the council undertook as major mouth cut in the river accompanied by significant gravel extraction to realign the mouth to a central position.[662]

During recent hui, a number of participants from Ngāti Raukawa have raised issues about the impacts of such realignment work and associated gravel extraction on their lands by the Ōtaki River.

> 'We're losing a lot of land and that is due to extraction and the changing course of the Ōtaki River and that is quite a concern for us.'[663]

> 'In 1975, the river management people put in a new stopbank to stop the river tending to the north …. The river today in Ōtaki is channelled to flow the way it does being pushed by council to flow south and eat away at the Māori land on the Katihiku side…. They haven't given us any consideration into the discussions around these plans …. There hasn't been any consultation.'[664]

Nor has there been any compensation paid to Nga Hapū o Ōtaki for the gravel extracted – and nor for the loss of their lands.

Despite these actions undertaken by the council, and despite the extraction of 640,000 cubic metres of gravel from the Ōtaki River, the overall results from the 1991 to 2006 survey period showed a continued general trend of aggradation from the river mouth to Chrystalls Bend (section 501), and degradation above this point – as shown in Figure 26 below.

662 Ibid, pp. 10-11.
663 J Wilson, in Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Hui, Raukawa Marae, Ōtaki, Wai 2200, #4.1.9, 17-19 November 2014, p. 342.
664 TW Carkeek, in Poutama, Spinks, and Raumati, 2016, pp. 142-143.

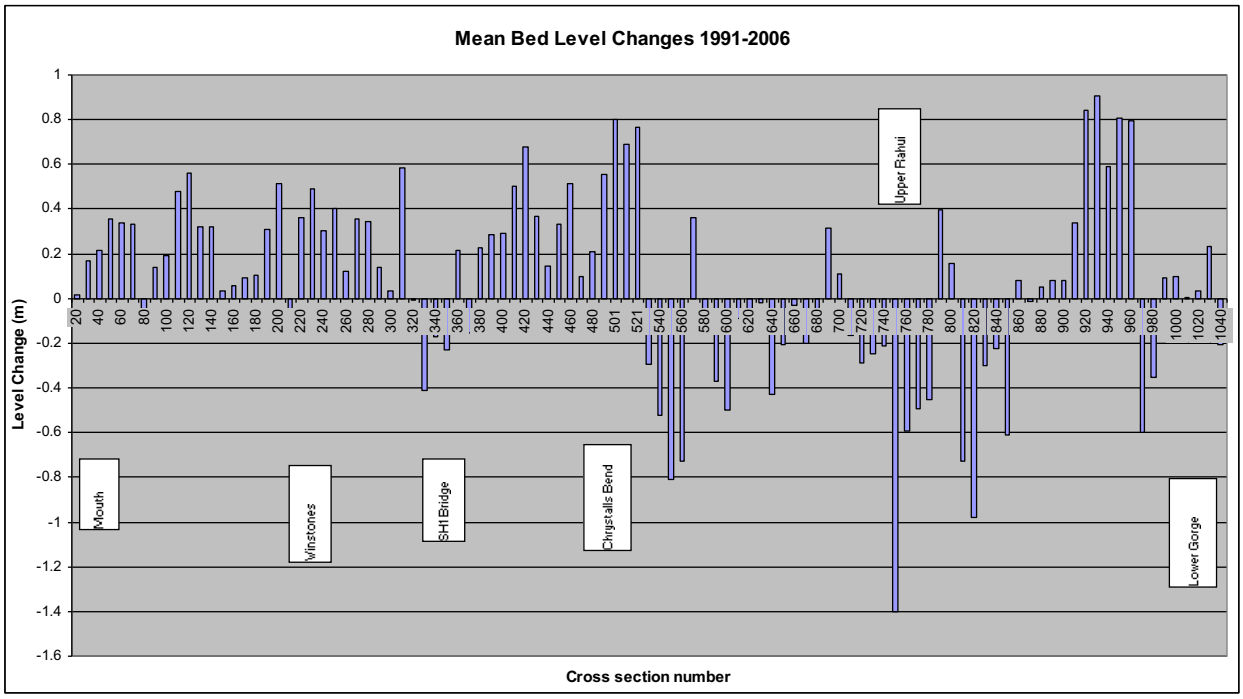

Figure 26: **Mean bed level changes 1991-2006.**[665]

Calculating the value of gravel extraction:

The Greater Wellington Regional Council does not receive royalty payments but instead issues each contractor with a license fee for the extraction of gravel from the district. The licence details the maximum volume of gravel that can be extracted and the charge which is subject to change based on an annual cost construction index adjustment. The licence fee contributes to ongoing management including: staff management costs to manage the extraction operations; departmental resource consent and ongoing compliance costs; five yearly river bed survey work; and the ongoing analysis of the geomorphology of the river. The current sustainable yield from the Ōtaki River is approximately 50,000 cubic metres per year, and the volume extracted in the 2015/16 year was 40,387 cubic metres. The user charge in 2017 is $1.27 per cubic metre.[666]

Given these figures, and making the assumption that the user charge in the 2015/16 year was the same as in 2017, it can be estimated that the Greater Wellington Regional Council received around $51,300 for the extraction of gravel from the Ōtaki River in the

665 Ibid, p 9.

666 Personal communication, Colin Munn, email 8 February 2017. Colin Munn is the current Team Leader, Flood Protection Operations, Greater Wellington Regional Council, Wellington.

2015/16 financial year. The iwi currently receives no royalty or compensation payments for the extraction of gravel from the Ōtaki River.[667]

Using the current sustainable yield figure of 50,000 cubic metres of gravel per year and multiplying this by the average price of Winstone Aggregates Ōtaki Quarry trade products as listed on their website which is currently $36.24 per cubic metre, [668] the industry value of the gravel taken is estimated to be $1.8 million/year. Using the above figure of 5 million cubic metres of gravel extracted from the Ōtaki River from 1965 to 1990, and multiplying that by the average price, the estimated value of the gravel extracted equates to $181 million dollars.

While this retail value does not equate to the much smaller value of the levies received by the Greater Wellington Regional Council (an estimated $51,300 in the 2015/16 financial year), it indicates the value that has been able to be accumulated by private interests as a result of extraction – and from which Ngāti Raukawa has been locked out of receiving any portion of.

Overview of flood control works on the Ōtaki River:

Between 1945 and 1955, the Public Works Department spent approximately $4.5million on flood control, erosion control, and realignment works on the Ōtaki River. From 1945 to 1992 the total cost of works on the Ōtaki River was estimated to be approximately $17.4 million; comprising of $1.5 million on stop banking, $2 million on drainage works, and $13.9 million on erosion and channel alignment works. A substantial proportion of these costs was funded by government grants from the Crown.[669]

In responding to these flood control works in 1992, Nga Hapū o Ōtaki stated that the actions of local authorities had progressively degraded the waterways of the floodplain that once formed their economic base, with some streams and springs no longer in existence. Since the signing of Te Tiriti o Waitangi they had been progressively marginalized and consistently excluded from the management of the Ōtaki floodplain, despite the guarantees of their ongoing tino rangatiratanga over such waterways – and had continued to be denied any substantial and effective input into council decision-making

667 TW Carkeek, in Poutama, Spinks, and Raumati, 2016, p 144.
668 http://winstoneaggregates.co.nz/uploads/2017/03/Ōtaki-Quarry.pdf Price effective as at 1 January 2017.
669 Blackwood, p ii.

processes. Instead, they were looking to the Crown to redress this grievance; where they would be recognised as the primary managers of their inland waterways and sites of significance including wāhi tapu and wāhi tūpuna, and not merely as stakeholders alongside others such as residents and floodplain river users.[670]

In the Ōtaki River Environmental Strategy report in 1999, the Wellington Regional Council acknowledged that 'many of the flood protection measures are not ideal from an environmental point of view' but saw them as essential to protecting the community from flooding.[671] Ngāti Raukawa and other members of the local community have continued to challenge the council's works on the Ōtaki River as 'unnecessary' and question its impacts on the river.[672] However, flood protection measures including gravel extraction and realignment of the Ōtaki River mouth continue today. The photograph in Figure 27 below, taken in March 2017, shows a grader redirecting channel flow at the Ōtaki River mouth. As summed up by Ngā Hapū o Ōtaki:

> 'The net result has been articulated elsewhere – the forests destroyed, the birds gone, the fish all but gone, the wetlands lost to pasture, the river system dismembered and stressed, the water from our aquifers-over allocated, even our stones strewn across the entirety of New Zealand.'[673]

670 Ibid, pp 81-86.
671 A Visser, Ōtaki River Environmental Strategy: Opportunities to Enhance the Ōtaki River Environment (Paraparaumu: Kapiti Coast District Council, 1999), p 14.
672 Kāpiti Coast District Council, *Greater Ōtaki Community Freshwater Vision*, Paraparaumu, 2006, p. 14.
673 Ngā Hapū o Ōtaki, p. 27.

Figure 27: **Ōtaki River mouth council changes continue.**[674]

3.5 Concluding Remarks

Large-scale deforestation and drainage of wetlands to create pasture lands for farming exacerbated flooding in the already flood-prone inquiry district. The removal of much of the district's wetlands through drainage schemes also removed or significantly reduced the food and other resources they contained which were highly valued by hapū and iwi, and which formed much of the basis of their economy. In response to exacerbated flood events, a number of flood control mechanisms have been and continue to be undertaken by local authorities on the rivers of the inquiry district – including further drainage schemes, and modifications such as stopbanks, floodway and sluice gate schemes, and the straightening of rivers.

The purpose of these river control mechanisms has been to protect townships or provide for their expansion and to protect commercially valuable farm lands from flooding, but have consistently failed to protect Māori customary rights and interests. Indeed, they have

[674] Photo taken by A Spinks, 28 March 2017.

been undertaken by local authorities without any involvement or consultation with hapū and iwi, and as a consequence, the flood control interventions have resulted in the further taking of Māori land and have caused further damage to the food stocks of waterways used by hapū and iwi and also to their sites of significance such as urupā.

Gravel extraction as a particular mechanism of flood control has again resulted in the further taking of Māori land, particularly as gravel became an important industry in the inquiry district. Local authorities have continued to extract gravel from many of the major rivers in the district – often without consultation with Māori as mana whenua and, in the main, without compensation to Māori landowners. Except in some instances in the late 1800s, it would appear the no hapū or iwi has derived any financial benefit from gravel extraction despite its development into a multi-million dollar private industry.

4. WATER USE

4.1 Introduction

The inland waterways of the inquiry district were and are vital to claimant hapū and iwi and their wellbeing. Use of these taonga tuku iho was a central feature of their economic, social, political, and spiritual life – with use governed and managed by kaitiakitanga principles and tikanga. The overarching aim or principle of kaitiakitanga was to maintain the mauri or life-affirming qualities of the waterways for the collective and future generations. Tikanga practices involved both the material and the spiritual: sustainable use of water resources, which included the disposal of used water to land and the siting of waste disposal areas and human latrines away from waterways; and through karakia and seeking and heeding guidance by spiritual guardian entities such as taniwha. These principles and practices ensured that freshwater resources remained in a healthy, useable state. Use was therefore enmeshed in a reciprocal, symbiotic framework of responsibility and care to maintain the vitality of both people and water.[675]

This chapter will provide an overview of hapū and iwi customary use of waterways in the inquiry district and contrast that with the use philosophy legislated for by the Crown and controlled and managed by its delegated local agents, where water has been used as commodity resource and a drain for waste in support of regional land-based industries for the economic advancement of particular groups. The chapter details how the Crown's regime for water use has consistently failed to uphold and protect the customary use of waterways by hapū and iwi in the inquiry district.

4.2 Customary Use of Waterways

In the main, customary use of inland waterways and the sustainable governance and management of such use by claimant hapū and iwi have become incrementally displaced since 1840. Instead, and in breach of Article Two of Te Tiriti o Waitangi, the Crown and local bodies in the inquiry district have assumed priority use rights and authoritative control of waterways – operationalised in part through successive land acquisitions from the 1880s and through numerous legislative, policy, and regulatory interventions.

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675 J Ruru, *The Legal Voice of Māori in Freshwater Governance: A Literature Review* (Wellington: Landcare Research Manaaki Whenua, 2009), pp. 18-19; Waitangi Tribunal, *The Stage 1 Report on the National Freshwater and Geothermal Resources Claim* (Wellington: Legislation Direct, 2012), pp. 35, 55-57, 76.

The *Inland Waterways – Cultural Perspectives Report*,[676] an accompanying piece to this historical report, details much about the past and present customary use of waterways drawn from interviews with claimant hapū and iwi.[677] This section is largely informed by that report. Also important in conveying customary use has been a further six claimant interviews that were unable to be included in the cultural perspectives report due to time constraints (see Appendix V). Material drawn from these six interviews, including direct quotes, have thus also been used to inform this section. A third source has been the transcripts of the three Waitangi Tribunal Ngā Kōrero Tuku Iho hui and also the site visit with the Waitangi Tribunal held in the inquiry district between June 2014 and April 2015.[678]

Collectively, these claimants spoke of the ongoing significance of their particular waterways to their sense of hapū and iwi identity and history; of their waterways as tūpuna, where their identity is inextricably tied together. However, they also spoke of the gradual erosion of much of their customary use practices as waterways became inaccessible (because of their location on or adjacent to privately-owned land), diminished and polluted and gradually unable to sustain stocks of aquatic species through Crown-authored regulatory regimes, or reduced or removed from the landscape altogether as a result of drainage schemes. As a consequence, their accounts of customary use are from both their own direct lived experience coupled with kōrero passed to them by previous generations.

As the very source of life itself, claimants talked of how all aspects of life necessarily centred around waterways.

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676 H Smith, *Porirua ki Manawatū Inland Waterways Cultural Perspectives Report* (Wellington: Crown Forestry Rental Trust, forthcoming).

677 M Poutama, A Spinks, and L Raumati, *Porirua ki Manawatū Inquiry: Collation of Oral Narratives for Inland Waterways – Cultural Perspectives Draft Report* (Wellington: Crown Forestry Rental Trust, 2016).

678 Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Site Visit From Tūkorehe Marae to Surrounding Areas, Wai 2200, #4.1.8(a), 23-24 June 2014; Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Hui, Tūkorehe Marae, Wai 2200, #4.1.8, 24-27 June 2014; Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Hui, Raukawa Marae, Ōtaki, Wai 2200, #4.1.9, 17-19 November 2014; and Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Hui, Whakarongotai Marae, Waikanae, Wai 2200, #4.1.10, 22 April 2015.

4.2.1 Customary Use of Waterways for Physical Wellbeing

Waterways were a key location for pā and papakāinga as they provided much of the necessities for physical sustenance. They were a source of fresh water for daily life, and were an immense source of kai ranging from a myriad of fish species and bird life to edible plants such as watercress. Tuna were especially important and were not just caught but deliberately cultivated through a range of technologies.[679]

> 'The importance of the dune lakes is the fact that they are pātaka kai; they are the places where we gather kai particularly because it was the number one food source of our ancestors. The reason why they are so important for our Raukawa people is that they were the sources of an abundant stock of tuna. The streams that run out of those lakes out to sea, they were and still are the primary source of whitebait. The other aspect of the dune lakes was that they provided a place for the gathering of wild fowl so you had every other species of birds of flight coming into those dune lakes. In recent times it's been duck shooting, but in the days of the heke through to the 1920s and through the Depression days, people were taking all kinds of birds and their eggs.' Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata.[680]

> 'The original name there is Kairanga because of the food and the water fowl and everything else … hence where the Kauwhata whare tūpuna stands today was called Kai Iwi Pa.' Steve Bray, Ngāti Kauwhata.[681]

Rivers and streams were also a key site of food storage and preservation, such as through the use of tuna boxes for the on-hand supply of live, fresh eels and the submerging of corn in fresh running waterways to produce kānga pirau or fermented corn, enabling seasonally-based food harvesting and planning. The trees and plant cover alongside and around waterways, and particularly in and around swamps and wetlands – such as raupō, harakeke, and pīngao – were a source of construction materials for housing and other buildings and for clothing, mats, woven wall panels, and so on. Waterways were also

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679 See also, GL Adkin, *Horowhenua: Its Māori Place Names and their Topographic and Historical Background* (Wellington: Department of Internal Affairs, 1948), pp 18-23.

680 Interview with Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata, at Archives, Wellington, 12 October 2016, in Appendix V.

681 Interview with claimants from Ngāti Kauwhata at Te Rūnanga o Raukawa, Levin, 8am, 6 September 2016, in Appendix V.

integral as a source of rongoā for the maintenance of hauora and for healing when ailing, both directly from sources of fresh water and from trees and plants with medicinal properties.

While claimants noted that they still maintain marae, with some also still maintaining whānau homes or homesteads by or close to their waterways, they talked with anger, frustration and sadness about the land alienations and the Crown-authored regulatory regimes that have resulted in the near wholesale destruction of their formerly pristine waterways severing much of their customary use and kaitiakitanga relationship with them. Claimant korero indicates that changes in the quality of waterways started to be noticeably apparent from the 1940s, but it is in more recent decades that the near wholesale breakdown of customary use has occurred.

> 'At the back of our place where our grandmother lived there were heaps of springs all along there and there were eels and watercress, fresh water crays and stuff like that ... and we used to go there and get them. It was a big suprise to go out there now and see it's all dry.' Sally Petley, Ngāti Wehiwehi.[682]
>
> 'We got a lot of kai out of there – watercress, kākahi, kōura.... We'd go out whitebaiting [up the Waikawa Stream] ... and we'd stay about an hour or two and catch enough for a feed and we'd go home. Now you go out there all day and hardly catch a feed. It's changed, you fluke a catch now.' Albert Gardiner, Ngāti Wehiwehi.[683]
>
> 'The closest waterway to us was just outside my grandmother's back door. It was called the Waimārama Stream – at that time a large, beautiful stream and it had īnanga, fresh water crayfish, and tuna…. My grandmother used to keep her kānga wai in the stream, which shows how pristine it was…. As a whānau we still retain the papakāinga with the Waimārama Stream not flowing as it used to, and not as pristine as it used to be. All the things we used to catch there, the īnanga, the kōura, the tuna, are no longer available to us.' Rob Kuiti, Ngāti Kikopiri.[684]

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682 Interview with claimants from Ngāti Wehi Wehi at Ngāti Wehi Wehi Marae, Manakau, 9 September 2016, in Appendix V.
683 Ibid.
684 Interview with Rob Kuiti, Ngāti Kikopiri, at Taaringaroa, Ōtaki, 25 May 2016, in Appendix V.

> ‘Pīngao was more abundant back then, at that time when I grew up…. I’m a weaver and it’s harder to get, it’s not as accessible…. And when I was little all you could see was flax, all harakeke out there as far as the eye could see, both sides. There’s not one there now…. They just took it out and turned it into farmland; drained it and turned it into farmland.’ Sandra Rangimahora Hemara, Ngāti Te Au.[685]

4.2.2 Customary Use of Waterways for Economic Wellbeing

Kai drawn from waterways were also important resources for trade both within and between local hapū and iwi, and so too were resources from wetlands and swamps such as harakeke. Indeed, the export of harakeke to Australia was a significant early enterprise for hapū and iwi who built and operated flaxmills, including Ngāti Raukawa in Ōtaki from which Mill Road is named.[686] Harakeke was also traded with Pākehā settlers in the inquiry district who also built flaxmills on the banks of rivers and streams for the processing of flax fibre.[687] The trading of kai resources with Pākehā settlers to supply the district’s growing townships was also significant – and extended to Wellington and over to the top of the South Island. Claimants also outlined how the inquiry district was a huge interconnected system of waterways that greatly facilitated trade, and trade relationships, through its use as a system of transportation of both goods and people via small and large waka – and which was also utilised in trading with settlers via boats. Some rivers, such as the Manawatū, were able to be navigated by small ships. Waterways were thus not only sites for living and resource gathering, but were also key sites of connection, interaction and economic activity.

> ‘The [Oroua] River is very important to Kauwhata in respect that it was our main highway when our people came here. They used the rivers as a main highway as well as a source of food.’ Rodney Graham, Ngāti Kauwhata.[688]

> ‘All the little significant streams had their own little river waka for eeling and travel…. At the back of the Awahou block, flax was taken off and getting flax at

685 Interview with claimants from Ngāti Te Au, Foxton, 5 June 2016, in Appendix V.
686 Letter from Tamihana Te Rauparaha to the Bishop of New Zealand, 21 January 1848. AUL/TPM 1, Box 1.
687 C Knight, *Ravaged Beauty: An Environmental History of the Manawatū* (Auckland: Dunmore Publishing, 2014), pp 147-160.
688 Interview with claimants from Ngāti Kauwhata at Te Rūnanga o Raukawa, Levin, 2pm, 6 September 2016, in Appendix V.

Foxton and here was one of the first trades going out … and the water fowls and eels were also good for the settlements.' Steve Bray, Ngāti Kauwhata.[689]

'The boats were coming up here to one of our settlements over here at Puketotara. Big schooners were travelling up the river to collect the goods off the people.' Donald Tait, Ngāti Kauwhata.[690]

'I remember both Mum and Arthur Hoterini (he was a whanaunga from Motuiti) talking about requests from Rātana for eels, or to let us know that they would be coming to eel. Koro and others from along the road would head on out there and catch them and have them ready for them when they arrived.' Ted Devonshire, Ngāti Te Au.[691]

Figure 28: **Water-wheel powered Flour mill on the Waitohu Stream, Ōtaki.**[692]

However, the successive transfer of land ownership and conversion of the inquiry district's waterscape to townships and pasture lands eroded and eventually ended the

689 Interview with claimants from Ngāti Kauwhata at Te Rūnanga o Raukawa, Levin, 8am, 6 September 2016, in Appendix V.
690 Ibid.
691 Interview with claimants from Ngāti Te Au, Foxton, 5 June 2016, in Appendix V.
692 A Dreaver, *Horowhenua County and its People: A Centennial History* (Levin: The Dunmore Press, 1984).

relationship between waterways as the source of the economic livelihood of hapū and iwi. These changes drove many of the claimants' parents and grandparents away from their homes to live in nearby towns and cities and instead participate in the capitalist economy instituted by the Crown. Many whānau, however, continued to rely on the kai resources of waterways to supplement their incomes from waged labour or to sustain their families when unemployed.

> 'There were a lot of people that relied on those waterways for food. There was seasonal work, freezing work, seasonal work for people shearing – they utilized the growing of kai at their homes… Eel were a necessity and the flax, and all the pūhā and watercress that was growing in and around those streams.' Donald Tait, Ngāti Kauwhata.[693]

This limited economic relationship with waterways as also been significantly eroded in recent decades as water quality has declined.

4.2.3 Customary Use of Waterways for Social Wellbeing

Daily routines of gathering and producing kai were necessarily collective; a daily practice of whanaungatanga and manaakitanga in that it also included the sharing out of kai with other whānau. Many claimants spoke of their own experiences of collective kai gathering – such as fishing or seasonal activities such as tuna heke and whitebaiting – activities which they described as enhancing a sense of community.

> 'You didn't just have the lone fisherman or group going out getting tuna or flounder or whatever species they wanted on the table at the marae. They went out as groups … so I think there's a lot to be told about whanaungatanga. I'm talking about going out in groups to harvest kai because that's the way most of our people operated around gathering kai for hui, tangi and other things like that.' Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata.[694]

> 'My job as a young fulla, once the tuna heke ran or they got eels … was to run to those aunties' and uncles' houses and give a portion of five or six tuna for them

[693] Interview with claimants from Ngāti Kauwhata at Te Rūnanga o Raukawa, Levin, 8am, 6 September 2016, in Appendix V.

[694] Interview with Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata, at Archives, Wellington, 12 October 2016, in Appendix V.

> until the next time the hīnaki was set. At that time the Waiwiri Stream was actually in a beautiful condition, absolutely beautiful condition and then all of a sudden things started to change because the farmers started to put drains in and then they diverted some of the waterways to those drains.' Rob Kuiti, Ngāti Kikopiri.[695]
>
> 'When I was a kid we'd go out whitebaiting for a feed ... you didn't whitebait all day. You got a feed and went past three or four houses and would drop some there and then they would recipocate when they went out.' Bobby Miratara, Ngāti Wehiwehi.[696]

Provision of these local delicacies to visiting manuhiri were also a key source of mana which enabled the extension of manaakitanga, and one which claimants said they still strive to uphold where access, water quality, and available fish stocks make it possible.

Alongside the gathering and production of kai, waterways drew whānau together as a place of recreation, fun, and the celebration of their ties to each other. Again, many claimants talked of their own past experiences of playing with cousins in their ancestral rivers and streams – catching tuna and kōura, swimming, and playing games – and one which they deeply lament is largely impossible for their own tamariki and mokopuna to experience for themselves.

> 'During the school holidays we used to spend a lot of time at the Oroua River where there were good swimming holes. You just used to go down to the river to get a kai, walk out to the river and gaff an eel and there was also plenty of trout – and when you moved into the small estuaries like the Mangoane Creek, there were a lot of kōura … [and] even freshwater mussels.' Edward Tautahi-Penetito, Ngāti Kauwhata.[697]
>
> 'In our time as children, some 50 years ago, the awa was everything to us. Just as my children and mokopuna look to the play station, we looked to the awa. We looked there for our food, our enjoyment. The river was everything. In the school

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695 Interview with Rob Kuiti, Ngāti Kikopiri, at Taaringaroa, Ōtaki, 25 May 2016, in Appendix V.

696 Interview with claimants from Ngāti Wehi Wehi at Ngāti Wehi Wehi Marae, Manakau, 9 September 2016, in Appendix V.

697 Interview with claimants from Ngāti Kauwhata at Te Rūnanga o Raukawa, Levin, 8am, 6 September 2016, in Appendix V.

holidays we would spend days down there and all we would take was a box of matches and a couple of spuds. We would light a fire, hunt all our kai, throw it on the fire and go back swimming. Those were the times that I know of the awa.' Rodney Graham, Ngāti Kauwhata.[698]

'I swam in that river and drank the water too. I'm 45 now so that's about 30 years ago. I don't take my kids anywhere near the river, no, nowhere to take them now… because it's polluted a lot now, there's all these signs saying you can't swim there up the river, down, and at Awahuri where we used to be all the time …. Even being able to show our children what it was like for us, their nannies and koros, they might not know that in their lifetime.' Serena Boyes, Ngāti Kauwhata.[699]

4.2.4 Customary Use of Waterways for Spiritual Wellbeing

Waterways were also central in maintaining spiritual health, wellbeing, and safety through their use in rituals, birthing and baptisms, tohi rites/purification, and for spiritual cleansing. Some claimants also spoke of waterways as wāhi tapu; with urupā being located in or adjacent to some waterways. Some noted that much of these practices have given way to Christianity, with others noting that lack of access and/or water degradation and pollution has severely curtailed or prevents their use for these practices.

'We had a place at the marae, it was called the tongue, and there they would wash the tūpāpaku and clean them before burial so that was a wāhi tapu, a sacred place which the river gave us. So spiritually, physically, and even psychologically, we could draw from the river. All the hours of playing down there must have done lots for our wellbeing psychologically…. The awa was a source of cleansing, so you would go down to the awa to cleanse yourself from that mamae or whatever was on top of you…. but the awa is so paru you don't want to get in it today. You got to travel 30 miles upstream, you got to jump in the car and travel.' Rodney Graham, Ngāti Kauwhata.[700]

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698 Interview with claimants from Ngāti Kauwhata at Te Rūnanga o Raukawa, Levin, 2pm, 6 September 2016, in Appendix V.

699 Ibid.

700 Ibid.

4.2.5 Customary Use of Waterways and Mana Wahine

Following on from the introductory chapter to the report and the leadership and knowledge of women in relation to waterways, many claimants talked about the roles of the women in their whānau in relation to mahinga kai. They had a central role, alongside men, in the gathering of food from rivers and streams and beaches, from fishing and whitebaiting and the gathering of kaimoana, to preserving food in their waters – and were considered experts in knowing when and where to go.

> 'It's the women that went fishing in the Ōtaki River, and if you asked all the families there they'd tell you about all the aunties whose job it was to go whitebaiting and they would go hauling flounder and everything else too…. Up there my kuia did the whitebaiting, but here the men and women did it together … it wasn't just a man's job or domain.' Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata.[701]

Claimants also spoke about the expertise of their mothers, grandmothers, and aunties in gathering harakeke from wetland areas and weaving.

> 'I can remember when Nanny and Andrea's grandmother, Whakaara Mahauariki, used to … go out to Himatangi beach. They would spend time picking pīngao and they would also gather pipi…. All Nanny's weaving materials were stored in the front veranda that had quite a range of fibres drying in different stages.' Ted Devonshire, Ngāti Raukawa, Ngāti Te Au.[702]

Some claimants, including Te Kenehi Teira, spoke at length of the ways in which the central role of Māori women as kaitiaki of waterways became usurped by the patriarchal worldview of the colonisers, marginalising their mātauranga and leadership in the historical record.[703] This marginalisation has disrupted the inter-generational transmission of these particular knowledges and the rangatiratanga status of Māori women.[704]

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701 Interview with Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata, at Archives, Wellington, 12 October 2016, in Appendix V.

702 Interview with claimants from Ngāti Te Au, Foxton, 5 June 2016, in Appendix V.

703 Interview with Te Kenehi Teira, Ngāti Takihiku, Ngāti Ngārongo, Ngāti Hinemata, Ngāti Tūkorehe, Ngāti Kauwhata, at Archives, Wellington, 12 October 2016, in Appendix V.

704 Mikaere, 2011.

4.2.6 Customary Use of Waterways – Political Independence and Connectedness

Claimants described the independence that their waterways provided to previous generations of their whānau and hapū; that they provided all that was needed to sustain themselves. The inquiry district's network of waterways not only served as natural boundaries between different hapū and iwi, but also connected the many pā and papakāinga dotted alongside and around them; they provided a means for neighbouring hapū and iwi to interact and share and trade with each other, and plan for their collective future development. Land alienations and Crown control of waterways have, however, disrupted much of this interdependence. [705]

> 'Ko Ruahine te maunga, ko Oroua te awa – which to me is very spiritually significant. When it rains, the rain falls upon the maunga, from the maunga it descends into the awa, and, as it travels down to where it meets with the Manawatū awa, it actually passes a whole multitude of places of significance to our people there. Kāinga, there were also quite a few marae along the river, Kai Iwi Pa, Kauwhata settlements all the way down; and of course their plantations, where that river flowed to the other side were very significant food baskets for our people, the swamps, and that food basket was really significant. We lost all those when the Pākehā came along. They were drained to accommodate cows and sheep.' Edward Tautahi-Penetito, Ngāti Kauwhata.[706]

The erosion of homes and connections and livelihoods have not been the only devastations incurred however. Some claimants also talked of the wider devastating impacts of the Crown's Treaty breaches, including on the large store of mātauranga associated with caring for waterways and their use as mahinga kai, its transmission to future generations, and necessarily on the tikanga practices and use of te reo Māori that give mātauranga expression and life.

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[705] See in particular the evidence of R Higgott and M Baker, Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Hui, Whakarongotai Marae, Waikanae, Wai 2200, #4.1.10, 22 April 2015, pp 154-158.

[706] Interview with claimants from Ngāti Kauwhata at Te Rūnanga o Raukawa, Levin, 8am, 6 September 2016, in Appendix V.

> ‘It’s a dying art. People wouldnt know how to catch them [eels], and cook them and eat them today.’ Bobby Miratana, Ngāti Wehi Wehi.[707]

4.3 Crown Recognition of Customary Use of Waterways

Crown recognition or acknowledgement of Māori customary use relationships and rights in the waterways of the inquiry district is almost entirely absent from the Crown’s official record. Fundamental changes were taking place in water use practices as Pākehā settlement expanded in the district from the 1850s – which were having an increasingly profound impact on hapū and iwi wellbeing. Despite this, searches of historical Crown records, council archival records, and past newspapers in relation to the particular waterways that are the focus of this chapter turned up empty when applied to Crown recognition of the customary use of waterways by iwi and hapū. Indeed, the only material found pertaining to hapū and iwi was when local government bodies sought to acquire Māori-owned land under the Public Works Act on which to erect their water works and sewage treatment plants.

This has changed somewhat in contemporary times, and particularly following passage of the Resource Management Act in 1991. While there has been recognition of the customary use rights of hapū and iwi by the Crown and its local bodies on the basis of their mana whenua, it has, in the main, been recognised as one use right alongside a number of other ‘competing’ use rights. As a consequence, customary use has not been accorded any particular respect. This is examined further in the following sections of this chapter.

4.4 Colonisation and the Change in Water Use Values and Practices

As outlined in the first part of this chapter, the customary use relationship between hapū and iwi and their ancestral rivers and waterways has been significantly eroded by colonisation. As land ownership transferred from Māori to the Crown and Pākehā settlers, so too did water use rights under the imposition of English common law principles relating to riparian land.[708] In particular, the Public Works Act 1876 authorised councils to take lands for the development of public works such as water-works. Crown passage of

[707] Interview with claimants from Ngāti Wehi Wehi at Ngāti Wehi Wehi Marae, Manakau, 9 September 2016, in Appendix V.

[708] J Ruru, *Property Rights and Māori: A Right to Own a River?* Unpublished paper prepared for the Foundation of Research, Science and Technology, 2011, p 16.

the Constitution Act 1852 and the Abolition of the Provinces Act 1876 also placed the control and management of waterways into the hands of its local government agents. Legislation such as the Highways and Watercourse Diversion Act 1858, River Boards Act 1884, Land Drainage Act 1893 and 1908, and the Swamp Drainage Act 1915 gave extensive powers to a range of local bodies to divert, stop-up, drain, or otherwise modify waterways that had significant and sometimes irreparable impacts on their customary use by hapū and iwi. Collectively, these laws, and ones later enacted such as the Town and Country Planning Act 1953, enabled local bodies to assume and determine priority use rights over waterways, and to take and control lands to ensure their plans for water use would come to fruition.

Much more than a transfer of land and powers took place, however. As already noted in previous chapters, colonisation heralded in a fundamentally different value system and understanding of the relationship between water and people, and of its use and management. Instead of a relationship of reciprocity, where use is enmeshed in a sustainable, kaitiakitanga framework of physical and spiritual care for the wellbeing of both, the Crown and local agents have, for the most part, understood water as a commodity resource to be used for the expansion of settlement and economic growth – and with little consideration of the consequences.[709] As such, waterways in the inquiry district and their freshwater resources were used to facilitate the settlement and development of townships – and to develop, expand or support the prosperity of the surrounding farmlands and industry upon which those townships relied for their economic wellbeing.[710] In contrast to the mutuality between mana wahine and mana tane in a Māori worldview, the determination of these endeavours was very much the domain of men. Waterways were also used as a 'cost-effective' and convenient means of disposing of the waste generated by these activities. Indeed, the perception and use of waterways as a site for unlimited waste removal was a dominant feature of the human-waterways relationship in industrialised England for most of the 20th century. This belief and practice was

[709] C Knight, *New Zealand's Rivers: An Environmental History* (Christchurch: Canterbury University Press, 2016).

[710] See for instance, A Dreaver, *Levin: The Making of a Town* (Levin: Horowhenua District Council, 2006); and MD Law, *From Bush and Swamp: The Centenary of Shannon 1887-1987* (Palmerston North: Dunmore Press, 1987).

transplanted here along with the British Crown, transforming the revered ancestral waterways of hapū and iwi into drains and sewers.[711]

Following the opening of the Wellington-Manawatū rail line in 1881, Pākehā settlement in the inquiry district increased and so too did the farming frontier and local industry enterprises. Councils began to develop water supply systems for their townspeople and local farms and industry, and sewerage systems to remove effluent. Palmerston North was the first town in the inquiry district to have a reticulated water supply scheme, with the Palmerston North Borough Council establishing a scheme from the Turitea Stream in 1889.[712] Others followed, including: the Levin water-race scheme opened in 1902 and the town's high-pressure scheme in 1910 – both supplied from the Ōhau River;[713] the Feilding town supply scheme from the Oroua River in 1906;[714] and the Ōtaki town supply scheme from the Waitohu Stream in 1922.[715]

Palmerston North was also the first town in the inquiry district to have a reticulated sewerage system. Despite protests from downstream communities such as Foxton, the Palmerston North Borough Council began piping raw sewage into the Manawatū River in 1890. Sewage treatment began in 1905 and has become increasingly advanced to meet more stringent water quality standards over time.[716] In a replay of history, the Palmerston North City Council continues to discharge sewage into the Manawatū River despite vociferous opposition from Rangitāne and Ngā Hapū o Kererū in Foxton,[717] and despite the fact that the treated sewage still places a significant burden on the river.[718] The Manawatū District Council also continues to discharge treated sewage from the Feilding wastewater treatment network into the Oroua River against the equally vociferous opposition of Ngāti Kauwhata.[719]

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711 C Knight, 2016, pp 68-73.
712 C Knight, 2014, p 233.
713 A Dreaver, 2006, pp 102-105.
714 'Feilding Borough Council', in *Feilding Star*, Volume XXVII, Issue 194, 16 March 1906.
715 Ōtaki Historical Society (Inc), *Historical Journal Volume 27* (Ōtaki: Ōtaki Historical Society, 2005), p 34.
716 C Knight, 2016, pp 71-73.
717 M Mulholland, 'The Death of the Manawatū River', in *Māori and the Environment: Kaitiaki*, edited by Rachael Selby, Pātaka Moore, and Malcolm Mulholland (Wellington: Huia Publishers, 2010).
718 C Knight, 2016, p 73.
719 See, for example, the interviews with claimants from Ngāti Kauwhata, in Appendix V.

As the population in the inquiry district has increased over the past century, so too has the demand for water resources from the district's waterways – and particularly as more land was drained and turned towards agricultural and horticultural production. Following passage of the Water and Soil Conservation Act 1967, water take and not just water discharge was able to be controlled by catchment boards, strengthening their ability to manage waterways.[720]

Managing waterways, however, did not mean managing them to maintain their mauri and support ongoing customary use by hapū and iwi for the gathering of food stocks, rongoā (both plant life and the water itself), or for spiritual cleansing practices. Instead, managing waterways allowed catchment boards to issue permits for the discharge of all manner of waste. As outlined by Queenie Rikihana Hyland, the 'creek' that ran by their family home (or Te Pare o Matangae, becoming the Mangapouri Stream closer to the Ōtaki township) became increasingly polluted from the 1950s onwards by the dumping of rubbish upstream, and the discharge of old milk from the local dairy factory. In her article aptly titled 'The day our beloved creek turned white', she described how the discharge killed off the tuna, īnanga, and fresh-water kōura in the creek, and made the water unusable for the preparation of kānga wai and for ritual cleansing practices. She also noted that the dairy factory later built a pipeline to discharge old milk into the Ōtaki River, turning it white also.[721]

Passage of the Resource Management Act 1991 further expanded the powers of local bodies to include regulation of the ways in which land was being used and its consequent effect on waterways. But driven by the ever-increasing pressure for economic growth and development, dairy farming intensified and market gardening expanded from the relatively small holdings characteristic of the 1950s to large-scale enterprises of the 1990s and onwards, driving up levels of water abstraction to unprecedented levels.[722]

In the Kāpiti Coast district, for example, water allocated through resource consents almost doubled in the twenty years from 1990 to 2010, with 47 per cent used for horticulture and

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720 C Knight, 2014, p 185.

721 Q Rikihana Hyland, 'The Day Our Beloved Creek Turned White', in *Ōtaki Historical Journal Volume 37* (Ōtaki: Ōtaki Historical Society, 2015), pp 14-17.

722 C Knight, 2014, pp 214, 235. Also see, *Historical Journal Volume 30* (Ōtaki: Ōtaki Historical Society, 2008), p 23.

cropping, and 31 per cent used for dairying. For 2010, the total volume of water allocated was 28.7 million cubic metres of which nearly a third was allocated from the Waikanae River. Sixty per cent was allocated from groundwater aquifers, and there are signs of dropping groundwater levels in the Waikanae and Hautere areas which may be related to abstraction.[723]

A myriad of concerns have been raised about the sustainability of high levels of water abstraction and its environmental impacts, including the reduced capacity of waterways to dilute the pollutants (including treated sewage, storm water, fertilisers and agricultural chemicals, animal effluent and farm run-off) that are discharged to it, especially during times of low water flow, the larger volumes of pollutant discharge that are a consequence of intensified land use, and the changed morphology and flow rates of waterways that have a negative effect on species of fish and other aquatic life.[724]

As farmers and local-business owners, and regulators and legislators went about building the blocks of a profitable farming and crop-based economy throughout the inquiry district, their destruction of waterways through drainage schemes and pollution similarly ravaged and destroyed the very basis of the Māori economy. Indeed, little to no attention was paid by the Crown and its local agents to the impacts of increasing abstraction and discharge on Māori customary use of waterways – and this has not substantially changed in more recent times.[725]

Nor have hapū and iwi, as a natural corollary of their mana whenua status, been accorded any central role in the determination of water use and discharge consent policies and processes used by councils - even in the face of increasing demands on their taonga waterways. This is despite the requirement of councils to recognise and provide for their relationship with their resources under Section 6 of the Resource Management Act 1991. Indeed, in terms of water use there was no robust system for measuring and monitoring actual use prior to 2010. According to the Ministry for the Environment, estimates made in 2006 suggested that only a third of the total volume of water allocated by resource

[723] Greater Wellington Regional Council, *Air, Land and Water in the Wellington Region – State and Trends: Kāpiti Coast Sub-region* (Wellington: Greater Wellington Regional Council, 2012).
[724] C Knight, 2016, p 223.
[725] M Mulholland, 2010, p 140.

consent was subject to active measurement by councils.[726] The Parliamentary Commissioner for the Environment called this uncontrolled use of water 'a tragedy'.[727]

The situation is also compounded by the fact that much of the water use via groundwater bores is not covered by resource consent and is thus not measured or monitored. While resource consents are required for new groundwater bores, there are a large number of bores in the inquiry district – many of which are quite old and do not have a resource consent. Bores used for households are generally not consented while bores used for irrigation (horticulture and farming) generally are. For example, in the Kāpiti Coast District Council area, there are an estimated 1222 bores of which nearly half are unconsented (583).[728]

The Ministry for the Environment commissioned a series of surveys on water allocation and estimates of actual water use of consented takes, the last of which was undertaken in 2010.[729] That survey found that the highest water take was for irrigation at 75 per cent, where water take for drinking (including reticulated municipal and community supply for commercial and industrial consumption) and for industry were 9 per cent each. Comparing the results with previous surveys, weekly water allocations had increased by a third in the last decade and the Horizons Regional Council had the highest percentage increase of 51 per cent. They also found that most regions were using less than half their consented water allocations – including those of the Greater Wellington Regional Council and Horizons Regional Council. On this basis, the report concluded that considerably more water use could be allocated in these regions and particularly from groundwater sources.[730]

These surveys contributed to the development of the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010, which has increased the

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726 http://www.mfe.govt.nz/fresh-water/regulations-measurement-and-reporting-water-takes.

727 Parliamentary Commissioner for the Environment, *Dairy Farming Impact on Water Quantity and Quality: Briefing to the Primary Production Committee* (Wellington: Parliamentary Commissioner for the Environment, 2007), p 2.

728 Greater Wellington Regional Council, *Resource Consents Wells and Bores*, http://data-gwrc.opendata.arcgis.com/datasets/2b9dc0a7d7d7492a99c3f9f7590b0b8c_1.

729 Aqualinc Research Limited, *Update of Water Allocation Data and Estimate of Actual Water Use of Consented Takes 2009-10: Prepared for the Ministry for the Environment* (Report No. H10002/3), (Wellington: Aqualinc Research Limited, 2010).

730 Ibid, p 36.

measurement of water allocation and use to 92 per cent.[731] While such measurement has arguably been a positive step, it is of significant concern that the context for doing so has been one of allocative 'efficiency' where 'under-utilised' water allocations are taken as signals by both the Crown and councils that there is more 'headroom' within which to consent to the further expansion of horticulture and intensification of farming.[732] This efficiency approach is central to the Crown's new Freshwater Allocation Work Programme, developed following the *Next Steps for Fresh Water* public consultation document released in February 2016.[733] The "primary objective" of the work programme is to "maximise economic benefits", where water allocations (both water take and discharge) catchment-by-catchment are centre around making a positive contribution to regional economic development.[734]

While roles for iwi in relation to the care, protection, use, access, and allocation of fresh water resources may be considered by the Crown as part of Stage Two of the Waitangi Tribunal National Freshwater and Geothermal Resources Inquiry (Wai 2358), the Crown has already established economic development as the priority for freshwater management which remains oppositional to a sustainable, kaitiakitanga approach. The Crown has also indicated they may instead seek to settle Māori rights and interests in fresh water using a monetary mechanism which would surely further sever the relationship between hapū and iwi and their taonga waterways.[735]

The process of colonisation in the inquiry district, as with elsewhere in Aotearoa, has worked to marginalise hapū and iwi customary use relationships with their waterways. Such recognition remains significantly limited in current council processes and practices to date, where few campaigns by hapū and iwi to protect customary use of their waterways have been successful. Instead, since their formation in the early colonial period, councils have continued to direct the use of water resources in service of their

731 http://www.mfe.govt.nz/fresh-water/regulations-measurement-and-reporting-water-takes.
732 C Knight, 2016, pp 239-240.
733 Ministry for the Environment, *Next Steps for Fresh Water: Consultation Document* (Wellington: Ministry for the Environment, 2016). Forty submissions were received from iwi and Māori rōpū, in Ministry for the Environment, *Next Steps for Fresh Water: Summary of Submissions* (Wellington: Ministry for the Environment, 2016), p 4.
734 Cabinet Paper to Economic Growth and Infrastructure Committee on Fresh Water: Allocation Work Programme, 13 May 2016, pp 1, 4. http://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/Freshwater%20Allocation%20Work%20Programme%20%20Terms%20of%20Reference%20and%20Appointmen....pdf.
735 Ibid, p 3.

own interests and particularly to that of regional economic growth, authorised by Crown laws and policies. These points are examined further in a number of case studies which form the remainder of this chapter.

4.5 Case Study Twelve: Water Use and the Ōhau River

The Ōhau is significant to Muaūpoko,[736] as well as being the largest significant river of Ngāti Tūkorehe, Ngāti Kikopiri, and Ngāti Hikitanga (also known as Ngāti Hikitanga Te Paea)[737] – iwi and hapū of Ngāti Raukawa ki te Tonga who are linked by the river and the network of smaller streams which run into it as it flows to the coast: Kuku, Waikōkopu, Tikorangi, Manganaonao.

In her interview for the *Inland Waterways Cultural Perspectives Technical Report*, Yvonne Wehipeihana-Wilson talked of the multiple iwi interests in the Ōhau River:

> 'Having been told by my elders that Kikopiri, Tūkorehe and Muaūpoko, are the kaitiaki of the Ōhau River, one has to wonder what is happening and who is benefitting from the Ōhau River. This is an issue where Kikopiri, Tūkorehe and Muaūpoko will work together to find the answers to these questions. We will care for Te Awa iti o Haunui-a-Nanaia (Ōhau River).' Yvonne Wehipeihana-Wilson, Ngāti Tūkorehe.[738]

The Ōhau River was a site of pā, papakāinga, and thriving mahinga kai and was particularly famed for its plentiful supply of whitebait.[739]

> 'The Ōhau River for us as a whānau was a recreational area. There were three areas where we went to swim … At the beach end of the Ōhau was the area for whitebaiting.' Rob Kuiti, Ngāti Kikopiri.[740]

> 'When you disturb … trees and so forth, you get silt washing down from the Tararua and the slips also enter our waterways. It was controlled before by the

[736] Personal communication, Emma Whiley of Bennion Law on behalf of Wai claimants Muaūpoko Tribal Authority, email received during the Draft Report feedback stage 20 June 2017.
[737] Also known as Ngāti Hikitanga Te Paea. Personal communication, Margaret Morgan Allen, Claimant of Wai 977, Ngāti Hikitanga Te Paea, email received during Draft Report feedback stage 14 May 2017.
[738] Ngāti Tūkorehe whānau Inland Waterways Cultural Perspectives Wānanga and Interview, held at Tūkorehe Marae, Kuku, 12 June 2016.
[739] Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Nga Korero Tuku Iho Hui, Tūkorehe Marae, Wai 2200, #4.1.8, 24-27 June 2014.
[740] Interview with Rob Kuiti, Ngāti Kikopiri, at Taaringaroa, Ōtaki, 25 May 2016.

rākau growing on there, but when the rākau are removed then of course it's open slather….and it works its way all the way to the Ōhau awa.' Pat Seymour, Ngāti Tūkorehe.[741]

Ironically, this silt in the Ōhau River from large-scale deforestation in its catchment would become an ongoing headache in the maintenance of the water supply schemes developed from it in the early 1900s.

4.5.1 Water Supply Schemes from the Ōhau River

On the 5th of February 1902, the first water supply system in the Horowhenua County Council district was opened by Premier Richard Seddon: a water race system of man-made channels in Levin's town streets from which water could be drawn, and which extended out to surrounding farms. Supplied from an intake or head in the Ōhau River five miles above Levin, around 4,000 gallons of water per minute flowed into 50 miles of channels that covered an area of 10,000 acres supplying 500 town and farm properties. The water race system emptied into Lake Horowhenua via 13 outlets. During the opening ceremony, the Premier said the water-races would make the district one of the most prosperous localities in the country. Indeed, local farmers reported a 20 per cent increase in milk production within months of being connected.[742]

Under the Water-supply Act 1891, the Horowhenua County Council was authorised to constitute itself as a water-race district, construct a water race system, and supply water to local boroughs. A search of Horowhenua County Council archives was undertaken and no evidence of council engagement with Ngāti Tūkorehe, Ngāti Kikopiri, or Ngāti Hikitanga/ Ngāti Hikitanga Te Paea was found in relation to the water take from the Ōhau River for the water race system, its construction, or its emptying into Lake Horowhenua. There was also no evidence that the council gave consideration to the impacts the water race system might have on customary use of the Ōhau River by Ngāti Tūkorehe, Ngāti Kikopiri, and Ngāti Hikitanga/Ngāti Hikitanga Te Paea or of Lake Horowhenua and the Hōkio Stream by Muaūpoko and Ngāti Pareraukawa – or were aware of or considered the breach of tikanga being made by discharging one water body into another, compromising the mauri of both. As such, and in breach of the Treaty guarantees of tino rangatiratanga

741 M Poutama, A Spinks, and L Raumati, p 185.
742 A Dreaver, 2006, pp 73, 102-105; and 'Levin Water Race', in *Manawatū Standard*, volume XL, Issue 7215, 6 February 1902,

of hapū over their taonga waterway resources, this significant development in water supply and use seemingly happened without any form of involvement with those holding mana whenua. While invisible in the council record, Anthony Dreaver, in his history of the Horowhenua, noted that Muaūpoko expressed grave concerns the water races would pollute their lake.[743]

Archival evidence shows the Crown had an active role in the establishment and development of the Levin water-race scheme. This included correspondence between the Chief Surveyor and the Surveyor General via letter dated 25 March 1902,[744] which included a picture of the proposed scheme.[745] Horowhenua County Council records revealed the amounts received by Parliament for the scheme,[746] and an agreement for government finance by the Lands and Survey Department was signed off by the Minister of Lands and witnessed by the Chairman of the Horowhenua County Council. This agreement stated that:

> 'under provisions of Section 12 of 'The Appropriation Act, 1900' outlining provisions in the Act for sums of money "appropriated by Parliament for SETTLEMENT ROADS, BRIDGES AND OTHER PUBLIC WORKS, out of which the Minister hath proposed to pay £250:0:0 to the local body for the construction of the Levin-Wereroa Special Water Race to A/C.' [747]

An additional £758 was voted to be paid towards the scheme.[748]

While on the one hand the Levin Water Race Committee was fielding requests from those wanting the water races deviated through their properties, they were also fielding a host of complaints about the water races from townspeople including pollution from animal use, overflow from septic tanks, and the dumping of rubbish into them.[749] Separating

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[743] AJ Dreaver, 1984, p 209.

[744] Letter from the Chief Surveyer to the Surveyor General regarding the Levin Water Race, 25 March 1902. Archives New Zealand, Wellington, R24007373, Horowhenua No. 6 Block, LS-W1 380, Record 19345/4.

[745] Picture of the proposed Levin Water Race. Archives New Zealand, Wellington, R24007373 Horowhenua No. 6 Block, LS-W1 380, Record 19345/4.

[746] Records of the Horowhenua County Council outlining the amounts paid by Parliament. Archives New Zealand, Wellington, R24007373, Horowhenua No. 6 Block, LS-W1 380, Record 19345/4.

[747] Agreement by the Lands and Survey Department, signed off by the Minister of Lands, witnessed by the Chairman of the Horowhenua County Council. Archives New Zealand, Wellington, R24007373, LS-W1 380, Record 19345/4, Horowhenua No. 6 Block.

[748] Ibid.

[749] Minute book for the Levin Water Race Committee, 1904-1906. Archives Central, HDC 00162:1:1.

from the Horowhenua County Council in 1906, the newly formed Levin Borough Council had both the autonomy and the finances to plan for the development of the town's public amenities, including an alternative to the problematic water race system. Urged on by the District Health Officer, the council began to consider provision of a high-pressure water system for the Levin township, this time from further up the Ōhau River where the land was still, in part, Māori owned.[750] A necessary early step was thus to "acquire native land in the neighbourhood with a view to preserving an undisturbed and unpolluted watershed from which the future water supply of the town can be obtained."[751]

In early 1908, the borough engineer assured the council about the ampleness of the water supply from the Ōhau River,[752] and a report to the Minister of Public Works gave assurances that there was a plentiful water supply 'for all time'.[753] Thus in early 1908, a council committee began buying up land for the water supply's headworks, pipeline, and catchment area.[754] Figure 29 below, shows the pipe-bridge on the Ōhau River in the course of its construction.

The high-pressure water supply system was officially opened in June 1910. In addition to supplying water to Levin's homes, businesses, and nearby farms, the water system was also used by enterprising business owners and farmers as a source of power for machinery.[755]

[750] A Dreaver, 2006, pp 59, 102.
[751] Levin Borough Council minutes, 1 October 1906, in ibid, p 102.
[752] Untitled, in *Manawatū Times*, Volume LXV, Issue 338, 10 February 1908,
[753] 'Water Supply for Foxton', in *Manawatū Herald*, Volume XXXII, Issue 845, 28 May 1910.
[754] A Dreaver, 2006, p 103.
[755] A Dreaver, 2006, pp 104-105.

Figure 29: **Ōhau River pipe-bridge in the course of construction.**[756]

Over the ensuing years, further extensions were made to the water supply scheme to connect up more properties and farms within the Borough – and the adjoining Horowhenua County, where existing supply was, in effect, 'at the pleasure of the [Levin Borough] Council.'[757] An addendum to a report of the Town Clerk to the Levin Borough Council in 1947 lists special consumers connected to the municipal water supply, and includes schools, post offices, industries, and factories. No marae appear on the list.[758] Water supply, and its extension to the wider Horowhenua County, continued to be dominated by economic interests framed in a logic of equal opportunity that denied the interests of those holding mana whenua over the waterways:

> 'Levin Borough has control of the only reliable source of high pressure water supply in the district, but, as the prosperity of the town is linked up with that of the surrounding district, it appears to be only fair and reasonable that those

[756] Photograph taken by GL Adkin and supplied to the Levin Borough Council. Sourced from Archives Central, HDC 00065:1.

[757] 'Municipal Waterworks', report to the Levin Borough Council from the Town Clerk, 28 January 1947, p 4. Archives Central, HDC 00010:16:35/10.

[758] Ibid.

benefits should be shared all round. It is a great gift provided by nature and should not be the monopoly of any one section of the people.'[759]

In 1927, following nearly 20 years of discussions between councils, a tentative agreement between the Levin Borough Council and the Horowhenua County Council was made to supply water to the township of Ōhau and rural areas still served by the Horowhenua water races.[760] A further near two decades later, this was still being considered. In March 1954, a Joint Water Supply Committee comprising equal membership of the Levin Borough Council and the Horowhenua County Council, with their respective clerks and engineers, was established to discuss the question of supply to the wider county.[761] Following an engineers' report completed in late 1958,[762] the councils released a joint statement of their findings – namely that the Ōhau River could supply 8,200,000 gallons of water per day, which would easily cover current estimated consumption (1,500,000 gallons per day) and the anticipated needs 25 years into the future (3,200,000 gallons), leaving a surplus for supply to adjacent county areas.[763] A subsequent letter from the engineers noted that the Levin Borough Council had no actual records on water consumption.[764] Neither the engineers' report nor the councils' joint statement referred to or gave consideration to the impacts on Māori customary use of the Ōhau River, or made mention of engagement with Ngāti Tūkorehe, Ngāti Kikopiri, or Ngāti Hikitanga/Ngāti Hikitanga Te Paea in their investigation and subsequent deliberations. Following a report on costs of the scheme in October 1959,[765] the councils agreed to the scheme,[766] although

[759] Ibid, p 3.
[760] 'Tentative Agreement with Horowhenua County', undated. Archives Central HDC 00010:15:35/4.
[761] Letter from the Town Clerk of the Levin Borough Council to the County Clerk of the Horowhenua County Council, 4 March 1954. Archives Central, HDC 00010:16:35/10.
[762] Ōhau Catchment and Future Requirements, Spencer Hollings & Ferner, undated. Archives Central, HDC 00010:16:35/28.
[763] 'Joint Statement by His Worship the Mayor of Levin and the Chairman of the Horowhenua County Regarding Improvements to and the Enlargement of the Levin Borough High Pressure Water Supply and its Extension to Areas of the County Adjacent to Levin', undated. Archives Central, HDC 00010:16:35/28.
[764] Letter from Spencer Hollings & Ferner to the Levin Borough Council, 28 November 1958. Archives Central, HDC 00010:16:35/28.
[765] 'Report on the Extension and Improvement of the High Pressure Water Supply in the Horowhenua County' from Spencer Hollings & Ferner to the Chairman of the Horowhenua County Council, 7 October 1959. Archives Central, A/2012/3: 14.
[766] See letter from the Special Waterworks Committee to the Levin Borough Council, November 1959, and letter from the Town Clerk of the Levin Borough Council to Spencer, Hollings & Ferner, 1 December 1959. Archives Central, HDC 00010:16:35/28.

there were further lengthy delays due to objections from ratepayers on the cost of the scheme.[767]

Again, archival searches of council records on water supply issues of this period, and indeed from 1910 to 1989, found no evidence of any engagement or negotiation between councils and Ngāti Tūkorehe, Ngāti Kikopiri, or Ngāti Hikitanga/Ngāti Hikitanga Te Paea in the development of and extensions to water supply from the Ōhau River, aside from the acquisition of Māori land in 1908 to secure the council's water use rights. It appears that no consideration was given to maintaining or safeguarding customary use of the Ōhau River by Ngāti Tūkorehe, Ngāti Kikopiri, and Ngāti Hikitanga/Ngāti Hikitanga Te Paea even in the face of greatly increased demand for and abstraction of water, or of their rights to play a central role in debating and determining water supply issues. Instead, councils assumed full authority to decide on the use of water resources, tempered by ratepayer agreement, and immersed themselves in the issues of concern to them. As the archival records show, the main issues of concern to councils were the cost of water supply and water rates charges, which council should be liable for the costs of connections and maintenance,[768] and that the prosperity of the district was dependent on water being supplied to as many properties as possible.[769]

Another issue of significance has been that of water wastage. In contrast to the tikanga of sustainable water use that is part of Māori customary use practices, there has been considerable water wastage through leakage in the municipal supply system drawn from the Ōhau River. A council report of August 1988 estimated wastage at 5000 cubic metres per day which translated to a staggering 45 per cent of the average daily demand. The argument advanced for addressing the waste was singularly an economic one: the monetary cost saving to council of the wasted water and the elimination of the need to invest in further capital works to supply the increased water demand from leakage.[770] The value of water as valuable in itself; as a finite resource deserving of care and respect was not mentioned.

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767 Report from the County Clerk to the Chairman of the Horowhenua County Council, 19 October 1966. Archives Central, HDC 00018:36:9/11/1.

768 Ibid.

769 'Report Received on $1 Million Improvement to Water Supply', in *The Chronicle*, 21 October, 1987.

770 Report from the Borough Engineer to the Chairman and Members of the Works Committee, 4 August 1988, pp 1-3, 6-7. Archives Central, HDC 00009:152:29/9.

The issue of waste has again been a significant issue with Horizons Regional Council declining a resource consent request by the Horowhenua District Council for additional water allocation to cover an estimated 21 per cent waste from leakage. The maximum level of wastage provided for in the One Plan is 15 per cent and Horizons specified they wanted it brought down to this level within 20 years, and to 18 per cent within 10 years. The Horowhenua District Council appealed the decision with the Environment Court on the basis that the decision would compromise the community's social, economic and cultural wellbeing, and health and safety.[771]

4.5.2 Irrigation from the Ōhau River for Farming, Horticulture and Industry

The development of the Levin water race scheme in 1902 increasingly supplied farmers and market-gardeners both within the Levin Borough Council area and in the wider Horowhenua County as it was expanded to connect up more properties. The municipal high-pressure water supply scheme was similarly expanded over time to connect up more farms and market-garden properties, as outlined above. Newspaper reports of the time pointed to the importance of farming and crops such as fruit and potatoes to the growing prosperity of the region,[772] and the importance of the water supply schemes to their productivity. Indeed, dairy farms connected to the municipal water supply scheme were reported to have milk yields that were doing 'astonishingly well'.[773] By 1938, water supply for dairying had "extended on every side".[774]

In the early 1900s, Levin was considered the hub of a rural economy enjoying the best prices ever known for its major produce, including timber, flax, and above all, dairy produce. The Levin Cooperative Dairy Company had opened in 1899, and a number of other significant industries also began to develop in the following decades, including poultry farming and a municipal abattoir in 1929.[775] All drew their water from the town supply. By 1945, the Levin Cooperative Dairy Company had 435 suppliers.[776]

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771 N McBride, 'Horowhenua Council Appeal Horizons Decision into Levin Water Supply', in *Manawatū Standard*, 2 December 2015.

772 See for instance, 'Local and General', in *Horowhenua Chronicle*, 27 January 1911; and 'The Levin Chronicle', in *Horowhenua Chronicle*, 14 February 1920.

773 'Local and General', in *Horowhenua Chronicle*, 17 March 1911.

774 'Municipal Administration Reviewed', in *Horowhenua Chronicle*, 5 May 1938.

775 A Dreaver, 2006, pp 58-60, 85

776 AJ Dreaver, 1984, p 233.

As with the previous section, archival searches of council records on water supply to farms and industry over this period and extending to 1989, found no evidence of council engagement with Ngāti Tūkorehe, Ngāti Kikopiri, or Ngāti Hikitanga/Ngāti Hikitanga Te Paea regarding the supply of water from the Ōhau River. Nor was any evidence found of council consideration of the impacts of ever-increasing water take on their customary use of the Ōhau River.

Environmental impacts were being raised in some quarters, however. The 1934 Annual Report of the Acclimatisation Society urged protection of New Zealand's lakes and rivers, and stated that 'in the Wellington District there is undoubtedly evidence of pollution, particularly in connection with the dairy industry'.[777] While the Crown had set up a Royal Commission on Dairying that same year, the sole focus of that investigation was on trade and marketing, with no mention of the need to consider the regulation of both discharges to waterways and of water take.[778]

An economic focus was to also dominate the development of government-funded irrigation schemes and policy programme, although no such schemes were developed utilising the Ōhau River nor any of the waterways in the inquiry district – being instead mostly developed in the Canterbury and North Otago districts.[779] The Crown did, however, invest in Māori farming and market gardening schemes in the inquiry district from the 1930s via their Native Department (and later their Māori Affairs Department), but these too were dominated by economic interests.[780] In the Ōhau and Ōtaki districts in particular, a number of market gardening schemes for Māori landowners were developed in the 1930s and 1940s. The idea was that such enterprise would turn Māori into 'industrious settlers',[781] and turn 'waste' land to a productive purpose for the benefit of the national economy. The schemes provided funds in the form of loans for equipment, fertiliser, and seeds. While they generated good results for those involved, they ended in

[777] 'Local and General', in *Horowhenua Chronicle*, 29 May 1934.
[778] Royal Commission on Dairying, *Report of the Royal Commission on Dairying* (Wellington: Royal Commission on Dairying, 1934).
[779] National Water & Soil Conservation Organisation, *Irrigation in New Zealand – A Review of Policy: Report of a Working Committee of the Water Allocation Council* (Wellington: National Water & Soil Conservation Organisation, 1971). Archives New Zealand, R203945, ABMH W4305 Box 78.
[780] R Lange, *The Social Impact of Colonisation and Land Loss on Iwi of the Rangitikei, Manawatū, and Horowhenua Region 1840-1960* (Wellington: Crown Forestry Rental Trust, 2010).
[781] Ibid, p 159.

the early 1950s due to the view that the economic return from the Crown's investment was too low.[782]

The view of waterways as a resource in service of economic growth continues, however, despite knowledge of the harm caused by large scale abstraction and discharge. The 2001 Horowhenua state of the environment report stated that demands for water were increasing from both urban reticulated water systems in the district as the population grew, and from changes in land use, including the intensification of land use for dairying and horticulture and increased rural settlement.[783] In the 1980s, the land used for berry crops in the Horowhenua County increased exponentially,[784] and in the decade from 1995 to 2005, the number of dairy cattle increased by 50 per cent across the Horowhenua district.[785] The report also presented a host of impacts wrought by these changes, including to water quality and the loss of wetland and dune lake indigenous habitats.[786] The report did not include or mention the impacts on Māori customary use of waterways, and provided no evidence of the Horowhenua District Council working with hapū and iwi to address these. There was also no mention of any council actions being taken to mitigate the intensification of land use for dairying and horticulture or its environmental impacts.

The *2006 State of the Environment Update on Subdivision and Development* also noted that considerable development had taken place in urban and coastal settlements and in the rural environment since 2001, including in those areas drawing their water supply from the Ōhau River.[787]

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782 Ibid, pp 164-170.

783 Horowhenua District Council, *Our Environment 2001: Horowhenua State of Environment Report* (Levin, Horowhenua District Council, 2001).

784 AJ Dreaver, 1984, p 298.

785 C Knight, 2014, p 216.

786 Horowhenua District Council, 2001.

787 Environmental Management Services Ltd, *2006 State of the Environment Update on Subdivision and Development* – Prepared for the Horowhenua District Council (Wellington, Environmental Management Services Ltd, 2006).

Figure 30: **Photograph of Martin Wehipeihana and Horace Lawton in the Ōhau River under the railway bridge taken in the 1950s.**[788]

As a consequence of these collective changes, water levels in the Ōhau River have dropped considerably since the 1950s. In supplying the above photograph, Yvonne Wehipeihana-Wilson explained that the water depth under the railway bridge today is barely knee-deep. Indeed, water abstraction from the Ōhau River increased dramatically in the 20 years from 1994 to 2014, where demand now exceeds supply.[789] In terms of the wider region, the abstraction of water for agricultural use increased by 446 per cent in the

[788] Photograph supplied by Yvonne Wehipeihana-Wilson.

[789] Horizons Regional Council, *One Plan: The Consolidated Regional Policy Statement, Regional Plan and Regional Coastal Plan for the Manawatū-Wanganui Region* (Palmerston North: Horizons Regional Council, 2014), p 5-6.

decade between 1997 and 2009, mostly due to increased irrigation on dairy farms.[790] While Horizons Regional Council has argued that groundwater sources are able to meet the demand, they have also stated that there is a need to actively manage the effects of groundwater takes on the river itself.[791]

In terms of active resource consents issued by Horizons Regional Council for the Ōhau River, there are nine current consents for water-take and two for discharge. No further details on the holders of the consents or the conditions contained in the consents have been forthcoming from Horizons Regional Council.[792]

4.6 Case Study Thirteen: Water Use and the Ōtaki River

The lands surrounding the Ōtaki River was a key site of pā and papakāinga for Ngāti Raukawa, and particularly for the hapū of Ngāti Katihiku and Ngāti Huia who have had continuous possession of the lower reaches of the river to the river mouth since their settlement in the region during the 1820s.[793] The Ōtaki River remains of significance to Muaūpoko also.[794] The river has been used as a mahinga kai for tuna, īnanga, kahawai, and kanae; as a puna rongoā; as a place to enjoy swimming; and as a system for waka transportation.[795]

4.6.1. Water Supply in Ōtaki

Newly formed in 1921, the Ōtaki Borough Council established a water supply system to the borough in 1922 via an intake from the Waitohu Stream.[796] As the borough population increased and demand for water grew, water supply from the stream was supplemented by two groundwater bores near the Ōtaki River for use at peak hour supply times to ensure adequate water pressure was maintained. Initially, these two bores were located in Tasman Road and Aotaki Street. While a start date for bore water supply has not been found, both were in operation by 1961.[797] In 2003, under management of the new Greater Wellington Regional Council, water supply from the Waitohu Stream ceased altogether

790 C Knight, 2014, p 216.
791 Horizons Regional Council, 2014, p 5-6.
792 Personal communication, Horizons Regional Council, June 2017.
793 TW Carkeek, in Poutama, Spinks, and Raumati, p 143.
794 Personal communication Emma Whiley of Bennion Law on behalf of Wai Claimants Muaūpoko Tribal Authority, email received during the Draft Report feedback stage, 20 June 2017.
795 See Appendix I.
796 Ōtaki Historical Society (Inc), *Historical Journal Volume 27* (Ōtaki: Ōtaki Historical Society, 2005), p 34.
797 Ian Macmillan & Co, letter to the Town Clerk, Ōtaki Borough Council, 12 December 1961. Kāpiti Coast District Council (Ōtaki Borough Council), 6/53, 351.

and water is now supplied from three bore sites; two located in Tasman Road (the second being operational in early 1975) and one in Rangiuru Road (installed in 1965).[798]

Ōtaki Borough Council records prior to 1947 were not available so it has not been possible to ascertain what engagement, if any, was undertaken with Ngāti Raukawa in relation to water abstraction from the Waitohu Stream. As with the previous case study on the Ōhau River, however, there are indications that the Ōtaki Borough Council's main priority was in purchasing land from Māori to secure the water use rights that were central to the dominant ideals of progress and prosperity. As pointed out in an article on Ōtaki in the *Evening Post* in June, 1914:

> 'Big schemes are mooted, and, once certain difficulties are overcome, chiefly the problem of Native lands, the place should grow rapidly.'[799]

While the Ōtaki borough was not supplied with water directly from the Ōtaki River, there have been other water supply systems which have drawn from it, namely the Hautere Water Scheme which opened in 1980. The scheme replaced the Hautere water races established by the Horowhenua County Council in 1903, where water was drawn from the Mangaone Stream. The new 1980 scheme was the result of an increased demand for water for both domestic and agricultural purposes as the area became more intensively settled and subdivided. Within 20 years, water demand had more than doubled.[800] Today the Hautere/Te Horo Rural Water Supply Scheme draws water from two shallow bores alongside the Ōtaki River, and supply is restricted as further subdivision has again increased the demand for water with supply becoming over-subscribed.[801]

4.6.2 Mangahao Hydro-electric Power Station

In the early 1900s, the idea of a hydro-electric power station in the inquiry district began to be considered by local businessmen. At a meeting in Shannon on 3 February 1911, a promotion committee of local flaxmillers, land developers, mayors, and Horowhenua County Council representatives was formed who resolved to request the government to

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798 P Wallace, *Waitohu Stream Study Summary Document* (Wellington: Greater Wellington Regional Council, 2006), p 18.

799 'Town and Country – Their Mutual Interdependence: The Rise of Rural Centres, Manawatū Borough', in *Evening Post*, Volume LXXXVII, Issue 142, 17 June 1914.

800 R Kerr, *Ko Ōtaki te Awa: Ōtaki River* (Ōtaki: Black Pony, 2012), pp 99-100.

801 See http://www.kapiticoast.govt.nz/services/A---Z-Council-Services-and-Facilities/Water/Water-Treatment/

survey the Mangahao and Tokomaru Streams to ascertain their suitability as a source of hydro-electricity generation for flaxmilling and other industries. Support for the idea grew through the involvement of the local Member of Parliament, W.H. (Willie) Field who in turn persuaded the Chief Electrical Engineer of the Public Works Department of the possibilities of the scheme. Following survey work in 1915, the Crown settled on a plan to divert water from the Mangahao Stream, a tributary of the Ōtaki River, which would be trapped behind two dams (one located on the Tokomaru River to provide an additional supply of water) and then sent via tunnels to a controlling surge chamber for a 900 feet drop to a power station located on the Mangaore Stream.[802]

Progress on the scheme was halted because of World War One, but in 1919 the Crown moved ahead with the scheme, adopting the report of E. Parry, the Chief Electrical Engineer. An inaugural banquet, attended by the Minister of Public Works, Sir William Fraser, was held in Shannon on 28 February 1919 to mark the start of the work programme.[803] Construction was plagued by a number of issues, including the steep terrain and frequent flooding. In 1921, the government's tendering process to procure equipment from England was also deferred due to mining strikes.[804]

The first hydro-electric power plant to be built in the North Island, and the largest in the country at the time, the Mangahao Power Station was opened on 3 November 1924 by the Prime Minister, the Rt. Hon. W.F. Massey. The power generated was first distributed to Shannon and then throughout the Horowhenua district and by 1927 it was also supplying Wellington, Whanganui, the Manawatū, and across the Ruahine Ranges to the Wairarapa and Hawke's Bay. The power station was finally completed when a third dam at Arapeti was finished in April 1928.[805]

Despite its significance and size, archival searches found no evidence of local government or Crown engagement with Ngāti Whakatere in relation to the diversion of water from the Mangahao Stream and Tokomaru River into the Mangaore Stream for the power station development, and it appears no consideration was given to its impacts on

802 Law, 1987, pp 104-105.
803 Ibid, p 105.
804 Cabinet note, Minister of Public Works, 11 April 1921. Archives New Zealand, Wellington, AAD0 W2961 569 Box 292, Record 58/17.
805 Law, 1987, pp 112, 120.

their customary use of these waterways or that the diversion of water would negatively impact on the mauri of the waterways involved.

4.6.3 Proposal for Hydro-electric Power Generation

In 1973, the New Zealand Electricity Department presented a report entitled 'Report of the Planning Committee on Electric Power Development in New Zealand' which encouraged local supply authorities to investigate the economic development potential of the smaller rivers in their local catchment areas. It served to reignite the Horowhenua Electric Power Board's already existing interest in the further hydro-electric power generation potential of the Ōtaki catchment area – and in the face of electricity shortages, they commissioned a pre-feasibility study in 1974. The study identified numerous projects, with two, a high-head project and a low-head project, identified for possible development that would each involve the construction of a compounding dam on the Ōtaki River. The report concluded that further investigation of the high-head project was economically and financially justified.[806]

Following this, the Horowhenua Electric Power Board undertook a preliminary environmental impact report of the high-head scheme to gain the necessary permission from the New Zealand Forest Service to proceed further. Approval would also be required by the Manawatū Catchment Board for water use rights, the Minister of Forests for works in a state forest, and the Minister of Electricity for authority to generate power.[807] Meetings were also held to inform the public of the general aspects of the proposal.[808]

The report was audited by the Commission for the Environment who received 186 submissions on the report from Crown ministries and government departments, councils, environmental groups, and recreation groups, the vast majority of whom opposed the scheme. There were no submissions received from iwi, hapū, or marae and none appear to have been specifically sought.[809] Neither the environmental impact report, nor the Commission's audit of it, addressed the impacts of the scheme on the customary use of

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806 Ōtaki Historical Society (Inc), *Historical Journal Volume 4* (Ōtaki: Ōtaki Historical Society, 1981), p 68.

807 Commission for the Environment, *Horowhenua Electric Power Board Hydro Electric Investigation of the Ōtaki River: Environmental Impact Audit* (Wellington: Commission for the Environment, 1975), pp 1-2.

808 Ōtaki Historical Society (Inc), 1981, p 70.

809 Commission for the Environment, 1975, p 2 and Appendix I.

the Ōtaki River by Ngāti Raukawa but instead focused on issues such as the impacts on state forests and its scenery and wildlife, fisheries, and particularly on recreation use. Also of issue was the impact of flow rates on shingle movement and a reduction in its availability for gravel extraction.[810]

The New Zealand Forest Service declined permission for further investigation of the high-head scheme and, drawing on the evidence submitted, the Commission recommended that the Horowhenua Electric Power Board not proceed and instead investigate alternative proposals.[811] The Horowhenua Electric Power Board then commissioned a further study of the low-head scheme.[812]

Around this time, the government announced details of a policy package to support the development of local hydro-electric power stations, which included funding for detailed investigative work and criteria to evaluate scheme proposals. In February 1978, the Horowhenua Electric Power Board submitted a funding application under this policy for the low-head scheme. This was subsequently declined by the Committee on Local Authority Hydro Development on the grounds that it would not yield a substantial net national benefit. Following these set-backs the Board resolved to discontinue further investment in the scheme, and it was put to the side.[813]

It did not end there, however, as a Ministry of Works and Development committee commissioned a further investigation of the hydro-electric potential of the Horowhenua region.[814] The report, released in 1980, determined that the low-head scheme on the Ōtaki River was not economically viable due to the cost of spillway provisions that would be necessitated by its unusually large flood flows. As with previous reports, this report did not consider the impacts of hydro-electric development on Māori customary use of the Ōtaki River. [815]

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[810] Tonkin Muir Energy Group, *Hydro Electric Investigation of the Ō taki River: Preliminary Environmental Impact Report* (Wellington: Horowhenua Electric Power Board, 1975), Alexander Turnbull National Library Ref no. PAM333.91414099359HOR1975; Commission for the Environment, 1975.

[811] Ibid.

[812] Ōtaki Historical Society (Inc), 1981, p 72.

[813] Ibid.

[814] Ibid.

[815] Tonkin & Taylor, *Assessment of Local Hydro-electric Potential: Horowhenua Region* (Wellington: Tonkin & Taylor, 1980), Paraparaumu Library.

The Horowhenua Electric Power Board was still clearly interested in the hydro-electric potential of the Ōtaki River into the early 1980s, despite these set-backs and strong public opposition.[816] So too was the Ōtaki Borough Council who were interested in the capacity of the proposed scheme to provide an alternative future water supply for the borough.[817] To this end, a preliminary assessment of the irrigation potential of a hydro-scheme for the expansion and intensification of horticulture in the Ōtaki area was undertaken in 1982.[818]

However, by the end of the decade, there was an about-face on the issue of hydro-electric development on the Ōtaki River. In 1989, the newly formed Department of Conservation undertook a management plan review of the Tararua Conservation Park. The discussion paper released as part of the review noted that:

> 'Provisions for … hydro-electric development are no longer considered to be a priority for park management and any applicants for such facilities will be required to fulfil stringent conditions before their applications are considered.'[819]

The primary objectives of park management were instead to protect the natural and historic resources of the park, as provided by section 19(1) of the Conservation Act 1987, and to manage it in a manner consistent with sound soil and water conservation principles.[820] Conservation of water resources was deemed important to protect the agricultural, industrial, and residential values of the lands into which the ranges waterways flowed, and to ensure that current and future water demands for domestic and industrial use would be protected.[821] The secondary objective of park management, subject to the primary objective, was to facilitate public recreation and enjoyment.[822] To meet these objectives, the general policy on hydro-electric development was that no such developments within the park would be supported.[823] What did not change, however, was

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816 Ōtaki Borough Council, letter to the Horowhenua Electric Power Board, 23 September 1982. Kāpiti Coast District Council (Ōtaki Borough Council), 7/46 and 7/47, G9.
817 Horowhenua Electric Power Board, letter to the Ōtaki Borough Council, 28 September 1982. Kāpiti Coast District Council (Ōtaki Borough Council), 7/46 and 7/47, G9.
818 *Irrigation from the Ōtaki River: A Preliminary Assessment*, 31 May 1982. Archives New Zealand, R1215126, AATE W3892 Box 5, record no. 96/0/8/2.
819 Department of Conservation, Tararua Conservation Park: A Discussion Paper for the Management Plan Review (Wellington: Department of Conservation, undated), p 1, Paraparaumu Library.
820 Ibid, p 5.
821 Ibid, pp 6-7.
822 Ibid, p 5.
823 Ibid, p 11.

the absence of any consideration of Māori customary use rights, which did not rate a mention in the Department of Conservation's discussion paper.

While larger-scale hydro-electric power schemes were off the table a small-scale, private hydro station was built utilising the Pukeātua Stream, a steep narrow tributary of the Ōtaki River.[824] In 1993, the hydro station was registered as the company Pukeatua Power, and a 10 year supply contract was signed with Horowhenua Energy in 1994.[825] However, the company's scheme was short-lived, being destroyed in the same year from a landslide caused by heavy rainfall.[826]

4.6.3 Ōtaki River Pipeline Proposal

Unprecedented levels of population growth in the urban areas of Waikanae, Paraparaumu, and Raumati resulted in a greatly increased demand for water from the Waikanae Water Treatment Plant which sources its water from the Waikanae River.[827] In the early 1990s, the newly formed Kāpiti Coast District Council began to investigate alternative water supply options to meet this demand into the future. In 1996, the council identified the Ōtaki Wellfield and Pipeline proposal as its preferred option for a supplementary water supply, where water would be piped into the Waikanae Water Treatment Plant from a wellfield fed by an aquifer connected to the Ōtaki River.[828]

The proposal was strongly opposed by the Ōtaki community, and in particular by Ngāti Raukawa on the basis that the water take would further threaten the already compromised ecosystem of the river and the breeding grounds of taonga species such as īnanga, patiki, and kahawai. Their opposition was also supported by the Ōtaki Community Council, the Ministry for the Environment, and groups such as Forest and Bird and recreational fishers.[829]

Despite this opposition, the Kāpiti Coast District Council approved the proposal and began preliminary design and costing work, and further assessment of the project.

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824 R Kerr, 2012, pp 135-136.
825 Ōtaki Historical Society (Inc), *Historical Journal Volume 18* (Ōtaki: Ōtaki Historical Society, 1995), p 76.
826 R Kerr, 2012, p 136.
827 Ibid, p 180.
828 Woodward-Clyde (NZ) Ltd, *Kāpiti District Water Supply Project: Ōtaki Wellfield – The Preferred Option, Prepared for the Kāpiti Coast District Council* (Wellington: Woodward-Clyde (NZ) Ltd, 1998), p ES-1, Paraparaumu Library.
829 R Kerr, 2012, p 180.

Further assessment included a programme of consultation with iwi. These respective reports, undertaken on their behalf by engineering consultants Woodward-Clyde, were released in February 1998.[830] As detailed in the assessment report, the consultation strategy focused on minimizing community objection to the project,[831] with consultation with iwi positioned as a necessary step to support the council's future resource consent application documentation required under the Resource Management Act 1991.[832] The report noted that opposition from Ngāti Raukawa was based on the impacts of the water take on both the physical sustainability of the resource and the spiritual values associated with the Ōtaki River,[833] with Te Āti Awa ki Whakarongotai raising questions about a consultation process on a singular proposal that appeared to be fait-accompli and which did not include iwi views on viable alternatives.[834] Iwi opposition was, however, clearly an issue to be contained and marginalised with the report focused on further development of the proposal.

But iwi opposition was not able to buried in council processes. The campaign of Ngāti Raukawa to oppose the proposal continued and included an application to the Commission for the Environment and a claim to the Waitangi Tribunal – both of whom found in their favour and recommended the proposal not go ahead.[835]

In 2001, the Joint Hearing Committee comprised of three commissioners appointed by the Wellington Regional Council and the Kāpiti Coast District Council considered the Kāpiti Coast District Council's application for consent for land use and water take for the project. Written and oral submissions from Te Rūnanga o Raukawa Inc and Kapakapanui (Te Rūnanga o Te Āti Awa ki Whakarongotai Inc), along with submissions from those representing Ngā Hapū o Ōtaki, raised numerous issues related to their customary use rights guaranteed under Te Tiriti o Waitangi. Key issues were that the proposed abstraction would add to the already degraded state of the Ōtaki River from decades of inappropriate use and development, effecting natural and physical resources, and the

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830 Woodward-Clyde (NZ) Ltd, *Kāpiti District Water Supply Project – Preliminary Design Report, Prepared for the Kāpiti Coast District Council* (Wellington: Woodward-Clyde (NZ) Ltd, 1998), Paraparaumu Library; and Woodward-Clyde (NZ) Ltd, *Kāpiti District Water Supply Project: Ōtaki Wellfield – The Preferred Option, Prepared for the Kāpiti Coast District Council*, 1998, Paraparaumu Library.

831 Ibid, p 2-1.

832 Ibid, pp 1-6, 2-3

833 Ibid, p 2-3.

834 Ibid, p 2-4.

835 R Kerr, 2012, p 181.

mauri of the river.[836] It was also submitted that the transfer of Ōtaki River water to the Waikanae River would compromise the mauri of both rivers.[837]

One submitter, Mahinārangi Hakaraia, made clear to the Committee that:

> 'For over three years, the KCDC has been fighting against the people of Ōtaki, and I would like to say they have a long fight on their hands because behind the kaumatua stand the matua and behind them the rangatahi – three if not four generations ready to wero the Council's proposal to take this water, our future …. Our river is sicker than it used to be, but as kaitiaki we are not prepared to allow it to die.'[838]

After consideration of the application, the Committee concluded that the Kāpiti Coast District Council's proposal could not be justified as it was inconsistent with a sustainable management approach.[839]

As with the hydro-electric proposal, and as feared by at least some of the iwi submitters, this was not the last word on the matter.[840] While the council eventually decided not to appeal the joint committee's decision, the Ōtaki pipeline proposal was back on the council's table in February 2009 and in May 2010.[841] The water supply issue had been addressed by the installation of groundwater bores to supplement supply from the Waikanae River, but complaints about its taste and damage to kettles and other electrical appliances from the water's high mineral content brought the issue back to the council table. Iwi opposition to the proposal was again non-negotiable and, in 2010, the council resolved to consider other "in-catchment" alternatives.[842] As part of that process, the council also revamped costings of the Ōtaki pipeline proposal and determined that it was an altogether unaffordable option.[843] In September 2013, the Waikanae River Recharge Scheme was approved by the Wellington Regional Council which allows the Kāpiti Coast

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836 Joint Hearing Committee, *Ōtaki Pipeline Project: Decision of the Joint Hearing Committee* (Wellington: Joint Hearing Committee, 2001), pp 17, 21, Kāpiti Coast District Council.
837 Ibid, pp 21-22.
838 R Selby & M Hakaraia, 'The Ōtaki Pipeline: Background and Submission', in *Te Ukaipo* 3, 2001, pp 44-47.
839 Joint Hearing Committee, 2001, p 35, Kāpiti Coast District Council.
840 R Selby & M Hakaraia, 2001, pp 44-47.
841 R Kerr, 2012, p 181.
842 K Blundell, 'Iwi Stand Firm in Opposing Use of Ōtaki River Water', in *Dominion Post*, 13 March 2010.
843 B Strang, 'Water Plans Burst the Bank', in *Kāpiti Observer*, 29 July 2010.

District Council to increase its water take from the Waikanae River by adding groundwater to the river below the water treatment plant during very dry periods.[844]

As the demand for water resources in the Kāpiti Coast continues to increase, however, the Ōtaki pipeline proposal may again find its way onto the district council table.

4.7 Case Study Fourteen: Water Use and the Oroua River

In the Oroua River Declaration, signed in December 2015 by Sir Mason Durie for Ngāti Kauwhata and Mayor, Margaret Kouvelis, for the Manawatū District Council, Ngāti Kauwhata included the following statement about the Oroua River:

> 'The River traverses the mana whenua of Ngāti Kauwhata and has been integral to the distinctiveness of Ngāti Kauwhata for more than 180 years. Ngāti Kauwhata has long regarded the River as a source of food, a recreational opportunity, a pathway between sites of importance, a place for spiritual revitalisation, and a marker of tribal identity.'[845]

4.7.1 Water Supply from the Oroua River

Plans to establish a reticulated water supply and sewerage scheme in the town of Feilding began in the early 1890s.[846] The Feilding Borough Council commissioned an investigation in 1899 to provide guidance on a scheme, which considered a number of water sources including the Oroua River, the Kiwitea Stream, and the Makino Creek.[847] The report, presented to the council in December that year, recommended a water supply scheme be developed from the Kiwitea Stream and a septic tank sewerage system with effluent and storm-water overflow draining into the Oroua River.[848] The council deliberated the recommendation for a number of years, with the Water and Drainage Committee resolving in 1902 to instead use the Oroua River as the water source because of its superior water quality.[849] Both schemes were operational in March 1906.[850] 'No more striking feature of the development of the Dominion is to be seen that the growth of

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844 See, http://www.kapiticoast.govt.nz/Your-Council/Projects/Water-Supply-Project/.
845 Ngāti Kauwhata and Manawatū District Council, *Oroua River Declaration* (2015).
846 'Artesian Water', in *Feilding Star*, Volume XIII, Issue 81, 7 January 1892.
847 It is likely the name was inaccurately recorded historically as it is now known as the Mangakino Creek. Personal communication, Dennis Emery, email received during the Draft Report feedback stage, 28 June 2017.
848 RL Mestayer, *Borough of Feilding: Report on Scheme for Water Supply and Sewerage* (Wellington, 1899), pp 1-2, 8-9 Central Archives, MDC 00001:10:1.
849 'Water and Drainage Committee', in *Feilding Star*, Volume XXIII, Issue 1407, 11 April 1902.
850 'Feilding Borough Council', in *Feilding Star*, Volume XXVII, Issue 194, 16 March 1906.

the rural towns' claimed the *Evening Post* in June 1914, with high-pressure water supply helping to make Feilding a 'thriving agricultural centre'.[851]

The water supply, however, left much to be desired as it was cloudy and discoloured with silt and fine clay whenever the river was in flood – which was exacerbated, at times, by erosion around the intake site.[852] In 1910, a scheme was proposed for the settling and mechanical filtration of the water supply, and, while implemented some time later, the filtration units were poorly maintained and fell into disuse. The situation was again addressed in 1942 when soak wells were constructed adjacent to the intake, providing an alternative means of supply during times of flood. Increased demand for water necessitated the construction of a third soak well in 1952. However, the problem of discoloured water kept recurring as in times of prolonged flooding, water was supplied by a combination of both sources.[853] By 1961, Department of Health tests had also revealed that the water supply was contaminated by 'not unhealthy' levels of bacteria, suspended solids, and various chemicals. In response, the borough engineer recommended chlorination for a safe and plentiful water supply, [854] and a loan to augment and treat the water supply was applied for in 1963.[855] The water treatment plant was installed in 1967.[856]

While the issue of shortages in the town water supply during dry summer months had been raised since the early years of the scheme,[857] by the mid-1970s increased demands on the Oroua River as a source of water meant that its supply capacity was fully allocated. As a consequence, the Manawatū Catchment Board's water committee recommended the board only allocate half the volume of water applied for by the Feilding Borough Council until an allocation plan had been developed for the whole catchment.[858]

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851 'Town and Country: Their Mutual Interdependence – The Rise of Rural Centres', in *Evening Post*, LXXXVII, Issue 142, 17 June 1914.

852 'Silt in the Intake Pipes', in *Feilding Star*, Volume XIII, Issue 3267, 15 June 1917.

853 Report on the Treatment of the Borough Water Supply, from the Borough Engineer to the Feilding Borough Council, April 1961. Archives Central, MDC 00005:29:38/1/1.

854 Ibid

855 Application to the Local Government Loans Board for Approval to Raise £225,000 for the Purpose of Augmenting and Treating the Borough's Water Supply, Feilding Borough Engineer, May 1963. Archives Central, MDC 00005:29:38/1/1.

856 Truebridge Associates, *Report on Water Supply Augmentation for the Borough of Feilding* (Feilding: Truebridge Associates, Consulting Engineers, 1976). Archives Central, MDC 00005:30:38/10.

857 'Municipal Politics', in *Feilding Star*, Volume XV, Issue 3769, 19 April 1919.

858 'Demand for Water Causing Problems', in *Palmerston North Evening Standard*, 8 September 1977. Archives Central, MDC 00005:30:38/10.

As with the previous case studies, a search of Feilding Borough Council archives was undertaken and no evidence was found of any engagement between the council and Ngāti Kauwhata on the development of the water supply and sewerage schemes, and nor that the council had considered the impacts of water abstraction or the discharge of sewage effluent on their customary use of the Oroua River. Indeed, that the decision to discharge sewage effluent could be contemplated and made demonstrates there was little to no recognition of the significance of the Oroua River to Ngāti Kauwhata or understanding of and respect for the kaitiakitanga principles that underpin their customary use relationship. This was further entrenched by the passage of the Manawatū-Oroua River District Act 1923 which vested control of the Oroua River in the Manawatū-Oroua River Board and marginalised the mana whenua status and customary use rights and interests of Ngāti Kauwhata. The Act also made no provision for their representation on the river board that it established.

It also appears that a proposal to develop a hydro-electric power plant on the Oroua River was floated in 1918.[859]

4.7.2 Irrigation for Farming and Related Industries

Farming was a key industry for Pākehā from the beginning of their settlement in the Oroua River area, with extensive tracts of land leased from Ngāti Kauwhata land owners for farming beef and sheep from the 1850s and 1860s.[860] By the 1870s this had extended to dairy farms which tended to be concentrated around rivers for ease of water supply, including the Oroua River, and a dairy factory was subsequently built in around 1885. This was seen as a 'great boon' to the local economy, where waste milk would be turned into money from cheese and butter bringing wealth to the district.[861] Feilding was also growing in importance as a stock market which led to the establishment of the Feilding Farmers' Freezing Company Limited in 1916.[862]

Alongside supply to the town of Feilding and surrounding rural areas, water from the Oroua River supplied the farms and related industries of the borough connected to the borough supply, such as freezing works and wool scourers, as well as several irrigation systems. By mid-1970, these demands on the river had increased to the point where

859 'Correspondence', in *Feilding Star*, Volume XIV, Issue 3493, 13 March 1918.
860 C Knight, 2014, p 113.
861 Ibid, pp 128, 216.
862 Ibid, p 125.

supply was fully allocated.[863] In response to summer water shortages and to reduce draw-off from the borough supply in the face of proposed expansions, the abattoir also established an independent supply in 1976 from a groundwater bore to ensure maintenance of an adequate flow.[864] Ground water bores had also been installed to supply a supplementary water source to the saleyards, the Kowhai Bacon Company, and Borthwicks freezing works in the early-mid 1970s.[865] However, use of these bores was limited by inadequate supply so that the river remained as the primary source of water for all water users. High levels of abstraction from the Oroua River continued, and indeed increased in the following decades as land use for agriculture expanded and intensified, and the problem of unnaturally low flows during dry periods, and particularly in the summer months, worsened. [866] By the late 1980s, the Manawatū District Council's permitted water take from the Oroua River was exceeding its allocation and it was coming under increasing pressure from the Manawatū-Wanganui Regional Council to reduce its daily and hourly take.[867] This has had an associated impact on the river's downstream water quality due to its diminished flow capacity to dilute the ever-larger volumes of waste discharged to it.

Again, archival searches of council records on water supply to farms and industry over this period and extending to 1989, found no evidence of council engagement with Ngāti Kauwhata regarding the supply of water from the Oroua River, nor of council consideration of the impacts of ever-increasing water take on their customary use relationship with the river.

While the Water and Soil Conservation Act 1967 authorised catchment boards (and later regional councils) to control water take within a 'multiple use' framework, it was not until 1990 that the Manawatū-Wanganui Regional Council turned to address the growing

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863 Manawatū Catchment Board, letter to the Feilding Borough Council, 6 July 1977. Archives Central, MDC 00005:30:38/10.

864 AD Truebridge, *Alternative Water Supply for the Abbatoir* (Feilding, undated). Archives Central, MDC 00005:30:38/10; and AD Truebridge, Feilding Borough Council: Specification for the Supply and Installation of Pumping Equipment for the Abbatoir Water Supply (Feilding, undated). Archives Central, MDC 00005:30:38/10.

865 Feilding Borough Engineer, letter to Brickell, Moss & Partners, Consulting Engineers, 21 October 1985. Archives Central, MDC 00005:30:38/11.

866 Ministry of Agriculture and Ministry for the Environment, *Transferable Water Permits: Two Case Studies of the Issues – MAF Policy Technical Paper 97/12* (Wellington: Ministry of Agriculture and Ministry for the Environment, 1997).

867 S Chamberlain, *Water Conflict Issues in the Oroua River Catchment* (Palmerston North: Massey University, 1994), p 41.

conflict between water abstraction and water conservation of the Oroua River. A voluntary agreement was developed and adopted by the council in 1991, where conditions were placed on the water permits for both the Feilding municipal supply and for irrigation.[868] The agreement restricted water take as the river flow declined down to a minimum core allocation that was allowed regardless of flow. The council viewed its regime as a 'pragmatic compromise' in that it sought to protect the multiple uses of both economic and recreational interests; but did not include protection of or support for the customary use rights of Ngāti Kauwhata.[869] The Act included no provision for councils to engage or consult with iwi holding mana whenua, and subsequently, it appears none occurred in the development of this agreement.

Under the new Resource Management Act 1991 (RMA), the 'multiple use' framework was replaced by the promotion of sustainable management and the setting of minimum flows to safeguard the life-supporting capacity of waterways, where water take would be reduced in times of low-flow.[870] The Manawatū-Wanganui Regional Council resisted the setting of minimum flow rates for the Oroua River in the development of their regional plan required under the RMA, and instead wanted to continue to supply a minimum core allocation for town supply and irrigators even in times of low-flow. The council argued that implementing a low-flow regime would prevent communities from providing for their social and economic wellbeing. During hearings on the plan it was determined that the use of minimum flows was necessary to achieve the purposes of the Act and worked with the council to establish them.[871] The Manawatū-Wanganui Regional Council water allocation plan was released in 1994.[872] While it was claimed that the minimum flow regime would protect environmental values, and in particular Māori cultural and spiritual values,[873] there was no evidence in the plan of council engagement with Ngāti Kauwhata in the development of the plan or in the setting of minimum flow rates.

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868 Ministry of Agriculture and Ministry for the Environment, 1997, p 6.

869 Manawatū-Wanganui Regional Council, *Oroua Catchment Minimum Flows Plan Discussion Document* (Palmerston North: Manawatū Wanganui Regional Council, 1992), Annex A: Voluntary Water Management Agreement – Oroua River.

870 S Chamberlain, 1994, p 23.

871 Ibid, pp 30-40.

872 Manawatū-Wanganui Regional Council, *Oroua Catchment Water Allocation and River Flows Regional Plan* (Palmerston North: Manawatū-Wanganui Regional Council, 1994).

873 Ministry of Agriculture and Ministry for the Environment, 1997, p 7.

> ‘One of the good things for Maoridom was the RMA Act and the reform of the local councils Act …. But the bad thing was Māori never got representation in there. That’s the biggest downfall because they then became responsible for all these environmental impacts but Māori had no representation, even the regional council today. Who is Kauwhata’s representative there? They haven’t got one… so they’re free to do what they want. A lot of it is our own fault. I got hōhā. I was going to meetings over there every week, arguing the same things, time after time, getting nowhere. We were not resourced, it was all off our own backs. We didn’t expect to be resourced, but we did expect to be listened to, or come back with an answer or something like that. But no, they just wear us down in the end.’ Steve Bray, Ngāti Kauwhata.[874]

In the face of very high demands for water from the Oroua River and need to particularly protect economic interests in the use of water, a transferable water permits system was also advocated for by the Crown in the hearings to develop the Regional Plan. Provided for in the RMA, the argument put forward was that they would provide flexibility for water users to transfer their water permits between themselves to enable the efficient use of water within the flow limits set out in the 1994 Regional Plan. Following a public submission process and further hearings a limited transferable permit system was developed and approved, where transfer or trade of water permits was limited to periods of low-flow and limited to agricultural irrigators – although many of these irrigators felt it created a more uncertain water supply for their interests.[875] These were included in the Regional Plan change in 1997.[876] Again, there was no evidence in the new plan of council engagement with Ngāti Kauwhata in the development of the transferable water permit system.

While sheep and beef farming is still the predominant land use in the Manawatū district, making up 53 per cent of the total land area, there has been a significant increase in dairying from the early 1990s. There has necessarily also been a significant increase in

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874 Interview with claimants from Ngāti Kauwhata at TROR, Levin, 8am, 6 September 2016.
875 Ibid, pp 7-15.
876 Manawatū-Wanganui Regional Council, *Oroua Catchment Water Allocation and River Flows Regional Plan (Change 1)* (Palmerston North: Manawatū-Wanganui Regional Council, 1997).

irrigation as a result: 446 per cent across the wider regional council catchment, putting yet more pressure on its now over-allocated water resources, including the Oroua River.[877]

In terms of active resource consents issued by Horizons Regional Council for the Oroua River, there are 15 current consents for water-take and 10 for discharge. No further details on the holders of the consents or the conditions contained in the consents have been forthcoming from Horizons Regional Council.[878]

4.7.3 Waste Water Discharge into the Oroua River

Bringing with them their view of rivers as convenient sewers to be used for the disposal of waste, pollution of the Oroua River has almost as long a history as Pākehā settlement in its catchment area. Discharged refuse from flaxmills into the Oroua River was identified as a problem as early as the late 1880s.[879] From the dawn of the new century, and in line with the increase in agriculture, untreated discharges from its factories such as abattoirs, meat works, wool-scourers, and dairy factories, began to also have a noticeable effect on the Oroua River.[880] So too did the establishment of the Feilding sewerage scheme in 1906, not only because of the discharge of the septic tank effluent into the river but because solid matter was also discharging out of it into the river.[881]

As the region's economy grew over the ensuing decades, so too did the impacts of industry on water quality. Meatworks and dairy factories were deliberately sited on the Oroua River in order to draw its water and discharge their waste into it. From the 1950s, discharges from industry had grown to a point that they equaled – if not superceded – town sewage in their magnitude. Gross pollution, that is, pollution created by solid or other visible materials, was becoming increasingly difficult to ignore. In particular, freezing works in Feilding discharged wool, fat, blood, and entrails into water, sometimes resulting in mats of bacteria called "sewage fungus". These discharges continued uncurbed, as there were few controls in place to regulate or sanction those responsible for it.[882]

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877 C Knight, 2014, p 216.
878 Personal communication, Horizons Regional Council, June 2017.
879 C Knight, 2014, p 155.
880 Ibid, p 181.
881 'Manawatū County Council Monthly Meeting', in *Feilding Star*, Volume XI, Issue 2881, 8 December 1915.
882 C Knight, 2014, pp 183-184.

> ‘We used to love swimming in the Oroua. Absolutely loved it because the water was and the reason it was warm was because of the discharge from the freezing works. So you enjoyed the warm water, but bits of cow and sheep would come floating past right through the 1950s and 60s.’ Edward Tautahi-Penetito, Ngāti Kauwhata.[883]

> ‘There used to be a period where … they wouldn’t let any effluent go because it would swirl back, but after the works finished at 5 o’clock everything was let go and that’s when it was blood and everything came down the river. It was good for the eels, the eels loved it, but if you were swimming you knew you had to get out of the river. Both of us swam in the river and in the summertime it was beautiful … but after 5 o’clock you stayed away.’ Donald Tait, Ngāti Kauwhata.[884]

The Crown was slow to address the growing problem of water pollution from discharges, and instead acted to uphold the economic interests of industry. It was not until the Water Pollution Act of 1953 that anything was put into place. The Act established the Pollution Advisory Council with the responsibility of preventing and abating water pollution, and which could receive complaints and undertake investigations, but had no powers to enforce change.[885] The Pollution Advisory Council undertook its first investigation in the Manawatū catchment and reported in 1957 that the Oroua River was regarded much like an open sewer – simply a convenient place to dispose of effluent. It found the river was gravely polluted downstream of Feilding, the product of mainly industrial discharges, but also of septic tanks.[886]

In response to these findings, the Feilding Borough Council began to plan for the modernization of the municipal sewerage system which would involve the construction of a sewage treatment plant. In line with the Water Pollution Act, it would also be expanded to service the town’s proposed industrial area, and the abattoirs and boiling down works. It was envisaged that other industries would be connected to the new system, including the local saleyards and the Feilding Bacon Company – but the dairy and wool scour companies would not be encouraged to be included in the scheme as it was thought they

883 Interview with claimants from Ngāti Kauwhata at TROR, Levin, 8am, 6 September 2016.
884 Ibid.
885 C Knight, 2016, pp 83-85.
886 C Knight, 2014, p 184.

would be able to treat their own wastes more economically.[887] This was later reconsidered and the dairy factory and wool-scourers were to be included in the scheme, with further consideration to be given to the wastes of the meat works.[888] Inspections of the existing sewerage system also found that all of the earthenware pipes of 29 miles of sewers were defective at the joints and would also need to be replaced.[889]

However, the council's decision to build a sewage treatment plant by the Oroua River was to have lasting deleterious effects on Ngāti Kauwhata.

> 'The Oroua River, starting upstream from Awahuri, the main area of Ngāti Kauwhata habitation, has been unstable throughout the whole of my lifetime due to the discharge of animal waste from the local meat processing and freezing works on the outskirts of Feilding, and other factories. Throughout my lifetime the dream of our people has been to return the river to what it was. However, matters took a turn for the worse in 1962 when the Māori reserve land at Awahuri was taken under the Public Works Act for a wastewater treatment plant for Feilding and treated sewage was put into the river – downstream from the Pākehā town but upstream from the Māori customary 'town' at Awahuri…. Such discharge is a deeply spiritual offence to Māori and is one of the reasons why Ngāti Kauwhata whānau of Awahuri and of Kauwhata marae on the opposite bank sold up and moved away from the area in the 1960s and 1970s.'[890]

By May 1962, land was being acquired for the sewerage scheme – some 118 acres of which half was in Māori ownership and would be acquired under the Public Works Act 1928 with the Māori Trustee to investigate compensation for the Māori land held in multiple ownership, namely the 29 owners of Aorangi, No. 1 Sec. 4C6. In the main, compensation for Pākehā-owned land was valued at over twice that of Māori-owned land

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887 Feilding Borough Council, *Preliminary Report to the Local Government Loans Board for the Loan of £100,000 for the Renewing of Portions of the Existing Sewerage System in the Borough of Feilding* (Feilding: Feilding Borough Council, undated). Archives Central, MDC 00006:4:8.

888 Commissioner of Works, letter to the District Commissioner of Works, 22 July 1958. Archives Central, MDC 00006:4:8.

889 Feilding Borough Council, Sewerage Loan Proposal, 13 March 1959. Archives Central, MDC 00006:4:9.

890 DB Emery, Affidavit to the Waitangi Tribunal for the National Freshwater and Geothermal Resource Inquiry, Wai 2358, 2 September 2016.

based on it being 'first class English pasture'.[891] At a meeting with land owners in September of that year, the Mayor advised that the site for the plant was ideally situated because it was "well away from other houses".[892] By early 1966, all Māori owned land required for the plant had been acquired. Compensation of £2,982 for the 59 acres in multiple Māori-ownership was paid to the Māori Trustee on 25 February 1966.[893]

There was no record of engagement with Ngāti Kauwhata over the plant site in the Feilding Borough Council archives, and no evidence to suggest that any consideration was given of their interests in any way. Instead, council's singular concern was about expediting the purchase of land to build a plant for the "good of all".

The plant was officially opened with much fanfare by the Minister of Health and some 300 guests on Thursday 9 March, 1967.[894] Indeed, the Feilding Borough Council's invitation list to the event was extensive and included: its past and present mayors and councillors and staff; the councillors and clerks of the district's county councils; the mayors and other officials of the district's towns; prominent locals, business owners, industry heads, and representatives of organisations like Rotary and Lions; representatives from the Pollution Advisory Council and the Department of Health; contractors; and the Pākehā property owners whose land had been purchased for the scheme. The list, however, did not include any of the Māori land owners whose land had been compulsorily acquired or any representatives from Ngāti Kauwhata or anyone identifiable by name as Māori.[895]

During this period, the Crown increased the powers of the Pollution Advisory Council. This enabled them to classify waterways according to current and potential uses, with all discharges into them registered by a permit which set out the conditions under which the discharge could be made so as to maintain their classification. In another shameful first,

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891 DJ Lovelock & Co. Ltd, Valuers, Land, Estate and Insurance Agents, letter to the Feilding Borough Council, 18 May 1962, Archives Central, MDC 00005:50:48/2/1; Department of Māori Affairs, letter to the Feilding Borough Council, 1 February 1966, Central Archives, MDC 00005:50:48/2/1; and Māori Land Court Search of Aorangi No. 1, Sec. 4C6,11 April 1900, Archives Central, MDC 00005:50:48/2/1.

892 Minutes of meeting with Feilding mayor and land owners, 6 September 1962, Central Archives, MDC 00005:50:48/2/1.

893 Receipt of payment to the Māori Trustee, 25 February 1966, Archives Central, MDC 00005:50:48/2/1.

894 'Official Opening of New Water & Sewage Plants', in *Feilding Herald*, Volume 6, Issue 16, 14 March 1967, Archives Central, MDC 00005:76:94/1.

895 List of Invitations to Opening of Water & Sewage Treatment Plants, 9 March 1967. Archives Central, MDC 00005:76:94/1.

Borthwicks freezing works in Feilding was the first to be prosecuted under the Water Pollutions Act regulations 1963.[896] Regulation of discharge to waterways was further strengthened by passage of the Water and Soil Conservation Act which made it an offence to discharge any waste into waterways unless expressly consented by way of permit.[897]

While the Feilding sewage treatment plant removed gross pollution from the Oroua River from the late 1960s via its primary treatment processes, it was not removing the less visible pollutants which were more harmful – fine suspended solids and oxygen-depleting substances. Point-source discharges from dairy factories resulted in the death of fish en masse in the Tokomaru and Manawatū rivers in the late 1970s and early 1980s. In response the Manawatū Catchment Board required all major dischargers of effluent to upgrade their treatment plants to include secondary treatment that would remove these pollutants.[898]

After 1970 both the abattoir and the wool-scourers extended their operations to 24 hours per day, and further industries were established including Watties Frozen Foods and an export meat packing plants in the late 1970s – substantially increasing the loading on the sewage treatment plant.[899] Unsurprisingly then, the late 1970s-early 1980s had also seen the Feilding Borough Council under increased pressure from the Manawatū Catchment Board to address the continued breach of their water right to discharge to the Oroua River – both in terms of effluent volume and the effluent failing to meet acceptable standards relating to biological oxygen demand (BOD). In May 1982, a technical committee comprising members of both the Manawatū Catchment Board and the Feilding Borough Council was set up to consider the problem.[900] It was so severe that:

> 'The Board regarded this pollution problem as the worst in its entire territory and was on the point of initiating a prosecution against the Borough Council as, in the

[896] C Knight, 2016, pp 83-85.
[897] C Knight, 2014, p 185.
[898] Ibid, pp 186-187.
[899] S Chamberlain, 1994, p 65.
[900] Minutes of a Meeting of the Technical Committee for the Feilding Borough Sewage Treatment Plant, 8 March 1982. Archives Central, MDC 00005:50:48/2.

> opinion of the Board Council, over a number of years, had shown itself to be unable – if not unwilling – to come to grips with this serious problem.'[901]

Despite the severity of the pollution and the time over which the discharge right had been breached, the Manawatū Catchment Board had not initiated prosecution and instead issued a consent which gave the council further time in which to address the problem. One solution considered by the technical committee was the diversion of the Kawa Kawa wool-scourers effluent from the borough's treatment system and instead irrigate it to land (alongside the Oroua River), which by the end of 1982 had reduced breaches of the water right to 'only' from time to time on an hourly basis.[902] The committee also gave consideration to the fact that, as local industries continued to expand, so too would the effluent loading on the plant, leading them to consider the addition of secondary treatment.[903] This work was completed and operational by the mid-1980s.[904] The Feilding Borough Council had also passed a trade waste bylaw in 1983, but it was largely ineffective as the fuller costs of polluting the river were not passed onto the industry polluters. It effectively remained less costly for them to continue to pollute the river than consider and invest in alternatives.[905]

Even with secondary treatment, effluent from the sewage plant remained contaminated with bacteria and nutrients causing algal blooms and other unwanted plant growth and which, in turn, affected the water quality of the Oroua River and its ability to sustain aquatic life.[906] The intensification of dairying, that began to grow exponentially in the catchment from the 1990s, was contributing significantly increased levels of bacteria and nutrients to the river via diffuse discharges such as farm run-off containing animal urine and fertilisers. Added to this load on the river was also the industrial effluent discharged

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901 Feilding Borough Council-Manawatū Catchment Board, Joint Technical Committee, Progress Report to November 1982, 6 December 1982. Archives Central, MDC 00005:50:48/2.

902 Sub-committee to the Technical Committee, Meeting Minutes, 10 November 1982. Archives Central, MDC 00005:50:48/2.

903 Feilding Borough Council-Manawatū Catchment Board, Joint Technical Committee, Progress Report to November 1982, 6 December 1982. Archives Central, MDC 00005:50:48/2.

904 Harrison Grierson Consultants Ltd, letter to the Feilding Borough Council, 2 February 1984. Archives Central, MDC 00005:50:48/2; and Report of the Borough Engineer to the Works & Services Committee, Feilding Borough Council, 29 October 1986. Archives Central, MDC 00005:50:48/2.

905 S Chamberlain, 1994, pp 67-71.

906 C Knight, 2014, p 189.

independently of the Feilding sewage treatment plan, and seepage from dysfunctional septic tanks.[907]

Following passage of the Resource Management Act 1991, the scope of councils to manage discharges to waterways was extended to encompass the ability to control and regulate land use. In 1993, the Manawatū Wanganui Regional Council released a regional policy statement that proposed to stage in discharge restrictions, in times of low-flow, over a 15 year period to improve water quality to meet contact recreation standards.[908] As with the proposal to introduce restrictions on water allocation from the Oroua River, a battle played out between the economic interests of the polluters (district councils, farmers, and industry) and the 'impractical', 'unaffordable', and 'unreasonable' interests of environmentalists and recreation users. As also with the policy on water allocation, the battle played out largely in isolation; and again the customary use relationship and interests of Ngāti Kauwhata in the Oroua River were marginalised and their rights to be centre-stage in the policy development process ignored.[909]

In 2003, the newly named Horizons Regional Council sought to develop a singular plan for the management of the regions resources, including water, and proposed further restrictions on discharge to waterways in line with the RMA also to be staged in over time. These and other restrictions were strongly opposed by the agricultural and horticultural industries all the way to an Environment Court ruling in favour of the council in 2012.[910] The final One Plan was released in 2014.[911] While Horizons' and their One Plan have been lauded for 'being ground-breaking' in the setting of stronger environmental protection standards,[912] they did not set any new standards for the recognition of Māori customary use rights and interests or engaging with hapū and iwi in ways that respect their tino rangatiratanga over their taonga.

In 2012, the Manawatū District Council applied to Horizons for a renewed 35 year consent to discharge from the Feilding sewage treatment plant into the Oroua River. At

907 Ibid, pp 189-190.
908 Manawatū-Wanganui Regional Council, *Proposed Regional Policy Statement for Manawatū-Wanganui* (Palmerston North: Manawatū-Wanganui Regional Council, 1993).
909 DB Emery, Affidavit to the Waitangi Tribunal for the National Freshwater and Geothermal Resource Inquiry, Wai 2358, 2 September 2016.
910 Ibid, pp 224-227.
911 Horizons Regional Council, 2014.
912 C Knight, 2014, p 227.

the consent hearing in January 2015, Ngāti Kauwhata took the opportunity to voice their long-standing opposition to the discharge of human effluent into their ancestral river, indeed any discharge of effluent, and to give evidence in support of a discharge-to-land scheme.

In an affidavit to the Waitangi Tribunal in their consideration of the National Freshwater and Geothermal Resources Inquiry, Ngāti Kauwhata kaumatua Dennis Emery reflected on the process used at the consent hearing and of the council's (continued) failure to recognise their mana whenua status:

> 'The current provisions for Māori to have a say in how water is managed, as a resource, and for the maintenance of environmental standards, fall well short of what is required to give fair expression to our customary and unalienated rights of ownership…. We were just one competing interest along with several others, and while we had a fair hearing in that context, the problem for me was that it was not the right context. This is our river, just as much as it is now the river for the general public. On that basis, the cultural impact assessment was made on the assumption that all I had was a cultural interest. In terms of the Treaty, I considered the report should have proceeded on the basis that I was a part-owner. In the same way, I thought I should be sitting with the person who was making the decision; me for Ngāti Kauwhata, and he or she for the general public.'[913]

Horizons Regional Council granted consent to the Manawatū District Council to discharge into the river but for a reduced 10 year period. Horizons said the decision was consistent with the One Plan in that the short consent time would give the council time to upgrade the plant and further investigate discharge-to-land. This was despite the fact the Manawatū District Council had been operating for many years on an expired consent which had effectively already given them a long while to make changes. Ngāti Kauwhata was hugely disappointed that the council was to be allowed to continue to pollute the river and felt the concerns they had raised at the hearing were ignored.[914] The Manawatū District Council subsequently appealed Horizons' decision in the Environment Court, requesting a 25 year consent, but it was not upheld. Instead, the court took issue with their

[913] DB Emery, Affidavit to the Waitangi Tribunal for the National Freshwater and Geothermal Resource Inquiry, Wai 2358, 2 September 2016.

[914] M Grocott, 'Fury at Wastewater Discharge Consent for Oroua River', in *Manawatū Standard*, 28 January 2015.

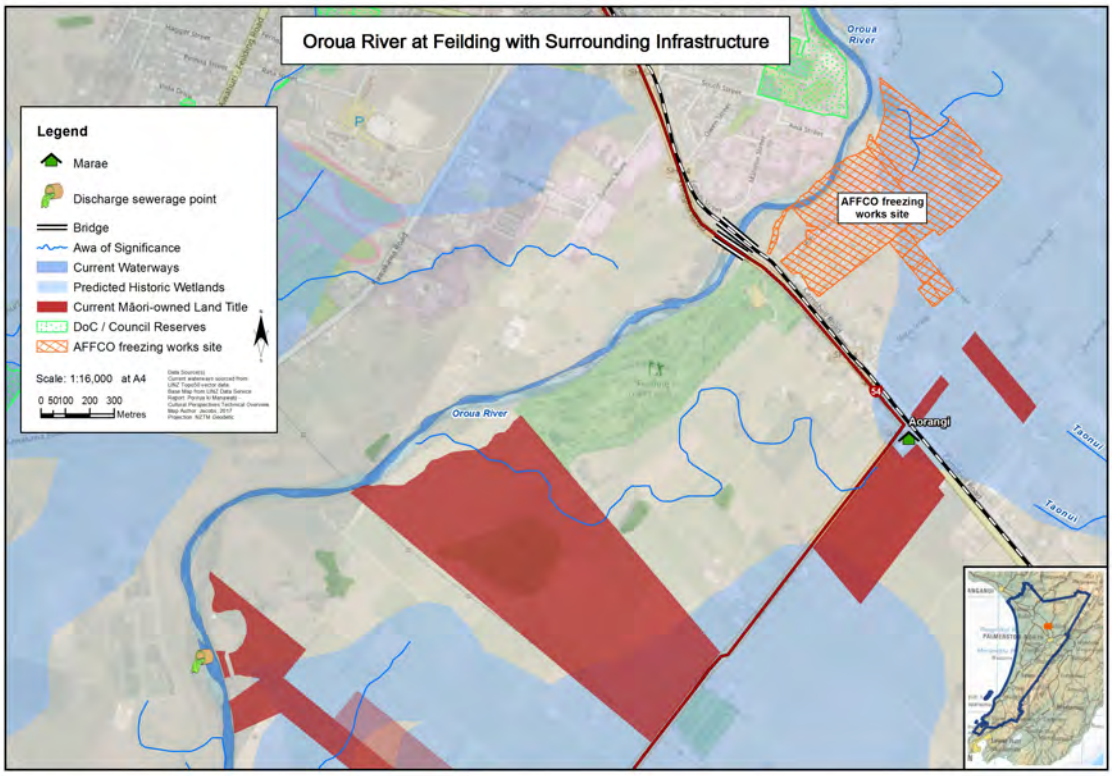
long period of non-compliance (16 years that had elapsed since the council had first been issued a short-term consent) and the fact that no obvious attempts had been made to address it.[915] While the Manawatū District Council was clearly in breach of the RMA, questions must also be asked about the regulatory failure of Horizons Regional Council to monitor consents for the 'life-affirming' wellbeing of a river that they knew was overloaded with pollutants.

Following the decision, Ngāti Kauwhata initiated talks with the Manawatū District Council to work together to create a non-binding declaration to protect the Oroua River. The Oroua River Declaration was signed on 15 December 2015 by the Mayor Margaret Kouvelis and by Sir Mason Durie on behalf of Ngāti Kauwhata. In the Oroua River Declaration both parties agreed that the mauri of the river should be protected, that they would work together by establishing a mana whakahaere group to provide oversight and advocacy for the river's ongoing management, and that a strategic plan would be developed for the river's preservation and restoration.[916] A major changing of the guard following the local body elections in October 2016 has meant, however, the need to restart relationship-building with the new council.[917]

Also in 2015, AFFCO in Feilding applied for a renewed 35 year consent from Horizons to discharge treated wastewater into the Oroua River.[918] Ngāti Kauwhata again presented at the consent hearing to restate their position that all discharges to the river were to stop and be replaced with land-based disposal. They wanted consideration given to their key customary use concerns before any long-term plans are approved, namely, that the river be made swimmable by children, that it be conducive to the return of fish life, and that it be sufficiently clean for the performance of selected rituals. They also stated they wanted to work with AFFCO and the various councils to develop a collective approach to restoring customary use of their river, such as through the development of a joint management agreement as provided for under Section 36b of the Resource Management

915 N McBride, 'Commissioners Call Out Feilding Wastewater Plant for Outdated Management', in *Manawatū Standard*, 30 March 2016.
916 Ngāti Kauwhata and Manawatū District Council, *Oroua River Declaration* (2015).
917 Personal communication, Dennis Emery, 15 March 2017.
918 Lowe Environmental Impact, *Meat Processing Plant Discharge Consents: Application and Assessment of Environmental Effects – Prepared for AFFCO New Zealand Ltd* (Palmerston North: Lowe Environmental Impact, 2015).

Act, and called for the development of a formal relationship agreement with Horizons Regional Council to agree on terms of engagement, projects, and mutual goals.[919]



Map 39: **Map of Oroua River showing AFFCO site and sewerage discharge point.**[920]

Again, Horizons issued the consent for discharge to the Oroua River, but again lessened the term for the consent – this time down to 18 years to 2029 (which includes six years to cover the non-consented period prior to the application). And yet again, questions must be asked about the regulatory failure of Horizons to enforce consents.[921] AFFCO have since advised they will appeal the decision in the Environment Court.[922]

919 DB Emery, Statement of Evidence on behalf of Nga Kaitiaki o Ngāti Kauwhata Inc, 31 October 2016.
920 Created by Jacobs, courtesy of Crown Forestry Rental Trust.
921 Manawatū-Horizons Regional Council, *Decision Report Feilding Meat Processing Plant: AFFCO New Zealand Limited's Resource Consent Application to Manawatū-Horizons Regional Council* (Palmerston North: Manawatū-Horizons Regional Council, 2017.
922 Personal communication, Dennis Emery, 15 March 2017.

4.8 Concluding Remarks

Water abstraction from rivers and streams across the inquiry district has continued to increase over the past 150 years, with the vast majority of it used for irrigation for farming and horticulture. Indeed, the demand for water has now outstripped supply in most catchments where permits for water take are over-allocated. Despite awareness that increased abstraction reduces the capacity of rivers and streams to dilute the waste discharged to it, the Crown remains committed to further increasing abstraction to further intensify and expand farming and horticulture in the inquiry district. Groundwater is increasingly being used as a water source for these developments, but is insufficiently regulated and monitored in at least some parts of the inquiry district.

Despite the passage of numerous pieces of legislation regulating both water take and the discharge of waste to waterways over the past 150 years, there has been insufficient regard for the environmental consequences on water quality and the aquatic life that rivers and streams support. Instead, Crown-authored management and regulatory regimes have consistently usurped environmental interests for the economic interests of the farming and horticultural sectors.

In particular for the purposes of this report, there has also been very little regard for the impacts of water take and discharge on the customary use of these waterways by hapū and iwi. As a result, the imposition of the Crown's regime has obliterated the waterways-based economy and way of life of hapū and iwi in the inquiry district. The Crown has clearly failed in their obligation to uphold and protect the customary use of waterways by hapū and iwi as partners to Te Tiriti o Waitangi. Instead, their interests have been continually marginalised or, at best, "taken into consideration" as one "stakeholder" interest group alongside others. Where hapū and iwi campaigns for the recognition of their customary use rights have been upheld by Crown-delegated local authorities, as detailed in the case study on the Ōtaki River, it would seem to be more a result of economic-based decision-making than any honouring of these obligations.

5: RESOURCE MANAGEMENT

5.1 Introduction

The Māori worldview has been described as demonstrating 'a philosophy of vitalism', meaning that the understanding of the universe being comprised and connected by a divine life force, underlies people's behaviour and attitudes of respect and reverence of the environment.[923] Within the Māori worldview is the concept of 'kaitiakitanga' which describes the relationship of guarding, keeping and preserving all of life that was birthed from Papatūānuku or mother earth.[924] This worldview sits in stark contrast to the philosophy demonstrated by the colonial government of Aotearoa New Zealand who use the term 'resource management' to refer to the way in which they interact the environment. The term instead implies ideas around control of something that has value based on what benefit it provides to you. This aligns with the English common law framework which is really only concerned with the allocation and protection of ownership and use rights. The shift of relationship with water being regulated by Māori customary law to English common law, meant that individual property rights tended to be protected over collective rights of whānau, hapū and iwi to guard, keep and preserve water and all life associated with it.

This chapter will provide an overview of how the Crown carried out "resource management" historically and still does today, and the contrast between these two worldviews will be further highlighted. The chapter will refer to the effects of this on the whānau, hapū and iwi of the inquiry district. However, whilst the following chapters will provide more in depth analysis of the effects of the Crown's resource management regime, this chapter will detail the mechanisms used by the Crown to assert control over natural resources, or highlight where the Crown has failed its obligation to directly protect, or allow for whānau, hapū and iwi to carry out kaitiakitanga, over the environment.

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923 M Henare, 'Pacific Region: In Search of Harmony: Indigenous Traditions of the Pacific and Ecology', in *Routledge Handbook of Religion and Ecology*, edited by W Jenkins, M Tucker, & J Grim (Routledge, 2006).

924 M Marsden, 'Kaitiakitanga: A Definitive Introduction to the Holistic World View of the Māori', in *The Woven Universe; Selected Writings of Māori Marsden*, edited by TAC Royal (The Estate of Rev Māori Marsden, 2003).

5.2 Local Government and Water Management in the Inquiry District

Resource management in Aotearoa has mostly been a function of local government.[925] Therefore, an appropriate point of departure in investigating resource management of waterways is to provide an overview of the form and function of local government in the inquiry district.

The New Zealand Constitution Act 1852 established the provinces as the first form of local government in Aotearoa. Under various ordinances by provincial councils, 21 municipal local government entities had been created by 1867. The Municipal Corporations Act 1867 was passed to regularise the existing local government entities and the process of constituting additional ones.[926] In 1876 the Counties Act abolished the provinces and introduced the counties and borough system; 314 road boards were merged into 63 counties by the time the Act was enacted. County Councils were used to govern rural areas, and Borough Councils were used to govern urban areas. There was also an intermediate municipality between a county town and a borough; that being a town district, created under the Town Boards Act of 1882.

It was one hundred years before the next major reform of local government. With the passage of the Local Government Amendment Act 1989, a new system was established. Borough and county councils were amalgamated into either district councils, or city councils if the city was large enough. 13 regional councils were also established to cover area that may include multiple district and county councils, with a separate jurisdiction over largely natural resource management regulation and matters.

Appendix VII provides a detailed overview of the very many local authorities within the inquiry district that could be found in the historical record and have had jurisdiction that relates to inland waterways.

Iwi representation and involvement in decision-making on the management of water ways has been very limited historically. The only avenue for involvement has been election of iwi members onto local government authorities and there are very few examples of this

[925] NR Wheen, 'Natural Flow - a History of Water Law in New Zealand', in *Otago Law Review* 9(1): 1997.

[926] http://www.teara.govt.nz/en/1966/government-local-government/page-6.

that were encountered in the research. The Draft Local Government Issues Report in this inquiry addresses the issues around representation in depth.[927] Councils have only recently provided for iwi involvement in local government decision-making on natural resource management on the basis of the tikanga Māori (Māori law) concept of mana whenua; iwi that occupy tribal land are recognized as holding their own form of territorial authority and therefore rights to involvement.[928]

The way in which mana whenua involvement is structured and the degree of involvement varies across the different regional, district and city councils. Any means of formally recognizing the partnership between Council and iwi is very recent in the history of the relationship. The Local Electoral Act 2001 provided for the establishment of Māori Wards that would guarantee iwi representation directly onto Council. There are no territorial authorities in the inquiry district that have established Māori wards for their Councils.

5.2.1 Regional Council Partnership Arrangements

Horizons Regional Council's 'One Plan' which consolidates their Regional Policy Statements and Regional Plan sets out how the Council approaches their Treaty Partnership with iwi in the Region. It refers to the Resource Management Act 1991 as the basis for Council's interpretation of their Treaty obligations, referencing the Act's requirement that the Regional Councils 'take into account the principles of the Treaty of Waitangi in exercising its functions and powers'. The implementation of the plan is another matter, according to the Muaūpoko Tribal Authority: 'the Regional council has been acting in breach of its own plan ever since it became operative'.[929] The Council claims it fulfils this requirement in a number of ways through the objectives and policies in the Plan.[930]

The key objectives and policy in the Plan that enable to Council to take the principles of the Treaty of Waitangi in the Plan are as follows:

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927 S Woodley, *Draft Local Government Report* (Wellington: Crown Forestry Rental Trust, 2017).

928 M Bargh, 'Opportunities and Complexities for Māori and Mana Whenua Representation in Local Government', in *Political Science* 68(2): 2016, pp 143-60.

929 Personal communication, Emma Whiley of Bennion Law on behalf of Wai claimants Muaūpoko Tribal Authority, email received during the Draft Report feedback stage, 20 June 2017.

930 Horizons Regional Council, *One Plan: The Consolidated Regional Policy Statement, Regional Plan and Regional Coastal Plan for the Manawatū-Wanganui Region*, (Palmerston North: Horizons Regional Council, 2016).

Objective 2-1: Resource Management

> ‘(a) To have regard to the mauri of natural and physical resources to enable hapū and iwi to provide for their social, economic and cultural wellbeing.
>
> (b) Kaitiakitanga must be given particular regard and the relationship of hapū and iwi with their ancestral lands, waters, sites, wāhi tapu and other taonga (including wāhi tūpuna) must be recognized and provided for through resource management processes.’

The key policy to implement this objective is: Policy 2-1. It sets out specific methods of ensuring the resource consent process and wider management of catchments involves iwi and hapū. It’s not specific about the degree of influence iwi and hapū can have over decisions.

> ‘The Regional Council must enable and foster kaitiakitanga and the relationship between hapū and iwi and their ancestral lands, water, sites, wāhi tapu and other taonga through increased involvement of hapū and iwi in resource management processes including:
>
> (a) Memoranda of partnership between the Regional Council and hapū or iwi which set clear relationship and communication parameters to address resource management objectives
> (b) Recognition of existing arrangements or agreements between resource users, local authorities and hapū or iwi
> (c) Development of catchment-based forums, involving the Regional Council, hapū, iwi and other interested groups including resource users, for information sharing, planning and research
> (d) Development, where appropriate, of hapū and iwi cultural indicator monitoring programmes by the Regional Council
> (e) Assistance from the Regional Council to hapū or iwi to facilitate research projects, seminars and training
> (f) Development of joint management agreements between the Regional Council and hapū or iwi where appropriate
> (g) The Regional Council having regard to iwi management plans lodged with Council

(h) Involvement of hapū or iwi in resource consent decision-making and planning processes in the ways agreed in the memoranda of partnership and joint management agreements

(i) The Regional Council advising and encouraging resource consent applicants to consult directly with hapū or iwi where it is necessary to identify:

i. The relationship of Māori with their taonga

ii. The actual and potential adverse effects of proposed activities on those relationships.'

Claimants from Ngāti Raukawa and Ngāti Kauwhata have stated that they have no Memorandum of Partnership with Horizons Regional Council as guaranteed in the One Plan, however Horizons do hold one with the Muaūpoko Tribal Authority.[931]

Claimants have referred to the Manawatū River Leader's Accord as a key forum that they have attempted to see their partnership given expression. This was signed in 2010 by a range of iwi, hapū and marae organisations, district and regional councils, NGOs, lobby groups, companies, universities, and the Department of Conservation. The Accord is established with the goal being to improve the Manawatū River and the mauri of the catchment so that it sustains contact recreation and is 'in balance with the social, cultural and economic activities of the catchment community'.[932] However, deep analysis of the implementation of Accord has highlighted that whilst the Crown have been enthusiastic about promoting collaborating on freshwater planning, these merely includes iwi as one among multiple actors. This typically marginalizes iwi contributions and doesn't help to re-structure the colonial hierarchy where iwi do not have control over water.[933]

Several of the case studies in this chapter will demonstrate that despite having the requirement objectives and policies in the plan regarding Te Tiriti/The Treaty and agreements with iwi regarding management such as the Accord, the process by which resource consent has been granted for certain activities, particularly relating to discharges

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931 Horizons Regional Council, *Memorandum of Partnership between Muaūpoko Tribal Authority and Horizons Regional Council* (Palmerston North: Horizons Regional Council, 2014).

932 Horizons Regional Council, *Manawatū River Leaders' Accord* (Palmerston North, 2010).

933 AL Bennett, *The Good Fight: Power and the Indigenous Struggle for the Manawatū River*, Unpublished PhD Thesis in Resource and Environmental Planning, Massey University, Palmerston North, 2015.

to water, has failed to give effect to their own policy to ensure appropriate input into decision-making.

By comparison, Greater Wellington Regional Council has had a longer standing formal partnership arrangement with mana whenua. Beginning with a Charter of Understanding in 1993, this provided:

> 'for a clear understanding of the basis and ongoing conduct of the relationship between the Council and tangata whenua in the context of the Treaty of Waitangi, Te Tiriti o Waitangi and the legislation which gives functions, duties and powers to the Wellington Regional Council.'[934]

This included provisions for the function of 'Ara Tahi' as a forum for representatives of each iwi in the region to provide advice to the council. It also granted iwi the right address any council committee meeting or meeting of the full council. The charter identifies the Treaty and Tiriti as the founding documents of Aotearoa New Zealand and explicitly notes that it provides for the exercise of the kawanatanga by the Crown while actively protecting te tino rangatiratanga, the full authority of the iwi in respect of their natural, physical and metaphysical resources.[935]

In 2009, "Te Ūpoko Taiao" – Natural Resource Management Committee was established, to review and develop regional plans and operative plans, and to prepare necessary plan changes. Its membership included seven councillors and seven non-councillor members appointed by council for their skills relevant to the work of the committee, and appointed with regard to the recommendation of each of the iwi authorities. The committee provides a perception that iwi have representation on the Natural Resource Management Committee, however the iwi do not have authority over who sits on the committee. Council has delegated the statutory powers to hear and decide on resource consents and to determine the nature of hearing panels to where they are required. The committee has significant authority, however there is no mechanism for accountability of non-counselor members back to any mana whenua organization.[936]

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934 Greater Wellington Regional Council, *The Charter of Understanding between Te Tangata Whenua O Te Ūpoko O Te Ika a Māui and Wellington Regional Council* (Wellington, 1993), p 3.

935 Ibid.

936 Greater Wellington Regional Council, *Te Ūpoko Taiao - Natural Resource Management Committee* (Wellington, 2009).

The Charter of Understanding was replaced by a "Memorandum of Partnership" in 2013, which describes the partnership between council and iwi and

> 'establishes a structural and operational relationship between the Council and tangata whenua, in the context of the Treaty of Waitangi, Te Tiriti o Waitangi and the legislation which gives functions, duties and powers to the Council.'[937]

The Memorandum of Partnership did little to build on the strength of the Charter of Understanding, in that Ara Tahi was still a forum to merely provide advice and Te Ūpoko Taiao remains a committee of councillors and members that iwi could only recommend, they were ultimately appointed by council.[938]

Greater Wellington Regional Council has an "Integrated Catchment Management Agreement" with Ngā Hapū o Ōtaki, the mandated iwi authority that acts on behalf of the five hapū of Ngāti Raukawa which are based in Ōtaki, over the Ōtaki River. The purpose of this specific agreement is to establish a process for a partnership between the Catchment Management Group of council and Ngā Hapū o Ōtaki in relation to operational activities that the partners intend to undertake within the Ōtaki catchment. The key objectives the agreement commits to are to develop a strategic plan to identify a common vision and shared goals and objectives, to establish a partnership group to manage the high-level relationship and operational issues and to establish an advisory group. The agreement places emphasis on the ability of hapū to have direct influence into work programs and how works will be implemented on the river.[939]

6.2.2 District Council Partnership Arrangements

Kāpiti Coast District Council formed "Te Whakaminenga o Kāpiti" in 1994 as the district council's Iwi Consultation Group. This group developed a memorandum of partnership between the three iwi and the council. The memorandum recognizes the Treaty of Waitangi signifying a partnership and the Treaty principles. The most updated version of the memorandum from 2015 is a document that recognizes the iwi and commits to building relationship through a commitment to consultation, sharing of information and

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937 Greater Wellington Regional Council, *Memorandum of Partnership between Tangata Whenua Ki Te Ūpoko O Te Ika a Māui* (Wellington: Wellington Regional Council, 2013), p 4.

938 Greater Wellington Regional Council, *Memorandum of Partnership between Tangata Whenua Ki Te Ūpoko O Te Ika a Māui* (Wellington: Wellington Regional Council, 2013).

939 Greater Wellington Regional Council, *Integrated Catchment Management Agreement; Ōtaki River* (Wellington: Wellington Regional Council, 2015).

mutual respect. There is little within the memorandum that provides for iwi rangatiratanga of natural resources.[940]

Horowhenua District Council has memorandum of partnership agreements with Muaūpoko Tribal Authority, Rangitāne o Manawatū, Ngāti Tūkorehe, and Te Kotahitanga o Te Iwi o Ngāti Wehi Wehi. It does not have a memorandum of partnership agreement with Ngāti Raukawa, despite being the most widespread iwi within the district.[941]

The Manawatū District Council does not have any memorandum of partnership agreements with iwi. In 1998, a Marae Consultative Standing Committee "Te Manu Taiko" was created with a principal purpose to liaise between Council and local tangata whenua who represent various marae within the District, as opposed to iwi authorities.[942] In 2015, the Manawatū District Council signed the "Oroua Declaration" with Ngāti Kauwhata which recognized the status of the Oroua River as a defining feature of the Manawatū District. The Declaration provided for the establishment of a "Mana Whakahaere Group" to provide oversight and advocacy for the river's ongoing management. The focus of the group will be to develop a strategic plan for the preservation and restoration of the river and foster a more integrated management approach. The Mana Whakahaere Group Terms of Reference commits the group to meet at least once a year.[943]

The many different partnership arrangements between iwi and hapū across councils vary in their intention and the degree that they provide for iwi and hapū to maintain rangatiratanga of their natural resources. This is indicative of a lack of direction from exogenous regulation, that being government legislation, policy or council planning, as to how territorial authorities should meet their obligations under Te Tiriti/The Treaty.[944] The case studies presented in this report will demonstrate that the historical and present-day resource management regime of the Crown has devolved natural resource management

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940 Kāpiti Coast District Council, *Memorandum of Partnership between Te Rūnanga O Toa Rangātira Inc, Āti Awa Ki Whakarongotai Charitable Trust, Ngā Hapū O Ōtaki* (Paraparaumu: Kāpiti Coast District Council, 2015).

941 Horowhenua District Council, *Partnerships*, 15 March 2017.

942 Manawatū District Council, *Policies for Liaising with Māori*, Manawatū District Council 2017.

943 Ngāti Kauwhata and Manawatū District Council, *Oroua Declaration* (2015).

944 PA Memon and N Kirk, 'Role of Indigenous Māori People in Collaborative Water Governance in Aotearoa/New Zealand, in *Journal of Environmental Planning and Management* 55(7): 2012, pp 941-59.

powers to territorial authorities without ensuring that the appropriate Te Tiriti/Treaty obligations are met by territorial authorities in the exercising of those powers.

With no recognition of their rangatiratanga in the regulation and devolved management of water, iwi and hapū have fought to protect their taonga by attempting to influence aspects of endogenous regulation, those being the internal ethics, principles and values which inform management. In attempting to influence those aspects of regulation, iwi and hapū have sat on consultative or advisory groups, provided cultural impact assessments stating their values and assessment of effects, they've signed accords stating their views and values of waterways, and made submissions to hearings and court proceedings. Yet the best they could hope to achieve through participation in these mechanisms provided by the Crown regime is to socialize their worldview with the territorial authority and influence broader thinking about resource management, or perhaps if they can agitate or slow process enough they may be able to leverage conditions on activities to deliver better outcomes. Political, economic and other interests that iwi and hapū hold in regards to water are ignored by territorial authorities in their exercising of decision-making or management powers, and instead iwi and hapū interests have been minimized within the regime as being merely "cultural" interests that pertain to how water is valued and what constitutes "best practice" from a cultural perspective.

5.3 Conversion of a Waterscape to a Landscape

After settlement during the mid-19th century, Māori and Pākehā settlement was limited to the coastal area of the inquiry district:

> 'A narrow strip of grassed sandhill country, of an average of some two miles in width, followed the coast line from the Manawatū to Ōtaki, and lying between that and the mountain tops was an unbroken stretch of bush. Certain clearings there were in this bush – the Weraroa clearing, and patches along the Ōhau river, where the wild horses were to be found, and those other clearings, ancient lurking places of the harassed Muaūpokos from Te Rauparaha's implacable vengeance, but they hardly broke the timber's continuity. The district, as nature intended that it should, fronted the sea-shore. From the (18)40s, the Pākehā, and for hundreds of years before that, the Māori, had stood on the beach, and looked inwards over a land which became further "back" as it receded from the shore-line. It is a point perhaps not easy to grasp now, but with the coming of the railway the whole

> centre of gravity, as it were, of the locality changed…when I knew it first, the beach was the country's "Main Trunk Line" down which the mail coaches, and all the traffic between north and south, flowed.'[945]

This section will describe how the pursuit of pastoral agriculture since the time of settlement has driven the conversion of the inquiry district from a bush clad waterscape to a landscape. This was largely facilitated through legislation that provided for local farmers and local government to establish drainage and catchment boards to carry out large drainage schemes.

> 'Māori were largely excluded from the decision making that transformed this region from a waterscape into a landscape.'[946]

5.3.1 Legislation that Provided for Conversion

The first step in conversion was the deforestation of the land; legislative support for this began in 1849 when a Crown Lands Ordinance made provisions for the Crown to introduce licences for cutting of timber on Crown Land. In 1852, when provincial governments were established, this provision extended to them. Passage of the Highways and Watercourses Diversion Act 1858 marked the beginning of a range of legislation introduced by the Crown to respond to the apparent need to drain water. The various ordinances, Acts, and amendments created by successive governments made provisions for the establishment of specialised boards to deal with specific cases. The overall approach was messy in that the boards often had overlapping functions, but their schemes were not coordinated. Instead of a planned approach at the central or even provincial government level, the approach tended to be reactive to the specific needs that may be identified by a relatively small community of ratepayers.

The first piece of legislation, the Highways and Water Act 1858, provided for the diversion and other means of controlling of water. Then in 1876, the Public Works Act was introduced, which provided for inter alia, councils to impound, divert or take water, and to widen, deepen and straighten or otherwise alter the course of water. In 1893, the Land Drainage Act was passed. This provided for the establishment of "drainage boards"

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945 RA McDonald and E O'Donnell, *Te Hekenga: Early Days in Horowhenua* (Palmerston North: GH Bennett & Co Ltd, 1929), p 3.

946 Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

which appeared to be the most instrumental in converting the landscape. This piece of legislation was amended and consolidated over time, with amendments made in 1894 and 1898. It was then repealed and replaced by the Land Drainage Act 1904. Finally, the Land Drainage Act 1908 consolidated the 1894 and 1898 Amendment Acts and the 1904 Act. The 1908 Act is still in place.

The 1908 Act enabled the Governor-General to constitute and declare a district (for the purposes of the Act) on petition from a majority of the ratepayers in any part of New Zealand.[947] A Board of Trustees was to be established for every such district.[948] The Boards were body corporates under the name of "The [district name] Drainage Board".[949] Drainage Boards are deemed to be a local authority or a local body.[950]

It is worth detailing the extensive powers provided to drainage boards as it highlights how they were able to have such a significant impact on the conversion of the landscape. Their powers are as follows:[951]

a. cleanse, repair, or otherwise maintain in a due state of efficiency any existing watercourse or outfall for water, either within or beyond the district, or any existing bank or defence against water;
b. deepen, widen, straighten, divert, or otherwise improve any existing watercourse or outfall for water, either within or beyond the district, or remove obstructions to watercourses or outfalls for water, or raise, widen, or otherwise alter any existing defence against water;
c. make any new watercourse or new outfall for water, or erect any new defence against water, or erect any machinery, or do any other act required for the drainage of the district;
d. construct any drains of such materials and in such manner as it thinks necessary or proper for carrying the purposes of the 1908 Act into execution including:
    i. breaking up the soil of any roads, ways, or footpaths within the district;

947 Section 3, 1908 Act.
948 Section 4, 1908 Act.
949 Section 13, 1908 Act.
950 Section 14, 1908 Act.
951 Section 17, 1908 Act.

ii. excavating and sinking trenches for the purpose of laying down, making, and constructing drains therein;
iii. causing such drains to communicate with the sea or any arm thereof, or with any stream or watercourse either within or beyond the district;
iv. opening, cleansing and repairing such drains, or altering the position thereof, and do all such acts, matters, and things as it deems expedient, necessary, or proper for making, amending, repairing, completing, or improving any watercourse or drain or other works to be made, done, and provided for the purposes of this Act;

e. take, purchase, and hold any lands, or any estate or interest therein, within or beyond the district, which in its opinion may be required for the purposes of this Act;
f. without any previous payment, tender, or deposit, enter upon and use any land within the district for the purpose of taking any earth, stone, clay, or material therefrom, and enter upon and use any adjacent lands for making temporary roads or approaches to any works connected with any works constructed under this Act
g. make, maintain, alter, or discontinue all such works of any kind or description, and erect such buildings and machinery within the district as it thinks proper for the purposes of this Act;
h. without any previous agreement with the owner or occupier of any land within the district, upon giving 24 hours' notice, enter upon any such land, whether the same is Crown land or not, and take levels of the same;
i. enter upon, take, and hold any land within the district for the purposes of this Act:
j. in the making, widening, deepening, cleansing, or repairing of any drain or ditch, remove the soil thereof, and place it on the bank on either side of such drain or ditch;
k. fill up or obstruct any drain;

It is significant to note that if a drainage board deemed that any land was not appropriately drained of any surface or storm water by an efficient drain that they had to right to construct a drain on that land to the nearest public water course or drain. This

power could easily be applied to much of the swamp or other types of wetland in the inquiry district.[952]

The kinds of powers vested in drainage boards were also later vested in county and borough councils (Counties Act 1886 and 1920, Public Works Act 1894, Public Works Act Compilation Act 1905). Under Part 1 of the 1908 Act, these drainage board powers could also be exercised by a local authority, to clean, repair or otherwise maintain watercourses or drains, where a local authority was not located within a drainage district constituted under the 1908 Act.[953]

The Swamp Drainage Act 1915 was introduced to provide for more large-scale drainage. This Act enabled the Governor-General to declare any area of land to be a "drainage area" (for the purposes of the Act). The Minister of Lands was then authorised to carry out such works as he thought fit for the drainage, reclamation and roading of any drainage area.

The Act provided for rates to be made and levied on the land within the drainage area, whether it was rateable property within the meaning of the Rating Act 1908 or not, except for areas of Native land used for Natives settlements not exceeding fifty acres, which were not liable to be rated under the Act. Any Native reserve or Native freehold land that was not used for settlements, or was larger than fifty acres became liable for rates under the Rating Amendment Act, 1913. Put another way, larger blocks of Māori settlement land could be taken under the Act if the Crown considered it essential for the completion of a drainage operation.

Section Seven of the Act provided that the Governor-General could take under the Public Works Act, 1908, as for public work, or purchase, any area of land within the drainage area, if the acquisition of that land was, in his opinion, necessary for the more effective carrying-out of the drainage or other works authorised by the Act, or for the "better disposal" of the Crown or other land within the drainage area.

White's Waitangi Tribunal inland waterways report found the Land Drainage and Swamp Drainage Acts to have been hugely biased towards the interests of landowners above other interested parties. Ratepayers and landowners only required a majority to establish

952 Section 23, 1908 Act.
953 Section 62, 1908 Act.

themselves as drainage boards with significant powers that were able to be exercised without consideration of impacts of changing, limiting or destroying waterbodies to the wider or neighbouring communities.

By 1941, the erosion and flooding effects of deforestation had become apparent and the Soil Conservation and Rivers Control Act was passed to address this. One of the provisions of the Act was for catchment boards to be set up on a voluntary basis. The Act provided for these Catchment Boards to manage water for land drainage and flood control purposes at national and regional levels.

There is no provision in the Acts for objections to be made by other people who would have suffered injury as a consequence of drainage works being undertaken. Under the Acts, only those who were landowners of properties where drains or other works were proposed could object to operations determined by the drainage boards. Case studies presented below will highlight how Māori interests were always likely to suffer in the face of interests from local farmers, who had a vested interest in drainage. The farming community were able to dominate decision-making on drainage boards and override other community interests. In many cases the legislation has provided for the boards to exercise powers under the Acts even on sites that were still owned by Māori.

Māori were particularly disadvantaged due to much of their collective interests in land being held in trust. Individuals were only able to claim ratepayer status and therefore influence the establishment or actions of drainage boards if they were a trustee of landowner trusts, meaning that the interests of the many beneficiaries of a trust were discounted.

The lack of recourse for drainage works that adversely affected waterways and the resources they supported, combined with the prejudice against Māori interests through the exercising of drainage legislation created the potential for the economic value of freshwater resources Māori to be overlooked in decision-making.[954] The case studies below demonstrate this by providing examples of how the legislation has been exercised and what effect they've had on Māori economies and communities in particular.

[954] B White, *Inland Waterways: Lakes* (Wellington: Waitangi Tribunal, 1998).

5.3.2 List of the Drainage Boards in the Inquiry District

The following is a list of all the drainage boards in the inquiry district. The first in the list are those that were eventually amalgamated into the Manawatū Catchment Board:

Buckley Drainage Board

The Buckley Drainage Board was set up in 1913 for an area of land west and south of the town of Shannon and from the Mangaore Stream north to the Manawatū River west and south to the Koputaroa Stream. In 1926, the boundaries of the Board were extended to include the Koputaroa basin and southwards to Whirokino and south east to the Aratangata basin. Following the creation of the Manawatū Catchment Board in 1943 the Buckley Drainage Board continued to operate, providing a close link to the farmers in the area and carrying out improvements to the river schemes. In 1959, the Board was dissolved and all functions were taken over by the Manawatū Catchment Board.[955]

Hōkio Drainage Board

The Hōkio Drainage Board was set up in 1925. The Board continued to operate after the creation of the Manawatū Catchment Board in 1943, providing a close link to the farmers in the area and carrying out maintenance to the existing drains until the Catchment Board was able to design a comprehensive scheme for the area. In 1956, the Board was dissolved and all functions were taken over by the Manawatū Catchment Board.[956]

Kuku Drainage Board

The Kuku Drainage Board was set up in 1926. The Board continued to operate after the creation of the Manawatū Catchment Board in 1943, providing a close link to the farmers in the area and carrying out maintenance to the existing drains until the Catchment Board was able to design a comprehensive scheme for the area. In 1961, the Board was dissolved and all functions were taken over by the Manawatū Catchment Board.[957]

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955 Archives Central, Buckley Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65101-buckley-drainage-board. Accessed 4 November 2016.

956 Archives Central, Hōkio Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65103-hokio-drainage-board. Accessed 4 November 2016.

957 Archives Central, Kuku Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65102-kuku-drainage-board. Accessed 2016 4 November.

Manawatū Catchment Board

The Manawatū Catchment Board was constituted in 1943, and was the first to be formed in New Zealand. It had jurisdiction over the whole of the Manawatū area, including as south as Paekākāriki. In 1987, the Board amalgamated with the Rangitikei-Wanganui Catchment Board to form the Central Districts Catchment Board. This was not legally ratified however, so the Board continued to officially exist until 1989 when it amalgamated with a number of other authorities to form the Manawatū-Wanganui Regional Council.[958]

The following Boards continued to operate after the creation of the Manawatū Catchment Board in 1943 independently, providing a close link to the farmers in the area and carrying out improvements to the river schemes initiated by the Catchment Board. In 1989, the Board amalgamated with many other authorities to form the new Regional Council.

Horseshoe Drainage Board

The Horseshoe Drainage Board was established in 1894. In November 1909, the Board amalgamated with the Sluggish River Drainage District to form the Oroua Drainage Board.[959]

Sluggish Drainage Board

The first Sluggish River Drainage Board was established in 1894 and governed the district embracing the lower portion of the watershed on the north and west of the Oroua River in the Manawatū County. It was set up to drain a large swamp in the district. The area had been partly drained before the incorporation of the Board, whose duty included completing and maintaining the system of drainage. On 18 November 1909, the Board amalgamated with the Horseshoe Drainage District to form the Oroua Drainage Board.[960]

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958 Archives Central, Manawatū Catchment Board and Regional Water Board, http://archivescentral.org.nz/agencies/topics/show/65087-Manawatū-catchment-board-and regional-water-board. Accessed 4 November 2016.

959 Archives Central, Horseshoe Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65106-horseshoe-drainage-board. Accessed 4 November 2016.

960 Archives Central, Sluggish River Drainage Board [I], http://archivescentral.org.nz/agencies/topics/show/65099-sluggish-river-drainage-board-i. Accessed 4 November 2016.

There are no records of the first Board meeting held. The Sluggish River Drainage Board [II] was incorporated by Order in Council on 19 September 1912, splitting it from the Oroua Drainage Board.[961]

Oroua Drainage Board

The Oroua Drainage District was constituted on 18 November 1909 and comprised the former Sluggish River Drainage District and the Horseshoe Drainage District. In 1912, the Drainage District separated back to previous Drainage Districts, but the name of Oroua was retained for the former Horseshoe Drainage District.[962]

Makerua Drainage Board

The Makerua Drainage District was constituted on 24 September 1906. In 1919, the Board decided to carry out a comprehensive flood protection scheme. This involved extensive banking constructions along the Manawatū River and the double banking of the Tokomaru Stream from its mouth to the Manawatū River.[963]

Mangaone River Board

The Mangaone River Board was formed in 1887 to prevent the flooding of the Mangaone River. In approximately 1896, the Mangaone River Board amalgamated with the Manawatū Land Drainage Board which took over the functions of the River Board.[964]

Aorangi Drainage Board

The Aorangi Drainage Board was constituted in 1894. On 27 June 1921, the Manawatū Land Drainage District and the Aorangi Land Drainage District united to form the Manawatū Drainage District.[965]

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961 Archives Central, Sluggish River Drainage Board [II], http://archivescentral.org.nz/agencies/topics/show/65100-sluggish-river-drainage-board-ii. Accessed 4 November 2016.

962 Archives Central, Oroua Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65098-oroua-drainage-board. Accessed 4 November 2016.

963 Archives Central, Makerua Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65094-makerua-drainage-board. Accessed 4 November 2016.

964 Archives Central, Mangaone River Board, http://archivescentral.org.nz/agencies/topics/show/65113-mangaone-river-board. Accessed 4 November 2016.

Manawatū Land Drainage Board

On 18 September 1894, the Governor General constituted the Manawatū Land Drainage Board pursuant to a petition received from the district. The district was roughly triangular in shape bounded by the Manawatū River in the south and east and the Oroua River in the west. In approximately 1896, the Mangaone River Board amalgamated with the Manawatū Land Drainage Board. On 27 June 1921, the Manawatū Land Drainage Board and the Aorangi Land Drainage Board amalgamated to form the Manawatū Drainage District.[966]

Manawatū Drainage Board

On 27 June 1921, the Manawatū Land Drainage Board and the Aorangi Drainage Board united to form the Manawatū Drainage District. The object of the merger was to create a larger and richer district to allow bigger loans to be raised for the purpose of carrying out significant drainage works.[967]

Moutoa Drainage Board

The Moutoa Drainage Board was gazetted on 23 January 1908. The Board's district comprised some 12,000 acres situated between Foxton and Shannon and was bounded on the east, south and west sides by the Manawatū River. The first major work undertaken by the Board was the construction of the Moutoa Main Drain, with a set of controlled floodgates leading eastward from the Manawatū River.[968]

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965 Archives Central, Aorangi Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65105-aorangi drainage-board. Accessed 4 November 2016.

966 Archives Central, Manawatū Land Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65095-Manawatū-land-drainage-board. Accessed 4 November 2016.

967 Archives Central, Manawatū Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65096-Manawatū-drainage-board. Accessed 4 November 2016.

968 Archives Central, Moutoa Drainage Board, http://archivescentral.org.nz/agencies/topics/show/65097-moutoa-drainage-board. Accessed 4 November 2016.

5.3.3 Case Study Fifteen: Drainage of the Taonui and Makerua Swamps[969]

Catherine Knight's environmental history of the Manawatū entitled 'Ravaged Beauty' describes the role of drainage boards in converting the lower Manawatū River flood plain from a network of wetlands and extensive estuaries that were greatly valued by Māori as a resource, to what Europeans saw as more productive use of land in the form of pasture.

In 1858, the provincial government surveyed the Upper Manawatū Block, which encompassed the future site of Palmerston North. The purchase was finalised in 1864, and the adjacent Manawatū-Rangitikei block was purchased soon after in 1866. These blocks were originally covered with dense forest and access was only provided via the river or rough bullock tracks. Clearing of the forests for the settlements of Palmerston North and Feilding then got underway in the 1870s.[970]

By 1890, the wider clearing and conversion of the Manawatū lower floodplain had begun, and in 1894, the Manawatū Land Drainage Board was formed and set about increasing drainage on the Kairanga Block. The Board's work involved the straightening and deepening of the main outlet from the Taonui swamp. The Taonui swamp is considered one of the largest pre-existing wetlands in the inquiry district and filled the basin between the Oroua and Manawatū Rivers, on the northern bank of the Manawatū River.

In order to drain the Taonui and surrounding areas, the Board dug the Burkes, Carmody's, and the Main drains. The Mangaone Stream was also diverted from a looping course into a more direct course into the Manawatū. This not only completely emptied the Taonui Swamp of its standing water, but it also dried out the soils of the whole Kairanga Block. It also effected the dense stands of flax that fringed the swamp. This had a significant effect as the flax stands were commercially cut and milled by flax mills near Shannon. Map 40 below shows the extent of the historic wetlands which effectively filled the whole basin pre-European settlement, the swamps as surveyed in 1878, and the contrast to the minimal present day waterways and network of drains that were constructed to convert the waterscape to a landscape. It shows that the standard water of the 675 hectare Taonui Swamp, 200 hectares of the Kōwhai Swamp, and 100 hectares of the Raupō Swamp have all been completely drained.

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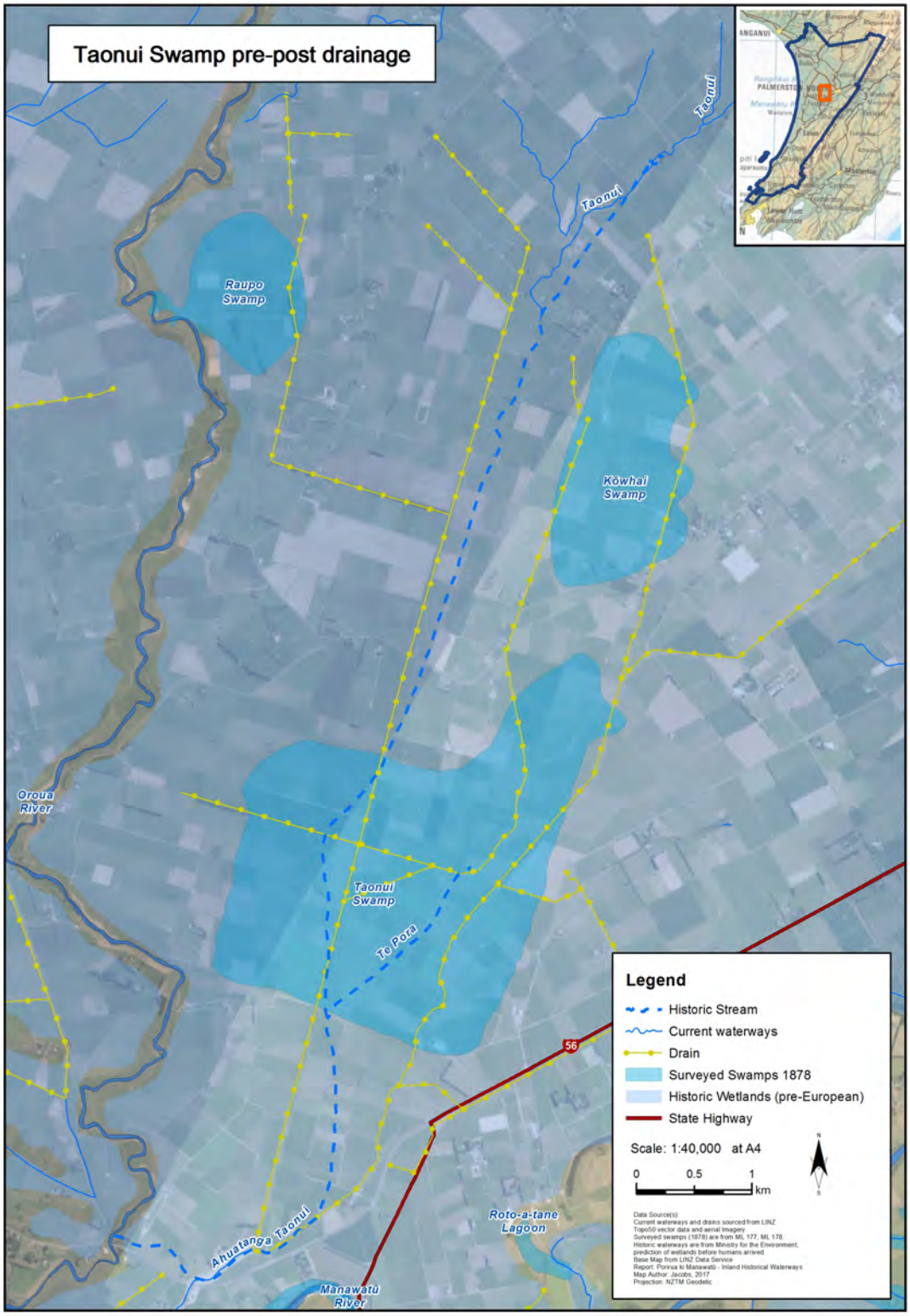
969 Claimants need to confirm correct name as it is listed as Makekerua Swamp in Adkin

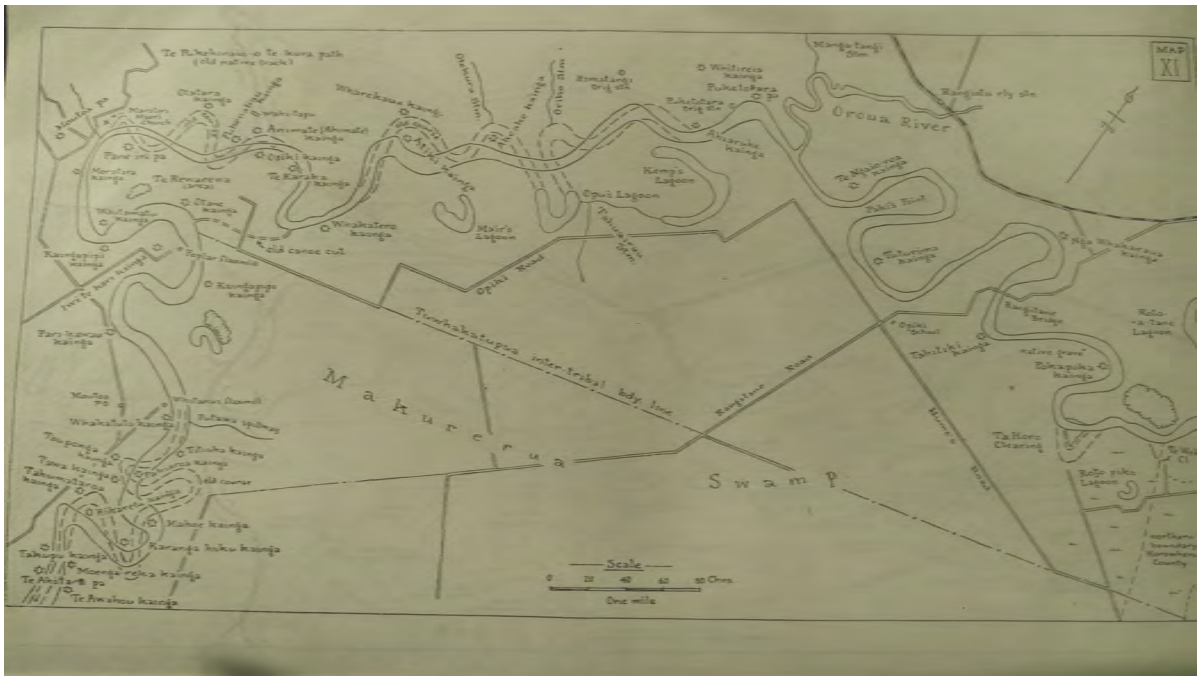
970 C Knight, *Ravaged Beauty: An Environmental History of the Manawatū* (Palmerston North: Dunmore Press, 2014).



Map 40: **Historic wetlands in pre-European times, surveyed swamps in 1878, and present day waterways and network of drains.**[971]

[971] Created by Jacobs, courtesy of Crown Forestry Rental Trust.

Naturally, the Taonui swamp area was still likely to flood and a series of different drainage regimes were applied over time to manage this and progress the total conversion of the area. Attention then turned to the large Makerua Swamp which sat opposite the Taonui Basin on south side of the Manawatū as shown in Map 41.



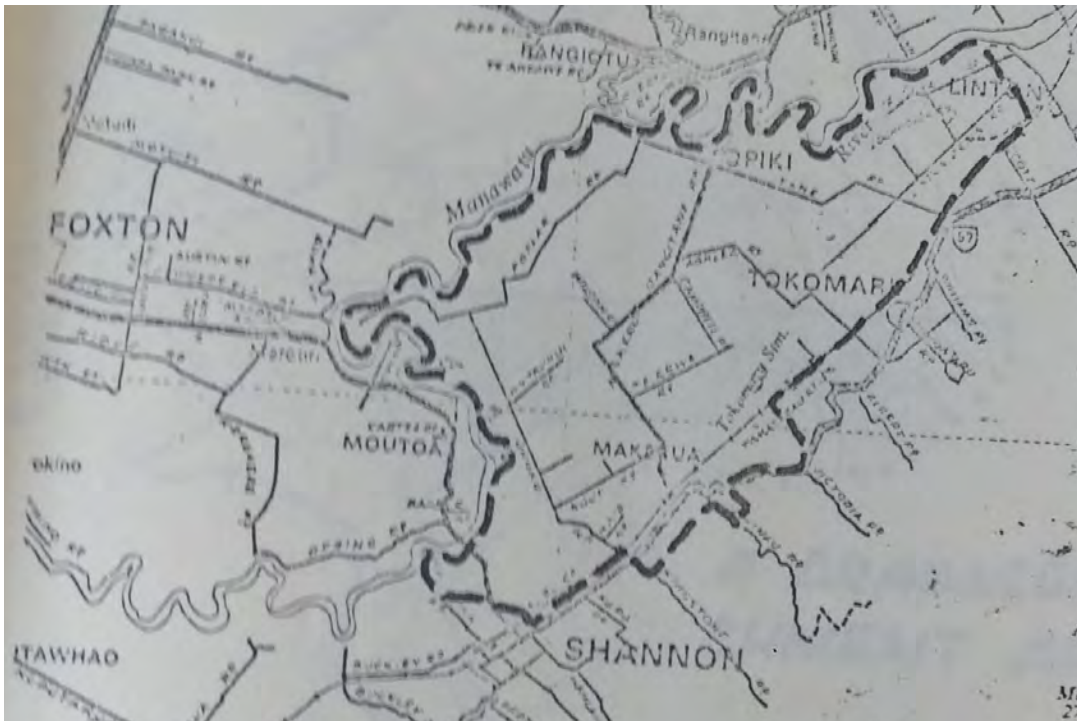
Map 41: **Makerua Swamp as mapped by Adkin with historical sites of significance.**[972]

As the Miranui Flaxmill Company could see the near end of the flax industry in the area, they joined with the Makerua Drainage Board, who held jurisdiction over the drainage district shown in Map 42, to progress the further conversion of the land to farmland. Together they funded a substantial flood protection scheme from 1919 to aid in further drainage of the swamp.[973]

By the 1920s, a so-called stopbanking 'arms race' had developed in the Manawatū. Stopbanks were used to prevent flooding, creating embankments along the river channel therefore directing water out to sea as quickly as possible, rather than allow it to replenish wetland areas. Often this was done to reclaim land from wetland to be subdivided. The effect of stopbanking in one area however, was to then move a higher volume and velocity flow of water into the neighbouring area downstream, which would give cause

[972] GL Adkin, *Horowhenua: Its Māori Place Names and Their Topographic and Historical Background* (Wellington: Department of Internal Affairs, 1948).
[973] C Knight, 2014, p 134.

for those landowners to erect their own stopbank, and so on. There were also accounts of neighbours cutting holes in each other's stopbanks to minimize flow into their properties. By 1927, 25 kilometres of stopbanks had been erected between Linton and Shannon.[974]



Map 42: **Makerua Drainage District.**[975]

The Makerua Drainage Board continued to have management over the 8900 hectare drainage district, in partnership with the later established Manawatū Catchment Board until its amalgamation into the Horizons Regional Council in 1989. The Lower Manawatū Flood Control scheme was completed in 1964. A 1967 preliminary report on the scheme notes significant flooding events had occurred in each of the three years following the scheme's completion, flooding 1000 acres a year on average.[976] By 1978, a full review was conducted by the Makerua Drainage Board. The review describes how flooding was still occurring in the old swamp area and detailed the intensive approach required to continue to try and abate flooding in the area. In a 1976 event, flooding began ponding on 28 June, and after five days of ponding, pumps were used to take control of water levels.

974 C Knight, 2014.

975 GG Brougham, *Makerua Drainage Board Review 1968 – 1978: Proposed Pumping Improvements 1978* (Palmerston North: Makerua Drainage Board, 1978), p 3. Central Archives.

976 PRL deLeon, *Preliminary Report on Drainage Improvements in the Taonui and Lockwood Areas* (Palmerston North: Manawatū Drainage Board, 1967). Central Archives.

Two days later, gravity gates were opened to reduce ponding further. Surface flooding persisted for an additional seven days.[977]

The review noted the difficulty the Board faced in creating the range of conditions required for the different farming interests in the district, i.e. cropping farmers in the area required dry conditions, whereas dairy farmers required merely some form of water control. It also noted the change in land use within the drainage district from pasture, as a result of the introduction of more stringent hygiene standards in the dairy industry, to cropping, in particular potato cropping, which required more drainage of the district. The review concluded:

> 'No matter what the reasons are for the change in land use, it has occurred, and the Makerua Drainage Board is faced with meeting the demands for additional drainage and flood protection.'[978]

It seems that the Drainage Boards reacted directly to the demand created by the agricultural industry without any wider consideration of the risk or impacts of the works to other values, or the sustainability of the industry and required works. In the case of the 1976 flood mentioned above, despite 57 years of annual investment of local rates in the Makerua Drainage Schemes to abate flooding, the flood was significant enough that it caused the loss of $200,000 to potato farmers, which would be the equivalent to $1.6 million in 2016. The review then proposed to increase pumping capacity in the district by 31 per cent within two years at a cost of $111,320 ($864,000 in 2016), and forecasted that $500,000 ($3.6 million in 2016) would be required for a further 10-20 year future program.[979]

As shown in Map 43 below, the area drained by the Board's drainage schemes was considerable; the standing water of the Makerua Swamp surveyed in 1868 is estimated to be 6650 hectares. In the review of the drainage scheme and all supporting reports and analyses found on the Makerua Swamp area, the only cost benefit analyses conducted focused on the benefits to the farming community through prevented financial loss, and

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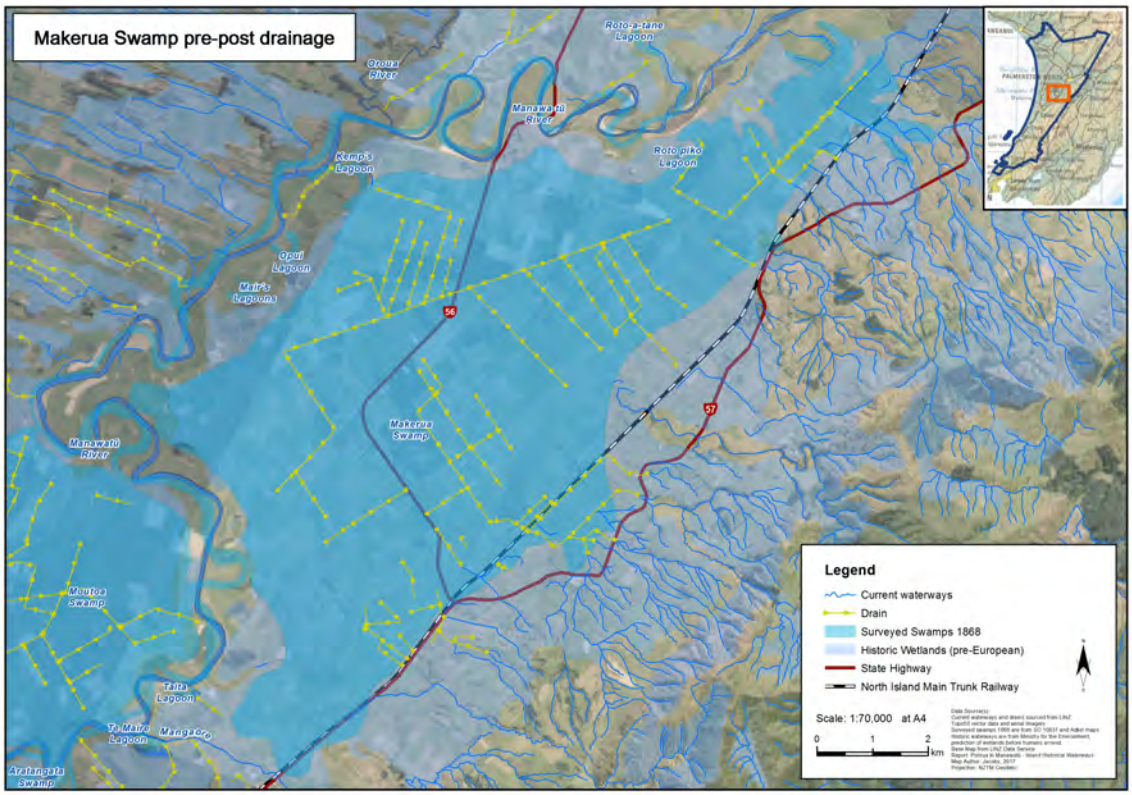
977 GG Brougham, *Makerua Drainage Board Review 1968 – 1978: Proposed Pumping Improvements 1978* (Palmerston North: Makerua Drainage Board, 1978), p 3. Central Archives.
978 Ibid.
979 Ibid, pp 16-17.

the costs to the Drainage Boards.[980] There is no analysis conducted to address if the investment in drainage is sustainable in the long term, or in the interests of the community at large. The notable absence is the Board's consideration of the conditions required to maintain and sustain the Māori economic interests in the area. There is no analysis of the effects to flora and fauna. It is clear from the total lack of reference to any Māori economic interests in the review that this was never a consideration of the Board. The Boards were clearly established and functioned to support and drive one specific economic enterprise within the region: that of conventional agriculture.



Map 43: **Makerua pre-European wetlands, surveyed swamps in 1868 and present-day waterways and drain network.**[981]

When considered as a whole, the drainage board system has functioned as an accessory of the agricultural industry. The legislation and its implementation through local government ensured that farmers could simply pay rates to establish themselves with significant powers under the law to continue to grossly modify the land and water scapes through draining extremely high volumes of water from the catchment, at great detriment to the

980 PG Evans, *Report on Flood Pumping in Taonui Basin* (Palmerston North: Manawatū Drainage Board, 1977). Central Archives.

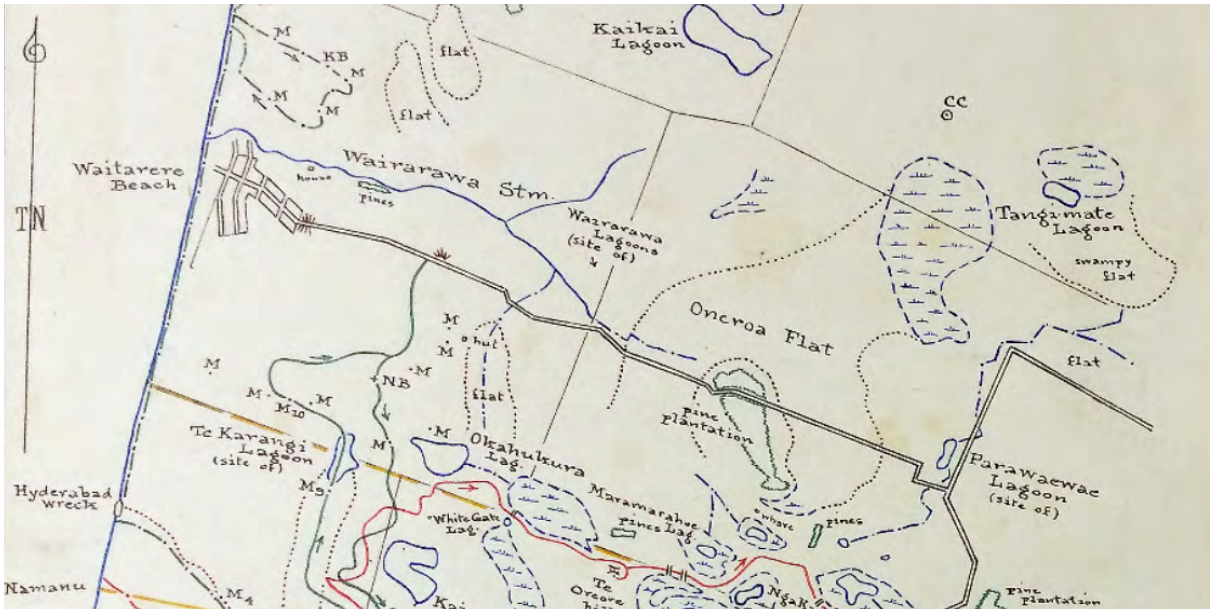
981 Created by Jacobs, courtesy of Crown Forestry Rental Trust.

ecology, and associated economic values that Māori have relied upon, and at great profit to themselves.

5.3.4 Case Study Sixteen: Drainage of Poroutawhao, including Tangimate Lagoon

Poroutawhao was once an expansive wetland area. Tangimate is referred to by Ngāti Huia ki Poroutawhao claimants as a lake or lagoon that was owned by them. It was regarded as one of the main waterways that was used to source food, and was one of the lakes in the area that supported tuna that were known to be distinctive in taste from others. Five acres at Tangimate was put into reserve by Ngāti Huia at the turn of the century which indicates the lagoon' significance to them. According to claimants, since its drainage by local government, eels only occur in those areas when there is significant rainfall.[982]

The lagoon was situated north of Waitarere Beach Rd in the rohe of Ngāti Huia ki Poroutawhao.



Map 44: **Horowhenua Dune Belt Map.**[983]

982 M Poutama, A Spinks, and L Raumati, *Porirua ki Manawatū Inquiry: Collation of Oral Narratives for Inland Waterways – Cultural Perspectives Draft Report* (Wellington: Crown Forestry Rental Trust, 2016).

983 Adkin, George Leslie, 1888-1964 :Photographs of New Zealand geology, geography, and the Māori history of Horowhenua. Ref: PA1-q-002-007. Alexander Turnbull Library, Wellington, New Zealand. /records/22348651

According to Adkin's publication *Horowhenua*, the lagoon was the property of Tamehana Te Hoia, a chief of Ngāti Huia who controlled the tuna fisheries in that area. Adkin describes Tangimate and its extensive whakamate or artificial eel-trapping channels. Whakamate channels are dug into the ground to create a flow of water that in the appropriate season tuna 'run' through, providing an opportunity for people to efficiently gather many in a short amount of time. The extensive whakamate at Tangimate lagoon as described by Adkin suggested that many people would access the eel fishery at the same run and indicates the lagoon's economic significance to Ngāti Huia ki Poroutawhao.

> 'Tangi-mate was the site of the most remarkable group of 'whakamate' or artificial eel-trapping channels known in Horowhenua. Including the largest, which is believed to be more ancient than the rest, a series of nine channels linked the lagoon with an adjacent swamp, another channel connected one lobe of the lagoon with another, and two more channels, one short, the other about seven chains in length, connected the first swamp with another one that distance farther north. This multiplicity of channels appears to have been devised to give individual owners of hīnaki (eel-baskets) equal chances of securing a catch as the eels 'ran' through with the escaping water when the impounding boards or earth-blockages were lifted or removed.'[984]

In an archaeological assessment of the site in 1983, Sheppard and Walton observed that the structure of the whakamate at Tangimate suggested that stock could be very effectively and precisely managed, where eels could be culled when required for immediate use, and retained alive for later consumption.[985]

However, according to Adkin the lagoon had been drained not long before the date of publication (1948) preventing its use as a whakamate:

> 'recent drainage operations have caused Tangi-mate to dry up and almost completely disappear insofar as open water is concerned although its basin is still fairly well defined; in its original state it was a deep lagoon, deep water coming up

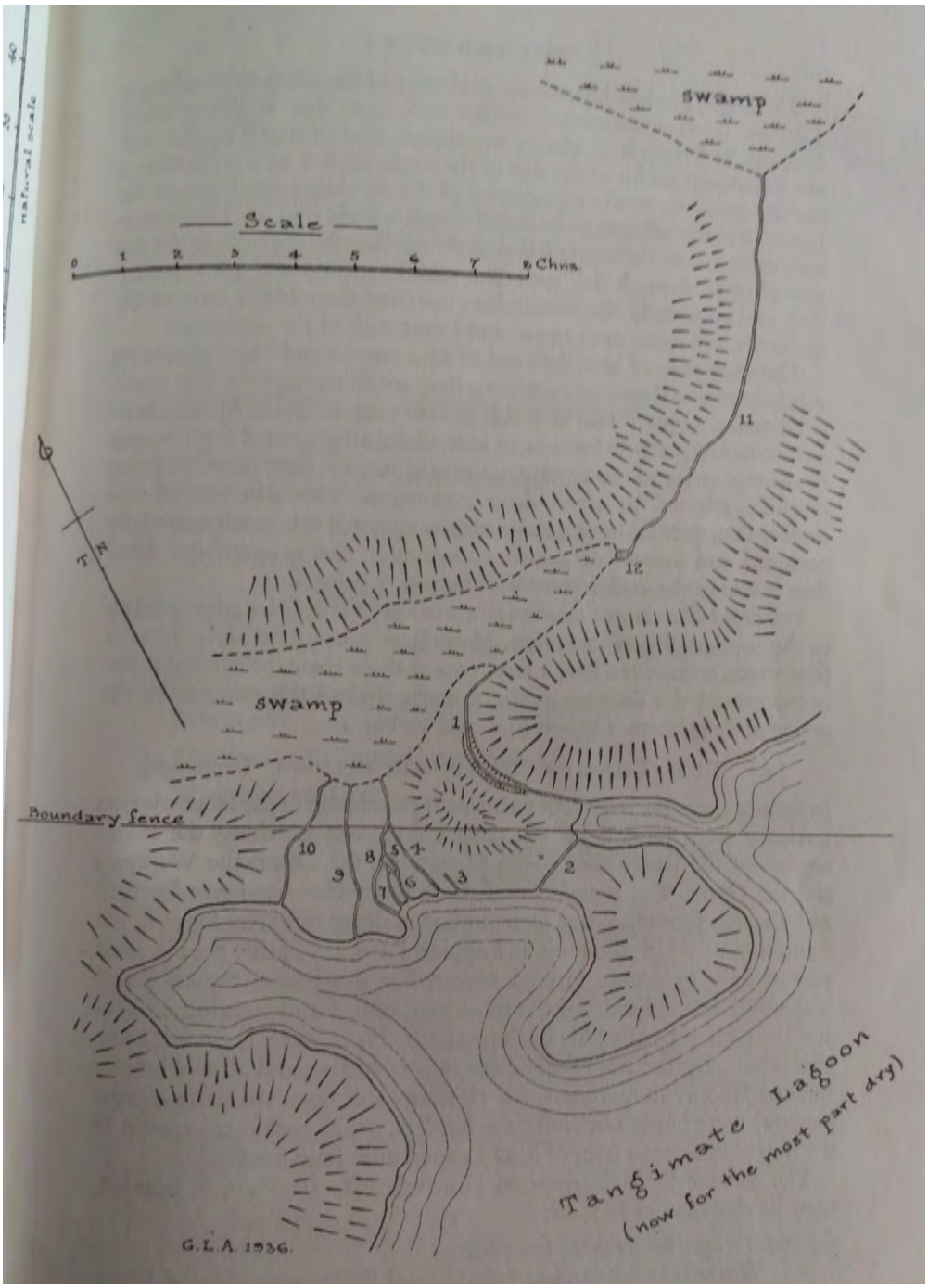
[984] GL Adkin, 1948.
[985] B Sheppard and T Walton, 'Eel-Trapping Channels at Tangimate Lagoon, Horowhenua', in *New Zealand Archaeological Association Newsletter* 26(2), 1983, pp 137-144.

to a clean-cut shore-line in most places except on its eastern side where it was bordered with swamp.'[986]

These works would have been conducted by the Manawatū Catchment Board who had been established in 1943. No specific records of this drainage scheme have been uncovered by the research to date.

Upon reviewing various plans and aerial photos since as early as 1914, Sheppard and Walton note the long-term fluctuations of the extent of the lagoon and surrounding swamps that are assumed to reflect the fluctuations of groundwater levels. They note that water levels had recently risen and flooded adjacent land that was in pasture and as a result of this a drainage scheme had been prepared. In 1981 Manawatū Catchment Board undertook an investigation into the proposed lowering of the Tangimate Lagoon.[987]

[986] GL Adkin, 1948.
[987] B Sheppard and T Walton, pp 137-144.

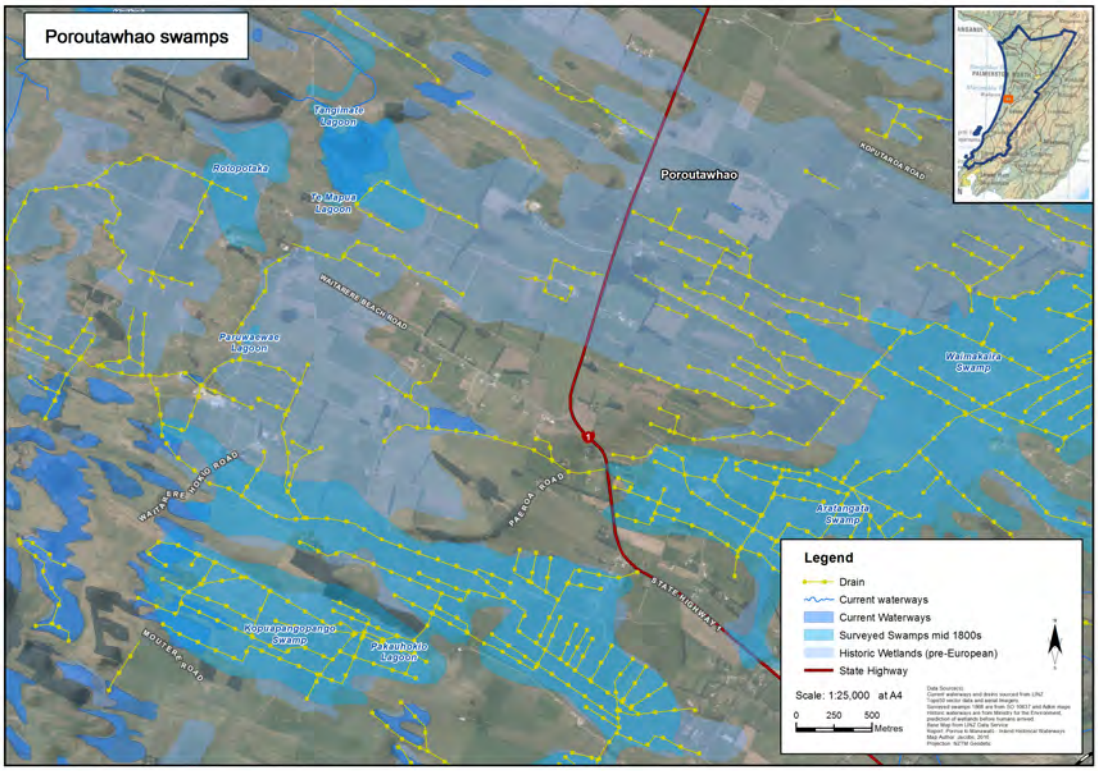


Map 45: **Multiple whakamate at Tangimate Lagoon.**[988]

[988] Adkin, George Leslie, 1888-1964 :Photographs of New Zealand geology, geography, and the Māori history of Horowhenua. Ref: PA1-q-002-007. Alexander Turnbull Library, Wellington, New Zealand. /records/22348651

The resultant change from a waterscape to a landscape is illustrated in Map 46 below showing the widespread drainage that has occurred in the complex of wetlands and lakes that Tangimate lagoon is a part of. The map illustrates the drainage of the following:

Waterway	*Original size (approx.)*	*Percentage Drained*
Rotopotaka Lagoon and Swamp	30 ha	100% drained
Tangimate Lagoon and Swamp	35 ha	53% drained
Te Mapua Lagoon	1 ha	100% drained
Paruwaewae Lagoon	1 ha	100% drained
Maiaua/Kopuapangopango Swamp and Pakauhokio Lagoon	320 ha	92% drained
Aratangata and Waimakaira Swamps	1515 ha	100% drained



Map 46: **Poroutawhao, showing extent of wetlands pre-European settlement, surveyed swamps in mid 1800s and present day waterways and drainage network.**[989]

[989] Created by Jacobs, courtesy of Crown Forestry Rental Trust.

Figure 31 is a photograph taken by Adkin in 1912 of Pakauhokio Swamp, and shows the type of habitat that was lost through the drainage schemes.

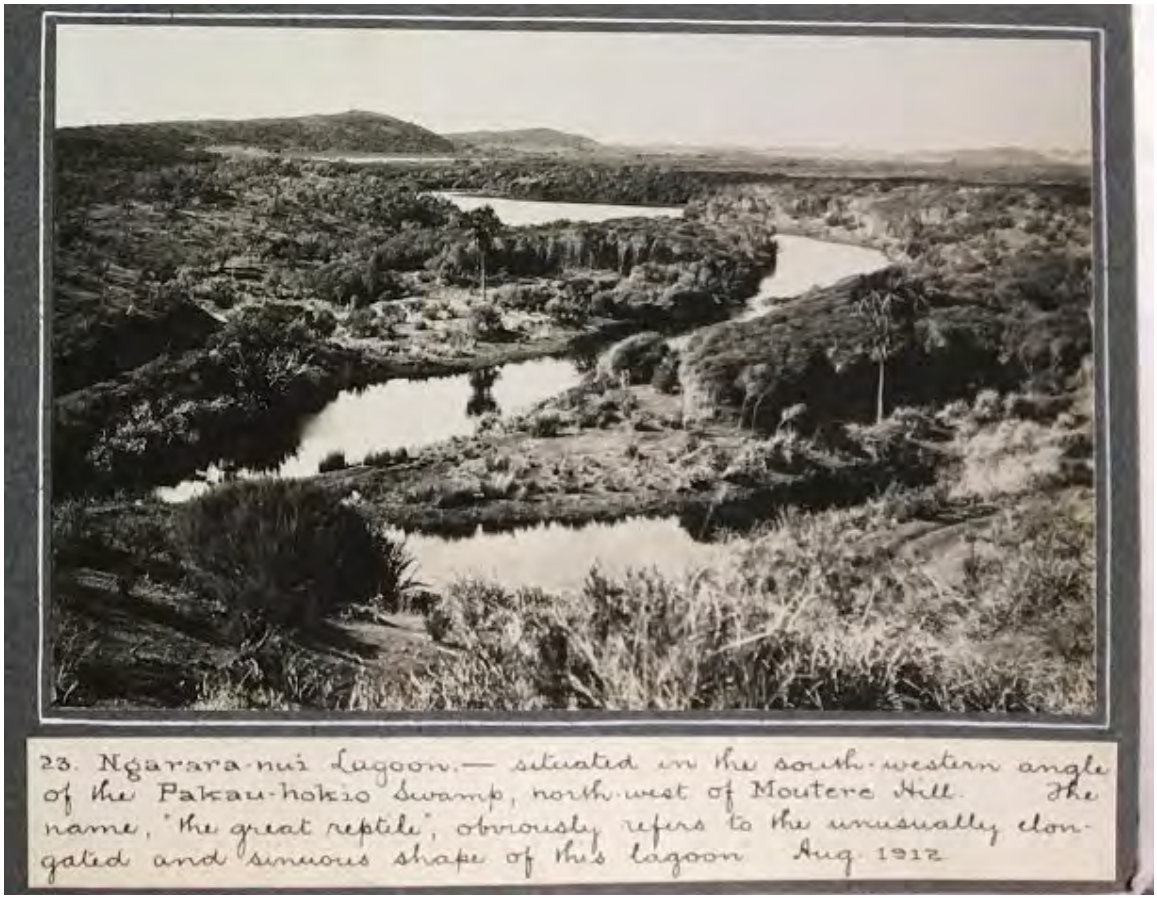


Figure 31: **Ngāraranui Lagoon, situated in 'Pakauhokio Swamp' in 1912.**[990]

5.4 Management of Discharges and the Pollution of Water

After the large-scale removal of water from the land in the Manawatū and Kāpiti areas, agricultural land use and development further impacted inland waterways through the discharge of pollutants to the limited waterways that remained. In her environmental history of the Manawatū, Knight identifies three clear phases of pollution in the Manawatū and its tributaries which are applicable to the wider inquiry district.

The first phase was characterised by solid or other visible materials, known as gross pollution, from specific discharge points such as sewage treatment plants or freezing works. This was most acute in the 1950s, and was then improved through primary treatment.

[990] Adkin Photograph Collection, Album 13, PA1-q-002.

The second phase was also from specific point sources such as factories and sewage treatment plants, but with less visible pollution. The effects of this type of pollution are still no less harmful and a key aspect of this phase is the altering of the chemical state of the waterways, particularly in terms of oxygen pollution, and this was most severe in the 1970s and 1980s.

The third phase dates from the 1990s, just as the sources of the second phase were improving, and is characterised by diffuse discharges primarily from farming. Pollution occurs in the form of excess nutrients such as nitrogen and phosphorus, affecting the ecological health of waterways.[991]

A key priority identified by claimants in the preparation of this report was to address the discharge of toxic contaminated water, soil or other materials into inland waterways.[992] This section will address the Crown's management and involvement in pollution of waterways through discharges in the inquiry district, across the three phases of water pollution outlined above.

5.4.1 Statutory Framework for the Management of Water Pollution

Pollution of water in Aotearoa New Zealand was largely unregulated until the passing of the Water Pollution Act in 1953. This provided for the establishment of the 'Pollution Advisory Council' which devised a classification for water quality and developed model by-laws for dealing with trade wastes. However, it didn't have any powers to control pollution or actively monitor it until 1963.

In 1967, the Water and Soil Conservation Act was passed which included provisions for the establishment of the Water Resources Council, which took over pollution and water quality responsibilities and worked with the regional water boards that were also established by the Act.

In 1991, the Resource Management Act was passed with the purpose 'to promote the sustainable management of natural and physical resources'. The Act made territorial authorities responsible for preventing and mitigating any adverse effects of development, subdivision or use of contaminated land. It brought together a number of earlier statutory

991 C Knight, 2014.

992 Poutama, Spinks, and Raumati, 2016.

authorities by which the Crown was empowered to exercise kawanatanga authority over water and waterways. These included the Harbours Act (first enacted in 1878), the Water-Power Act 1903, the Soil Conservation and Rivers Control Act 1941, and the Water and Soil Conservation Act 1967. This mass of statutory power was then delegated to local authorities to administer with minimal Crown supervision (at least until the first National Policy Statement on Freshwater was issued in 2011).[993]

Under the Resource Management Act, 'resource consents' are required to carry out any activity that isn't considered permitted in accordance with the objectives, policies and rules set out in national, regional and district policy statements and plans. The process by which resource consents can be gained involve applicants providing assessments of effects to territorial authorities which allows them to either grant consent, or to notify affected parties and/or the public of the application whereby a quasi-judicial hearing is held to determine if consent should be granted or not.

The Resource Management 1991 definition of "contaminant" includes:

> 'any substance (including gases, liquids, solids, and micro-organisms) or energy (excluding noise) or heat, that either by itself or in combination with the same, similar, or other substances, energy or heat -
>
> (a) When discharged into water, changes or is likely to change the physical, chemical, or biological condition of water; or
> (b) When discharged onto land or into air, changes or is likely to change the physical, chemical, or biological condition of the land or air onto or into which is discharged:'

The Hazardous Substance and New Organism Act was passed in 1996 with a purpose 'to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms.' The Act defines a 'hazardous substance' as:

> 'any substance –
>
> (a) with one or more of the following intrinsic properties…

[993] Personal communication, Emma Whiley of Bennion Law on behalf of Wai claimants Muaūpoko Tribal Authority, email received during the Draft Report feedback stage, 20 June 2017.

i. toxicity (including chronic toxicity)
ii. ecotoxicity, with or without bioaccumulation'

Applications for the introduction and use of hazardous substances are regulated under the provisions of this Act.

For the purpose of this report, the definition of toxic contamination is limited to chemicals or contaminants which adversely affect biological or human systems. Toxic contaminants contribute a major stress to inland waterways; within the inquiry district these discharges have resulted from a range of different sources, including but not limited to leachate from landfills, the application of pesticides or herbicides to soil, and polluted stormwater.

It is important to note that toxic contaminants occur in various states, ecosystems and trophic levels; however, their occurrence in freshwater and the fish populations that are relied upon for the traditional Māori food economy is of particular interest for the purpose of this report. Concentrations of chemical contaminants are typically low in water as a result of their absorption onto sediments. However, sediments can act as a reservoir from which many contaminants of concern can enter the food chain. This is particularly observed in estuarine sediments where the changes in physical and chemical properties of sediments due to the transition from fresh to salt water causes flocculation and precipitation of organic matter concentrating contaminants in these sediments.

Flood and storm waters can then "re-suspend" sediments and result in the transportation of contaminants in the wider environment. Contaminants tend to enter the food chain through sediments when organisms at lower trophic levels pass large amounts of sediment through their bodies and then extract and accumulate contaminants from the sediments.

Contaminants that are stable, mobile and can be dissolved in fats are of particular concern, as they may affect aquatic organisms and be retained in their flesh for significant periods of time. These types of contaminants can then be subject to bioaccumulation i.e. the rate at which organisms accumulate these toxic contaminants from the environment is faster than the rate at which the organism is capable of metabolising them, and; biomagnification i.e. toxic contaminants increase in concentration in organisms at successively higher trophic levels due to them consuming lower trophic level organisms that have been affected by contamination.

The following is a description of the broad priority contaminant groups in New Zealand:[994]

- Persistent Organic Pollutants (POPs): These include chemicals such as DDT and PCBs. Many of the POPs are proven or suspected of being endocrine disrupting chemicals. There are several examples of POPs accumulating in different trophic levels in New Zealand, including in Hectors dolphins,[995] and of particular concern, a study that demonstrated that POPs occurred in New Zealand women's breastmilk, with certain POPs occurring in New Zealand women in the higher end of the range of overseas study results.[996] Much of the most damaging use of persistent chemicals was unregulated until the introduction of the Agricultural Chemicals Act 1959. The use of persistent chemicals then ceased by the middle of the 1970s.
- Metals: The metals that commonly occur in the natural environment due to human activities are lead, mercury, cadmium, arsenic, copper, zinc and chromium. These metals often occur as a result of leachate from landfills or from their application to land in sewage sludge.
- Polycyclic Aromatic Hydrocarbons (PAHs): These include chemicals that are released from burning coal, oil, gasoline, trash, or other organic substances. A subset of PAHs are known carcinogens.
- Pesticides/Herbicides: These are chemicals that are specifically used for their toxic effect on target organisms. Exposure to non-target organisms can cause environmental damage, typically through acute toxicity events where the compounds are present at high concentrations for relatively short periods of time. It is difficult to find information on the use of pesticides as unlike in many other countries, New Zealand does not have a system to gather detailed statistics on the use of pesticides.

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994 M Lentz, P Kennedy, P Jones, CW Hickey, G Mills, G Fisher, and C Eason. 'Review of Environmental Performance Indicators for Toxic Contaminants in the Environment – Air, Water and Land', in *Environmental Performance Indicators: Technical Paper No. 37 Toxic* (Wellington: Ministry for the Environment, 1998).

995 Ministry for the Environment, *The State of New Zealand's Environment* (Wellington: Ministry for the Environment, 1997).

996 DJ Hannah, LH Banks, SJ Buckland, EA Dye, KA Hoffman, SV Leathem, LJ Porter, and T van Maanen, 'Polychlorinated Dibenzo-P-Dioxins and Dibenzofurans in the Blood of New Zealanders', in *Organohalogen Compounds* 21, 1994, pp 277-280; and MB Bates and N Garrett, *Investigation of Organochlorine Contaminants in the Milk of New Zealand Women* (Wellington: ESR, 2001).

- Phthalates: These are ubiquitous chemicals used predominantly as plasticisers. They are known to act as endocrine disrupting chemicals, however there is little quantifiable data on their risk.
- Others (Asbestos, Substance 1080, Paper Industry Chemicals): Each of these chemicals have specific known risks to human health and/or the environment, but are now considered to be well regulated and their effects known.
- Ammonia and Nitrate: These are two key contaminants produced by agricultural land use, natural resource industries (for example meat works and dairy) and wastewater treatment plants. Nitrate is of concern in relation to groundwater and drinking water quality. Ammonia is capable of causing toxicity in surface waters. The effects of elevated levels of ammonia and nitrate as a result of agricultural land use and wastewater treatment plants are dealt with in more detail in previous sections. In this section, ammonia and nitrate that result from discharges from meat works and dairy factories will be addressed.

Councils are required to keep records of the all contaminated sites within their respective district or region. The Hazardous Activities and Industries List (HAIL) defines industries and activities that are likely to cause land contamination resulting from hazardous substance use, storage or disposal. Sites that involve industries or activities listed on the HAIL can then be identified as indicating likely contamination and are included in the Council's 'Selected Land Use Register (SLUR).[997]

The 2013 Horizons State of Environment Report identified 27 SLUR sites in their Region,[998] whilst Greater Wellington Regional Council's 2017 SLUR identified 182 SLUR sites in the Kāpiti District and 148 SLUR sites in the Porirua area.[999] These individual sites may include a number of properties identified as one 'site'. This indicates a significantly high incidence of sites that are likely to be contaminated in these areas.

The recent amendment to the Resource Management Act, the Resource Legislation Amendment Act 2017, provides for Mana Whakahono a Rohe, that of iwi participation arrangements under new sections 58L to 58U. These provisions allow an iwi to require

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997 http://www.mfe.govt.nz/land/hazardous-activities-and-industries-list-hail.

998 Horizons Regional Council. *2013 State of Environment; Horizons Regional Council* (Palmerston North: Horizons Regional Council, 2013).

999 K Pitt, *Slur Sites Kāpiti and Porirua* (Wellington: Greater Wellington Regional Council, 2017), personal communication via email.

local authorities to engage in a discussion about formalising their engagement with iwi under the Resource Management Act.[1000] However, these new provisions

> 'fall well short of the proposals from the Wai 262 Tribunal for enhanced iwi management plans and there is no proposal for a national policy statement on Māori participation in resource management processes.'[1001]

5.4.2 Human Effluent Discharges into Inland Waterways

A particularly significant contributor of toxic discharges to inland waterways in the inquiry district has been the discharge of human effluent, both treated and untreated. Since the mid to late 19th century, the provision of sewerage systems has largely been the responsibility of local government in Aotearoa. The Municipal Corporations Act 1867 gave municipal corporations (mainly borough councils) a range of powers relating to the provision of sewerage systems. The 1908 version of the Act then provided councils further powers relating to the discharge of sewage. By this time, the Public Health Act 1872 had also provided for sewers to communicate with and be emptied into places that local boards of health deemed necessary.

From 1926, with the introduction of the Town Planning Act, councils in various forms were from then on responsible for the preparation of plans and provision of sewerage systems. In 1956, the passing of Counties Act meant that this responsibility was transferred to County Councils, and then in 1974 with the introduction of the Local Government Act, borough and county councils were demised, and their powers, including those to provide sewerage systems, was transferred to local authorities. The introduction of the Resource Management Act 1991 then enhanced the role of regional and district plans and policies to determine the rules regarding sewerage systems and the discharge of human waste. Whilst the Water and Soil Conservation Act in 1967 had provided for plans, these were indicative only, and did not provide plans with the effect in practice that was brought about through the Resource Management Act.[1002] This is reflected when reviewing the number of wastewater treatment plants that have recently converted, or are set to convert, from a discharge to water approach, to a discharge to land approach, in response to higher water quality standards required through regional plans.

[1000] Personal communication, Emma Whiley of Bennion Law on behalf of Wai claimants Muaūpoko Tribal Authority, email received during the Draft Report feedback stage, 20 June 2017.
[1001] Ibid.
[1002] NR Wheen, 1997.

Whilst there is progress as to how treated effluent is discharged, and therefore a reduction of the impact to waterways, there is still significant concern regarding the effects of wastewater on groundwater resources. Horizons Regional Council state of environment reporting noted that since 2005, seven of the regularly sampled bores in the Region breached national drinking water standards for *E.coli* on one or more occasions. The majority of these breaches were associated to contamination from waste disposal activities.[1003] Similarly, the Wellington Regional Council has indicated in its State of Environment reporting that there is evidence of the effects of wastewater disposal on groundwater.[1004]

The following is a list of all the wastewater treatment in the inquiry district that summarises their age and method of wastewater treatment:

Feilding

The Feilding wastewater treatment network has parts that date back as far as 1905. The treatment plant itself was built in 1967, prior to this, sewage was treated in a large septic tank. The Manawatū District Council, who operate the plant, have initiated a project to upgrade the plant to and convert to discharge of treated wastewater to land, instead of into the Oroua River.[1005]

Palmerston North

In 1879, the Palmerston North borough council created a ten acre 'sanitary reserve' for the burial of sewage, which eventually had to be replaced by a proper sewerage system which was initiated in 1890. At this time raw sewage was discharged directly into the Manawatū River. It wasn't until the bubonic plague scare in 1900 that the Department of Health insisted on treatment of sewage. By 1905, septic tank and filter bed treated sewage was discharged directly into the Manawatū River, and then later diverted to the Mangaone Stream which fed the Manawatū River. Despite significant concerns regarding the pollution of the River from the discharges throughout the 1930s-60s, it wasn't until 1968

[1003] Horizons Regional Council. *2013 State of Environment; Horizons Regional Council* (Palmerston North: Horizons Regional Council, 2013).
[1004] S Tidswell, C Conwell, and JR Milne, *Groundwater Quality in the Wellington Region* (Wellington, 2012).
[1005] http://www.mdc.govt.nz/Services_Information/Council_Projects/Infrastructure/Feilding_Waste_Water_Treatment_Plant_Upgrade.

that a new treatment plant was opened. With the increase of water quality standards that arose through the implementation of the Resource Management Act, further upgrading of the plant was required to gain renewed consent in 2006. The Palmerston North City Council decided against a discharge to land system, instead opting to improve the treatment of the wastewater somewhat, but continue to discharge it to the Manawatū River.[1006]

Ashhurst oxidation pond

This is located in Ashhurst and treats wastewater from a small suburb before it is discharged into the Manawatū River.

Tokomaru

The Horowhenua District Council owns and operates this wastewater treatment plant which consists of a single oxidation pond and a wetland. It services the Tokomaru Township. Effluent from the plant is discharged to both 'land' via the floor of the wetland, and in high flows to the Centre Drain. The plant has consent to discharge wastewater from the wetland to a surface water body which is due to expire on 24 January 2017. The Horowhenua District Council has applied to renew these consents.[1007]

Foxton

This wastewater treatment plant (WWTP) at Matakarapa has serviced Foxton's wastewater needs since 1974. Since its establishment it has directly discharged treated wastewater into the 'Foxton Loop', and already degraded water body that is in close proximity to the Manawatū Estuary. Consent for this discharge has expired as of 1 December 2014, however the Horowhenua District Council has retained the right to continue the discharge whilst they apply for a new consent for the WWTP that will begin to implement a land based discharge system.[1008]

[1006] https://envirohistorynz.com/2010/05/28/the-tale-of-poo-city/.

[1007] Horowhenua District Council, *Tokomaru Waste Water Treatment Plant Discharge Consent Renewal; Tokomaru Waste Water Treatment Plant Discharge Consent Application and Assessment of Environmental Effects* (Levin: Horowhenua District Council, 2016).

[1008] Horowhenua District Council *Foxton Wastewater Discharge - Resource Consent Application* (Levin: Horowhenua District Council, 2015).

Shannon

The Horowhenua District Council operates this wastewater treatment plant which originally had consent to discharge 3000 cubic metres of treated sewage into the Ōtauru Stream, which is then piped into the Mangaore Stream, and is then received by the Manawatū River. The system was eventually deemed to be non-compliant. The Horowhenua District Council is currently upgrading the new wastewater treatment system that will see 80 per cent of the treated wastewater spread on to land. However, the land that has been selected is a highly significant site for Ngāti Whakatere, the hapū based at Poutu marae in Shannon. [1009]

Levin

The Levin wastewater treatment plant (WWTP) had been discharging treated wastewater into Lake Horowhenua, contributing to the significantly high toxicity of the lake. Since then, the WWTP has been relocated away from the Lake and a man-made storage lake has been used instead. Here the treated effluent is disposed of onto the land.[1010]

Ōtaki

Ōtaki wastewater treatment plant was the first in the inquiry district to introduce a discharge to land approach to management of wastewater. There are no discharges to surface water. The plant had its last significant upgrade in 1997.[1011]

Paraparaumu

This wastewater treatment plant was commissioned in 1980, with significant upgrades having occurred in 1994, and 2001. The treated wastewater is discharged into the Mazengarb Stream, the receiving body of which is the Waikanae Estuary and River mouth. Greater Wellington Regional Council identifies discharges of treated municipal sewage (wastewater) as having the greatest impact to water quality and ecosystem health of all discharges to surface water. On the Kāpiti Coast, a population of over 40,000 in

[1009] http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11590592
[1010] http://www.hawkins.co.nz/projects/levin-wastewater-treatment-plant
[1011] http://www.kapiticoast.govt.nz/contentassets/237640c64ffb4103bd7ae9d5bf5e1fcd/overview---Ōtaki-wwtp.pdf.

Paraparaumu, Waikanae and Raumati are all serviced by the Paraparaumu wastewater treatment plant.[1012]

Porirua

Prior to the WWTP at Porirua being established. Raw wastewater was discharged directly into the sea at Titahi Bay. This meant that raw sewage was floating in the recreational swimming area of Titahi Bay. In 1990 the more recent facility was commissioned and there is no longer raw wastewater found at Titahi Bay Beach. At this facility wastewater is converted to a dry waste product and deposited at a landfill with domestic waste.[1013]

Smaller suburbs such as Bunnythorpe and Longburn, until recently discharged treated wastewater to the Manawatū after treatment in oxidation ponds. Since 2014 however, wastewater was directed to the much larger Palmerstone North wastewater treatment plant to provide better treatment of discharges and a single discharge point within the Palmerston North territorial authority area.[1014] Horowhenua District Council also runs the Mangaore, Foxton Beach and Waiterere Beach wastewater treatment plants, however, very little information on these could be found.

5.4.3 Case Study Seventeen: Wastewater Discharges at Foxton and Matakarapa

The Manawatū River catchment has been occupied by the Patukohuru (Ngāti Ngārongo), Ngāti Takihiku, Ngāti Hinemata, Ngāti Rākau, Ngāti Tūranga, Ngāti Te Au, and Ngāti Whakatere since after the battle of Haowhenua in 1834.[1015] Ihakara Tukumaru was one of the rangatira that was gifted land on the lower Manawatū River by Te Rauparaha.[1016] Ihakara Tukumaru occupied the Awahou Block in 1835 with his hapū Patukohuru and had claim to the eels in in the lagoons on the block and in the Manawatū River. By the 1840s, Awahou (today known as Foxton) was established as a major settlement on the lower Manawatū River, and the access to fishing was seen as an advantage of the location. In 1858, Ihakara Tukumaru led the sale of the Awahou Block, and the people of

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[1012] A Perrie and JR Milne, *Lake Water Quality and Ecology in the Wellington Region* (Wellington: Greater Wellington Regional Council, 2012).

[1013] http://www.pcc.govt.nz/A-Z-Services/Wastewater-Treatment-Facility.

[1014] http://www.pncc.govt.nz/yourcouncil/projects-and-initiatives/completedprojects/longburn-residential-wastewater/; http://www.confer.co.nz/tiwf/index_htm_files/Mike%20Sahayam%20%20Palmerston%20North.pdf.

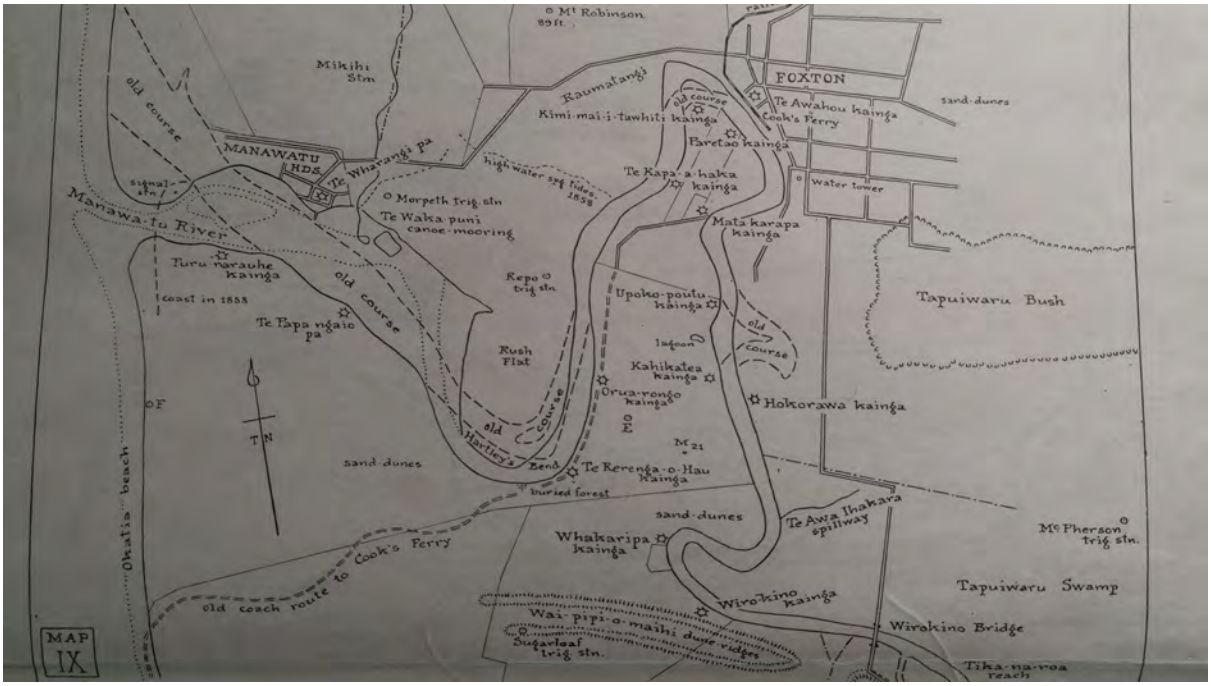
[1015] DT Kahotea, Statement of Summary of Evidence that will be presented January 2016 for Archaeological and Cultural Issues 6 November 2016, Environment Court, ENV-2016-WLG-000026, p 2.

[1016] Hana, Te. "Ōtaki Minute Book 46." Ōtaki. 352.

the Awahou settlement moved to the Matakarapa peninsula that sat directly opposite Awakou, in the narrow bend of the lower Manawatū River, referred to as 'the loop'. A wharenui was built at Matakarapa in 1864 and a church in 1877, establishing it as an important location for Ngāti Raukawa hapū that were residents in the wider area. Ngāti Raukawa burial grounds were also located there; not all were identified or surveyed under the Native Land Act, but Rerengaohau No 3 and Whirokino No 3 were two urupā that were identified and surveyed.[1017]

From the 1840s, European settlers had started to purchase flax fibre from local Māori to spin into cordage which was sold in Wellington or exported to Australia. As the industry drew the attention of more European settlers as having good economic potential, the first flaxmills were established on the banks of the Manawatū River in 1869.[1018] In 1880, the coastal route was planned to cut inland to the eastern edge of Matakarapa to the Foxton ferry (referred to as Cook's Ferry in Map 47). Ihakara Tukumaru and others set a determined amount for compensation which was declined by the County Council and Ihakara threatened to set up a toll and turn away any surveyors. The County in turn threatened the Māori landowners with prosecution and fines.[1019] Ihakara took a toll for a period of time at his house at Te Rerenga o Hau. He died in 1881.[1020]

[1017] DT Kahotea, pp 2-3.
[1018] Anonymous, 'Foxton 1888-1988 - the Borough - the First Fifty Years', in Kete Horowhenua 2013. Web. 24 March 2017.
[1019] Anonymous, 'The Road to the Beach', in *Manawatū* Herald, 20 April 1880.
[1020] DT Kahotea, pp 4-5.



Map 47: **Map of Awahou (Foxton) and Matakarapa peninsula.**[1021]

By 1888, a shortage of manila fibre and demand for binder twine in the United States of America triggered a boom in the flax industry and established Foxton as a 'flax town'. By December 1889 there were 50 flax mills within a ten mile radius of Foxton. The boom didn't last long however and by October 1890 only six mills were still at work. Another boom began in 1899 due to disruption to exports from Manila and two mills were built on the left bank of the river at Wirokino/Whirokino. Another four new mills were established by 1899 in Harbour Street, adjacent the Manawatū River in Foxton.[1022] With the growth of the Foxton township, came the need for the introduction of a septic tank system in 1907.[1023] The industry and developing town both started to put pressure on the lower Manawatū River loop as waste products from all the mills, and effluent from septic tanks were being discharged into the Manawatū River loop.[1024] It was reported by the Flax Industry Committee that 'there are no less than eight tons of refuse from every nine tons of refuse from every nine tons of green flax.'[1025]

[1021] GL Adkin, 1948.
[1022] Anonymous, 'Foxton 1888-1988 - Flax Town', Kete Horowhenua 2012. Web. 24 March 2017.
[1023] Anonymous, 'Foxton 1888-1988 - the Borough - the First Fifty Years', Kete Horowhenua 2013. Web. 24 March 2017.
[1024] DT Kahotea, p 6.
[1025] Anonymous, 'The Flax Industry; Big Interests in Jeapardy', in *Manawatū Herald*, 2 September 1919.

Foxton reached its peak as a flax town during the First World War due to the military demand for cordage. In the four years between April 1915 and April 1919 a total of 166,000 bales of fibre was passed through grading stores in Foxton (equivalent to 33,200 tonnes). Most of this fibre was produced by the 11 flaxmills situated within the Borough of Foxton, eight of which were located on the riverbank. Figure 32 shows the number of Flaxmills in Foxton from 1869 to 1974.

Lifespan of flaxmills in Foxton Borough:

1. 1869-1873
2. 1888
3. 1888-1896
4. 1889-1896
5. 1890-1898
6. 1890-1938
7. 1891-1908
8. 1896-1897
9. 1898-1920
10. 1899-1940
11. 1899-1920
12. 1899-1931
13. 1902-1931
14. 1906-1940
15. 1909-1919
16. 1910-1940
17. 1910-1922
18. 1916-1948
19. 1948-1974

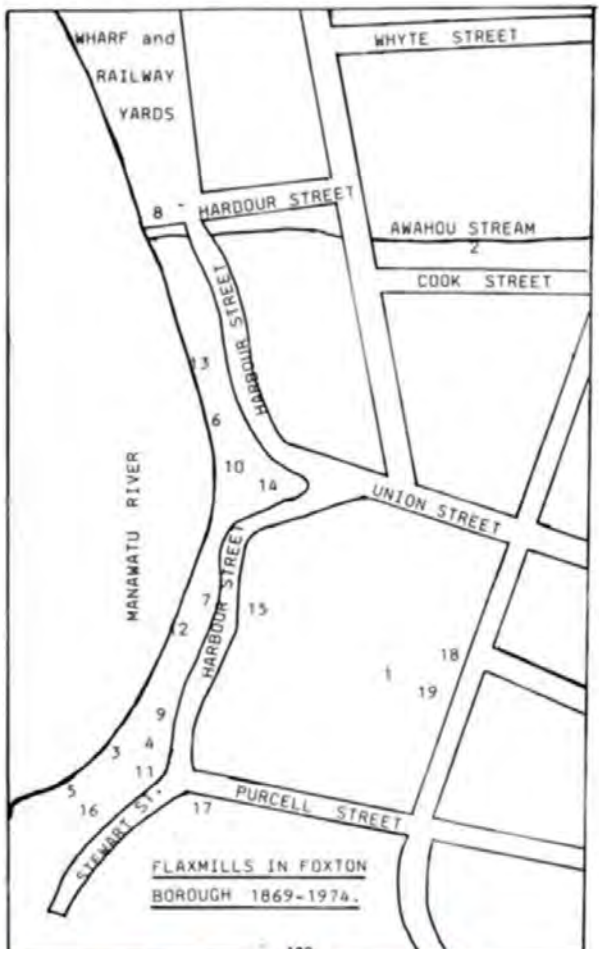


Figure 32: **Flaxmills in Foxton and their lifespan.**[1026]

By 1923, the first significant drainage cut had been through the Matakarapa swamp to straighten the course of the Manawatū.[1027] Adkin referred to Matakarapa as one of the very few river-bank settlements in the Horowhenua that was still in occupation in 1940. He identified Ngāti Takihiku as owners in the area. He records that until recently, when it had been destroyed by fire, a carved meeting house, named Aputa-ki-wairau had stood at Matakarapa. The carver, Hokowhitu Makirika (McGregor) was still living there. Kiri-

[1026] Anonymous, 'Foxton 1888-1988 - Flax Town', Kete Horowhenua 2012. Web. 24 March 2017.
[1027] DT Kahotea, p 5.

mai-i-tawhiti is also identified as a former kāinga belonging to Ngāti Takihiku at the head of the peninsula.[1028]

The Whirokino Cut had been proposed as a spillway of the Manawatū River. The Foxton Borough Council supported the proposal so strongly they sent a deputation to Wellington to urge that the work be 'put in hand'.[1029] It was completed in 1943 as part of the large Lower Manawatū Flood Control Scheme. Chapter 3 of this report provides more detail on the Whirokino Cut. Whilst it was very beneficial to farmers of the region in that it provided significant drainage and the reclamation of over 100,000 acres of land, the scheme involved much alienation of land from Māori landowners. Rerengaohau 2A, 2B and 3A, in the lower parts of the former peninsula were taken under proclamation for river diversion and parts were invested in the Ikaroa District Māori Land Board under the Public Works Act for reclamation, farming and other purposes. Portions of the land blocks were also later proclaimed Crown Land in 1956 and sold by Māori Trustee to the lessee at the time. This included the land where Kahikatea lagoon was situated. Rerengaohau No3 urupā was destroyed by erosion caused by the Manawatū River cut, and Whirokino No3 urupā was also subjected to erosion. The Whirokino cut was initially constructed as a spillway, but a flood broke through its upper end and diverted the river down the spillway which cut off the loop within which Matakarapa was situated from the river. This was problematic as the flax mill waste and effluent from the sewerage system that had been put in place in the 1920s continued to be discharged into the loop, despite it now having no proper outflow.[1030]

By April 1945 it was reported that the river had become a lagoon. The resultant silting was then affecting the sewerage system. The Health Minister was requested to come and inspect the situation and eventually a 5 foot gap was opened at the top end of the loop to provide a flushing. The Minister stated that the government had accepted responsibility and would rectify the situation. The solution was that the mill effluent would be piped across Matakarapa for discharge.[1031]

[1028] GL Adkin, 1948.
[1029] Anonymous, 'Foxton 1888-1988 the Second Fifty Years', Kete Horowhenua 2010. Web. 24 March 2017.
[1030] DT Kahotea, pp 5-6.
[1031] Anonymous, Foxton 1888-1988 the Second Fifty Years', Kete Horowhenua 2010. Web. 24 March 2017.

This however didn't necessarily slow growth in Foxton or the pressure on the loop. A new stripping mill was built in 1948 to support N.Z. Woolpack and Textiles Limited. The supply of water for washing at the stripping mill and for removing waste had been drastically reduced now that the flow through the Loop had dropped off. The waste was carried by bridge to Matakarapa and the Loop began to develop an unpleasant smell. It was reported that the smell was so bad that it in 1952 it was impossible to work the mill for a week.[1032] The government had accepted responsibility of the disposal of effluent by 1950, however this had not addressed the issue of the smell of the loop and the Borough Council, who had originally petitioned the government to begin works on the loop, now made direct representation to the Prime Minister on the lack of action. The river was reportedly showing a high B.O.D count and contamination was evident. There was scum on the water which was 'brackish, discoloured and as black as the ace of spades' according to Councillor Small. Little progress was made and in 1957, the council was reportedly making moves to purchase land at Matakarapa for oxidation ponds.[10331034] Manawatū Kūkūtauākī 7E had an outstanding lien of 27 pounds for survey costs to the Crown, and so the Crown then took possession of Manawatū Kūkūtauākī 7E1A and 7E2A.[1035] The sewerage system was eventually given approval in 1972 and the system was commissioned in 1976. The oxidations ponds were sited at Matakarapa on the Manawatū Kūkūtauākī Block sites.[1036]

NZ Woolpack and Textiles was taken over in 1973, and was then bought out in 1980 by Feltex.[1037]

In 1986, a series of investigations were undertaken into the waste discharged by several industrial factory production sites into the Foxton Wastewater Treatment Plant. Colortron Carpet's waste was investigated through taking three days of continual sampling to demonstrate the typical state of waste from the site. The following range results were presented in the report:

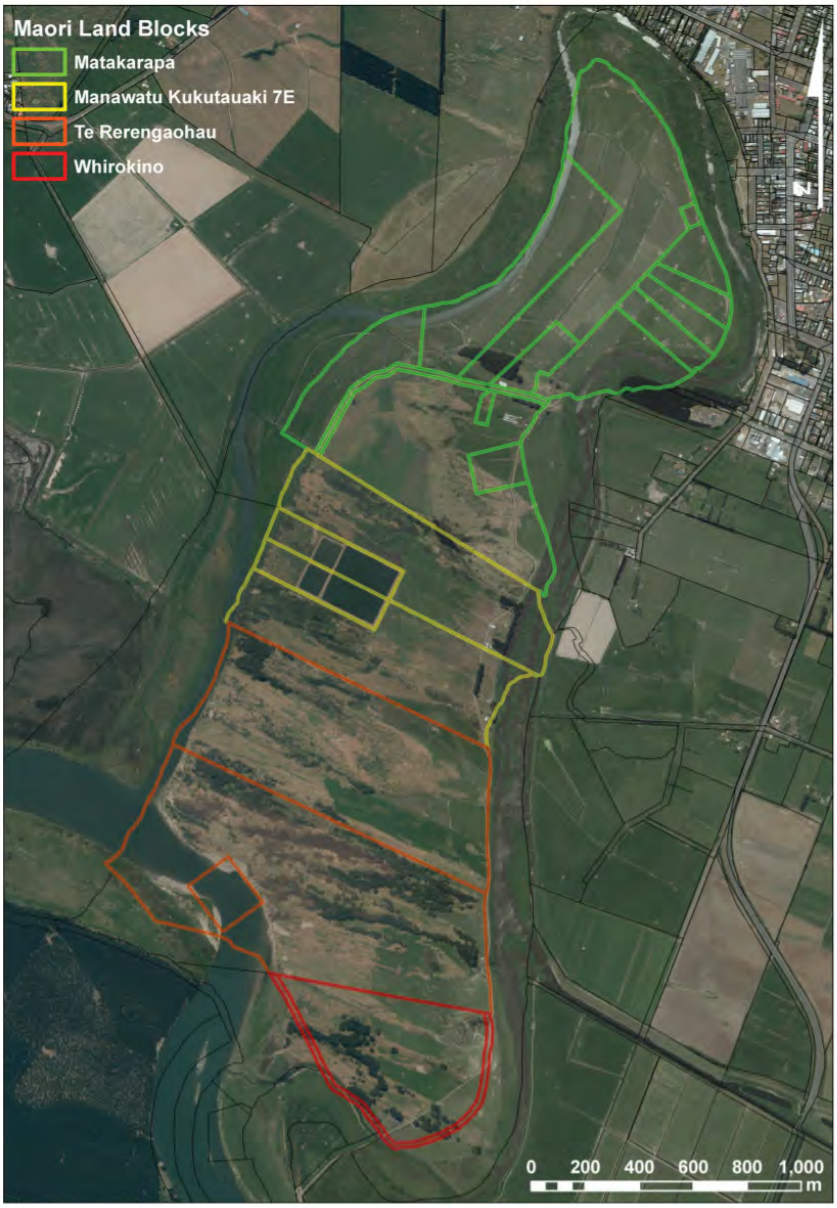
- Total waste loadings of BOD_5 discharged per day: 92-127 kilograms; and

[1032] Anonymous, 'Foxton 1888-1988 - Flax Town', Kete Horowhenua 2012. Web. 24 March 2017.
[1033] Anonymous, 'Foxton 1888-1988 the Second Fifty Years', Kete Horowhenua 2010. Web. 24 March 2017.
[1034] Need further information regarding the alienation of Matakarapa land blocks
[1035] DT Kahotea, p 6.
[1036] Anonymous, 'Foxton 1888-1988 the Second Fifty Years', Kete Horowhenua 2010. Web. 24 March 2017.
[1037] Anonymous, 'Foxton 1888-1988 - Flax Town', Kete Horowhenua 2012. Web. 24 March 2017.

- Total waste loadings of suspended solids discharged per day: 63-130 kilograms.[1038]

Sandy Lodge Ltd, which was a poultry processing factory, was also investigated through taking samples over three days. The following range results were presented in the report:

- Total waste loadings of BOD_5 discharged per day: 302-507 kilograms; and



Map 48: **Historic Māori Land Blacks on Foxton Loop, including Whirokino, Te Rerenga o Hau, Manawatū Kūkūtauākī 7E and Matakarapa.**[1039]

[1038] CR Fowles and HI Barnett, *Invesitgations of Wastes Discharged by Colortron Carpets, Foxton* (Foxton: Colortron Carpets, 1986). Central Archives.

- Total waste loadings of suspended solids discharged per day: 197-304 kilograms.[1040]

Manawatū Potato Processers Ltd was also investigated, their principal waste emanated from washing the dirt from the potatoes, steam peeling of the potatoes and washing the product at the later stages of processing. Minor volumes of preservative and bleaching agent were also used in production. The investigation sampled the waste water that was discharged to the WWTP with the following results:

- Total waste loadings of BOD_5 discharged per day: 196-203 kilograms; and
- Total waste loadings of suspended solids discharged per day: 279 kilograms.[1041]

These results indicate the high levels of waste that have been discharged into the Manawatū River at the loop for some time.

Since the establishment of the wastewater treatment plant in 1976, there has been a recognition that the cumulative effects of wastewater and industrial waste discharges into the Manawatū are not sustainable. In 2015, Horowhenua District Council applied for consents in relation to the upgrade of the Foxton Wastewater Treatment Plant. The consents applied for included:

- Land use consent for large scale earthworks; associated with upgrading and the additional storage to the existing plant, including trenching for the installation of irrigation reticulation.
- Discharge permit to treat and store wastewater and the associated discharge of treated wastewater to land which may enter water for a term of 35 years
- Discharge permit to discharge aerosols and odour to air for a term of 35 years
- Discharge permit to discharge treated wastewater to land which may enter water for a term of 35 years
- Discharge permit to discharge treated wastewater to water from the plant oxidation ponds to the Foxton Loop for a term of three years

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[1039] D J Parker, *An Assessment of Effects for a Proposed Expansion of the Wastewater Treatment Plant at Matakarapa, South of Foxton* (Levin: inSite Archaeology Ltd, 2015), p 12.

[1040] CR Fowles, *Investigations of Wastes' Volumes and Strengths Discharged by Sandy Lodge Ltd, Foxton.* (Foxton: Sandy Lodge Ltd, 1986). Archives Central file, HDC 00316:1920/473.

[1041] CR Fowles and AW Bee, *An Investigation of Volumes and Concentrations of Industrial Wastes Discharged by Manawatū Potato Processors Ltd., Foxton* (Foxton: Manawatū Potato Processors Ltd, 1986). Central Archives.

- Land use consent for an intensive farming activity. being the irrigation of wastewater to land such that the use of the land is an intensive farming unit[1042]

As part of the application for the resource consents, Horowhenua District Council (HDC) consulted with Ngāti Whakatere, Rangitāne and other unspecified hapū of Ngāti Raukawa based in Foxton and summarised the outcomes of this consultation in their report 'Foxton Wastewater Treatment Plant, Tangata Whenua Considerations The report produced by Horowhenua District Council on 'Tangata Whenua Considerations' canvases a number of iwi and hapū representatives all objecting to the use of Matakarapa for treatment of wastewater due to it being sacred and containing a number of sites of significance, and also suggested a number of other alternative sites for land discharge. Despite capturing these objections, the report then states that HDC requested written confirmation of these views from tangata whenua and their basis in the form of a Cultural Impact Assessment (CIA), but that the timing of providing the CIA was too late for HDC's timeframes in order for those views to inform the preliminary conceptual design process for the Foxton Wastewater Treatment Plant.[1043]

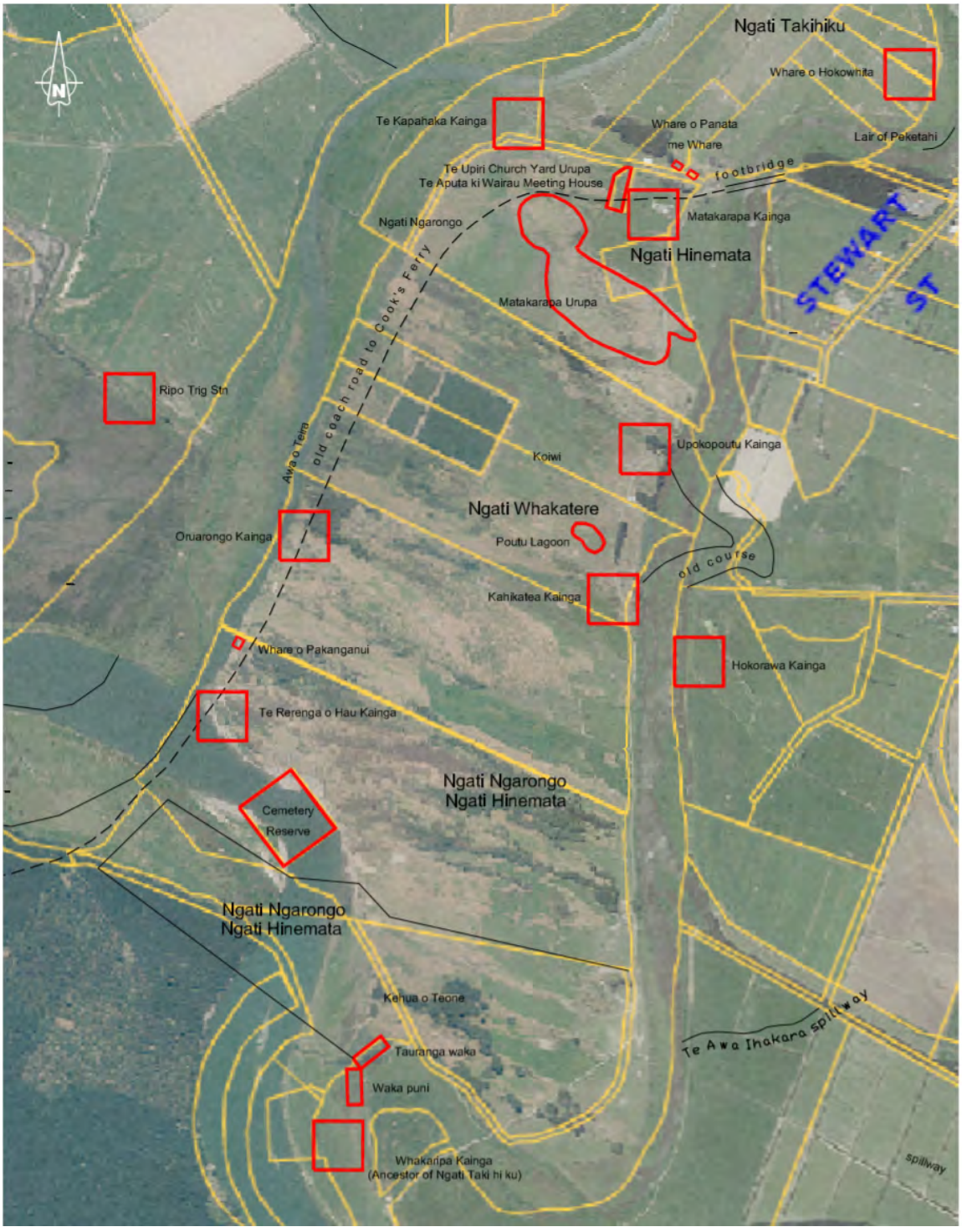
Map 49 presents the cultural sites of significance identified by iwi member Te Kenehi Teira as supporting evidence and is appendixed to the report on Tangata Whenua Considerations.

The report then concludes that

- No agreement was reached on a land discharge site that could 'meet tangata whenua cultural expectations'
- Tangata whenua did not agree with HDC that effects of a land discharge at Matakarapa on river water quality, on mauri, and on kaimoana would be less than minor
- Tangata whenua also did not agree with HDC that land discharge at Matakarapa on sites of significance could be avoided, given the value of the Matakarapa as a whole[1044]

[1042] Horowhenua District Council, *Foxton Wastewater Discharge – Resource Consent Application*. (Levin: Horowhenua District Council, 2015.
[1043] H Lowe, *Foxton Wastewater Treatment Plant Tangata Whenua Considerations - Prepared for Horowhenua District Council* (Levin: Horowhenua District Council, 2015), p 18.
[1044] Ibid p. 26

Horowhenua District Council then sought that the consent be referred directly to the Environment Court. This was granted by both HDC and Horizons Regional Council. The hearing for this started on the 27th of March and was still being heard at the time of writing this report.



Map 49: **Cultural sites of significance for Ngāti Hinemata, Ngāti Ngārongo, Ngāti Whakatere, Ngāti Takihiku on Matakarapa Island as presented by Te Kenehi Teira**

5.4.4 Case Study Eighteen: Shannon Wastewater

The Shannon Wastewater Treatment Plant (SWTP) is owned by Horowhenua District Council (HDC) and first became operational in the early 1970s. It discharged treated wastewater into the Otauru Stream which then flowed into a reach of Otauru Stream that has been referred to as Mangaore Stream by Councils, which after a kilometre then flows into the Manawatū River.

It operated under water right PAC 325/51 which was granted in 1970, and this then expired on 1 July 2001. HDC applied to the Manawatū Wanganui Regional Council for a new discharge permit in March 2001 in accordance with s124 of the Resource Management Act, which enabled the discharge of treated wastewater to continue in accordance with the original conditions. SWTP continued to discharge treated wastewater for 14 years after the expiry of the original discharge permit, while the application sat undetermined, before they were able to gain a new consent.[1045] Whilst the original granting of a water permit for discharge of wastewater directly to the Manawatū River, and the subsequent discharges of wastewater for over a decade without a consent are both resource management issues that have undeniably affected local iwi Ngāti Whakatere and are worth closer attention, this case study will focus on the process of HDC gaining a new consent to discharge wastewater, in particular to highlight that the mismanagement of wastewater effects on water and mana whenua are not just historical matters, but in fact are a reality for many iwi and hapū today. It highlights inadequacies of the current resource management process under the Resource Management Act 1991.

New resource consents were applied for in October 2006, which were declined by Horizons Regional Council. A further resource consent was lodged in November 2007 but the process was found to be procedurally deficient by the Environment Court and no consent was granted. Consents were then granted in 2012 for discharge to the Manawatū River for a limited period of time of four years while a long-term strategy could be developed based on land disposal. Recommendations were made then to undertake a range of assessments within that period.

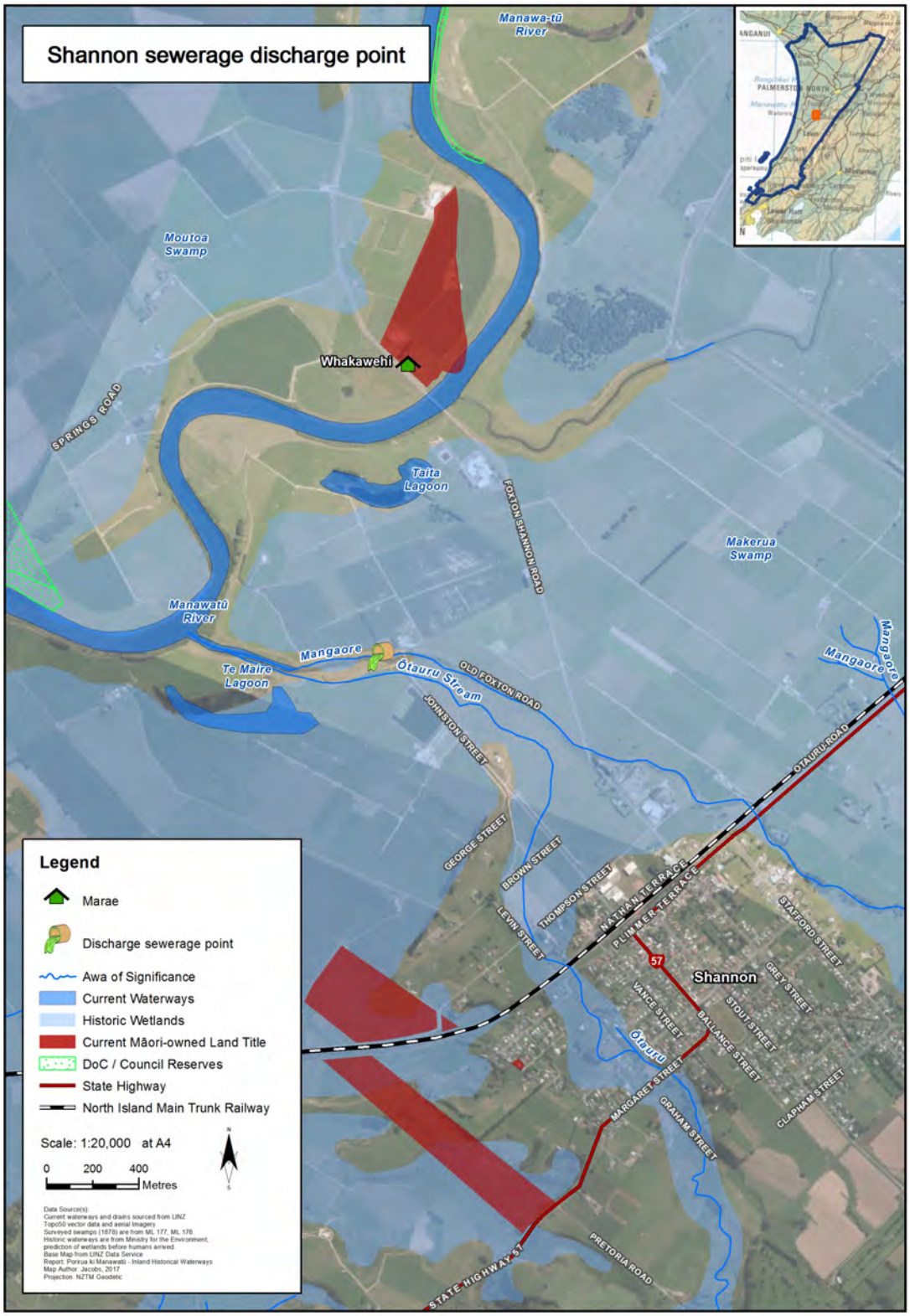
HDC purchased Velvaleen Farm in 2013, which was immediately adjacent to the SWTP in preparation for their new application where they planned to discharge the majority of

[1045] Judge BP Dwyer, *Environment Court Decision [2015] Nzenvc45*, Palmerston North, 2015.

treated wastewater to land as part of their proposed substantive upgrade to a combined land and water discharge (CLAWD) system, as opposed to discharging the treated wastewater directly to water as proposed. HDC then applied to HRC and HDC in late 2013 for various resource consents to enable on-going discharge of treated wastewater from the SWTP. [1046]

From the outset of pursuing consent, HDC showed preference for engaging with the iwi Rangitane who were prior occupants of the area and with broader interests in the Manawatū River, over the local mana whenua Ngāti Whakatere, a hapū of Ngāti Raukawa. The marae of Ngāti Whakatere, Whakawehi, is located in close proximity to the wastewater treatment plant and on the banks of the Manawatū River (see Map 50). The resource consent application states that 'Rangitaane o Manawatū was understood to have mandate over the Shannon area and the Manawatū River in the vicinity of the Manawatū River. In order to ensure this approach was appropriate, confirmation was sought from Horizons who confirmed this to be the case' and that 'HDC understands that Ngāti Whakatere is strongly opposed to the proposed discharge to the Manawatū River and has relayed their belief they have mandate over the Manawatū River in the vicinity of Shannon.'[1047]

[1046] Ibid. 5-6
[1047] Horowhenua District Council, *Resource Consent and Assessment of Environmental Effects: Shannon Wastewater Discharges,* (Levin: Horowhenua District Council, 2013), pp 104-6.



Map 50: **Shannon sewerage discharge point.**[1048]

[1048] Created by Jacobs, courtesy of Crown Forestry Rental Trust.

It is difficult to accept that HDC and HRC were under a reasonable belief that Rangitaane were mana whenua in Shannon, particularly given that HRC and HDC are both parties to the 'Manawatū River Leaders' Accord' in 2010 in which the mana whenua status of iwi of Ngāti Raukawa, and other hapū including Ngāti Whakatere was recognised, through their status as signatories to the Accord.[1049] There is therefore no reasonable explanation for neither HDC or HRC not recognising that Ngāti Whakatere are the mana whenua of Shannon and should have been recognised as such through the development of the proposal. There is also no evidence that HDC or HRC made an attempt to determine who holds mana whenua status.

HDC state in their application that they made multiple attempts to arrange a further meeting with Ngāti Whakatere but that initial attempts were unsuccessful, so HDC commissioned an independent third party to undertake a review of the cultural issues.[1050]

However, an archive document provided by Ngāti Whakatere which compiles their record of the development of the application they note that HDC in fact requested that Rangitaane undertake a Cultural Impact Assessment much earlier in 2008, whilst no such approach was made to Ngāti Whakatere.[1051] This is supported in the 'Cultural Issues Review' produced by 'third-party reviewer' Buddy Mikaere who states that a number of meetings were held and in 2008 a Cultural Impact Assessment was commissioned, these meetings did not include Ngāti Whakatere.[1052] It is not clear from the report what Buddy Mikaere's qualifications are that made him suitable to carry out this review, and his business was liquidated 15th May 2013,[1053] which is before the date the Cultural Issues Review was published, that being 9 November 2013.

The report doesn't appear to provide much by way of evidence as to the relationship that mana whenua have to the Manawatū River or the area surrounding the SWTP. For example, the cultural issues section of the report states that:

> 'research shows that from a tangata whenua perspective the Manawatū River has many roles chief amongst them being that of iconic symbol of tribal identity.'

[1049] Horizons Regional Council, 2010.
[1050] Horowhenua District Council, 2013, p 106.
[1051] Te Rōpū Taiao o Ngāti Whakatere, Shannon Wastewater Treatment Plant Summary as at 22 October 2015, 2015.
[1052] B Mikaere, Shannon Wastewater Treatment Plant Cultural Issues Review, 2013.
[1053] WC Lau, Buddy Mikaere & Associates Limited Liquidator's Final Report, 2013.

It doesn't reference what this 'research' is or where it was sourced from. This might be explained when considering that the consultant recognises that his attempts to even meet with Ngāti Whakatere to discuss cultural issues were unsuccessful. It does not document when or how these attempts were apparently made, but it is worth noting that the consultant produced the review despite failing to actually consult with the local mana whenua at all.[1054]

The review also notes that one discussion was held with Ngāti Whakatere in October 2013 at Poutu marae but this must not have included Mikaere given his statement that his attempts were unsuccessful. At this hui, Ngāti Whakatere had articulated that they were concerned that the timeframe for the application meant there was insufficient time for the assessment of their issues before lodgement. Mikaere suggests that AEE documents were regarded as 'living documents' and there was the possibility for amendments to be made in the future and that he considered that Ngāti Whakatere receiving a completed AEE, despite it not addressing their concerns would be 'helpful' for consultation purposes. The review makes a number of assertions about values such as native fish species, waahi tapu, sites of significance, and even Whakatere traditions on two taniwha, all without having actually consulted with Ngāti Whakatere on their perspective on these. There is no detailed evidence provided on the specific nature of the relationship between Ngāti Whakatere and the Manawatū River, for example the scale of mahinga kai practices that supports the families and the marae of the hapū.

Towards the end of the report, it gives the impression of attempting to defend the proposal against assertions Mikaere is aware Ngāti Whakatere has made in the past. For example, in response to Ngāti Whakatere's position that the proposal will have potential negative impacts on future generations, the author states that 'this is clearly not the intention of the project. Against the project proposals more detail is required to ascertain what those impacts might be and how they can be.' This seems to be an odd statement to make given that the purpose of Mikaere's own report is to in fact ascertain what those impacts might be.

Mikaere states that 'the RMA process does not require that consultation take place', which seems unqualified and a questionable assertion for a consultant who apparently

[1054] Mikaere, 2013, p 14.

provides advice on resource management and cultural matters. He recommends that in the meantime, consultation with Ngāti Whakatere happen on a formal basis possibly through a Memorandum of Understanding arrangement and that both Council and Ngāti Whakatere were willing to proceed down this path

However, no changes were subsequently made to the AEE based on consultation with Ngāti Whakatere, and no formal arrangements to guarantee consultation as Treaty partners were made. In fact, HDC made application to HRC and HDC on the 14th of November 2013: five days after Mikaere's report was published. HDC then requested that the applications were referred to the Environment Court. This gave no opportunity for Whakatere to even review Mikaere's report before it was lodged in support of the application. Ngāti Whakatere then had to seek the services of a lawyer, in order for them to adequately participate in the decision-making process further.

In the final application heard through the Environment Court, HDC proposed that 81 per cent of the treated wastewater was to be discharged by spray irrigation to land. The other 19 per cent was to be discharged through a pipe directly to the River during flows above the 20th flow exceedance percentile at times when the proposed wastewater storage facilities had reached their capacity and high rainfall made the application of treated wastewater to land impractical.

HDC applied for the following consents from HRC:

- discharge permit to discharge treated wastewater from the SWTP oxidation pond to the Otauru Stream for a term of two years;
- discharge permit to discharge treated wastewater from the SWTP onto and into land by irrigation for a term of 35 years;
- discharge permit to discharge odour and aerosols to air associated with the discharge of treated wastewater from the SWTP onto land by irrigation for a term of 35 years;
- discharge permit to discharge treated wastewater to the River from the SWTP when flow in the River is at or above the 20th Flow Exceedance Percentile for a term of 35 years;
- land use consent for the excavation, drilling, tunnelling or other land disturbance within eight metres of -

- the toe of the 'Mangaore Stream' (referred to as Otauru Stream by Ngāti Whakatere);
- the true left stop bank of the River;

- land use consent for the erection or placement, operation and maintenance of pipelines and associated structures in, on, under and/or over the bed of the 'Mangaore Stream' and 'Stansell's Drain' for an unlimited term; and
- land use consent for large scale land disturbance associated with the construction of storage tanks at the SWTP and trenching for pipelines for a term of two years.

The following resource consents were applied for from HDC for an unlimited term:

- the spreading of effluent;
- earthworks associated with trenching for pipelines; and
- reticulation infrastructure.[1055]

The diagram (Figure 33 below) provided in the application demonstrates the general approach of the proposed design in comparison to the existing proposal:

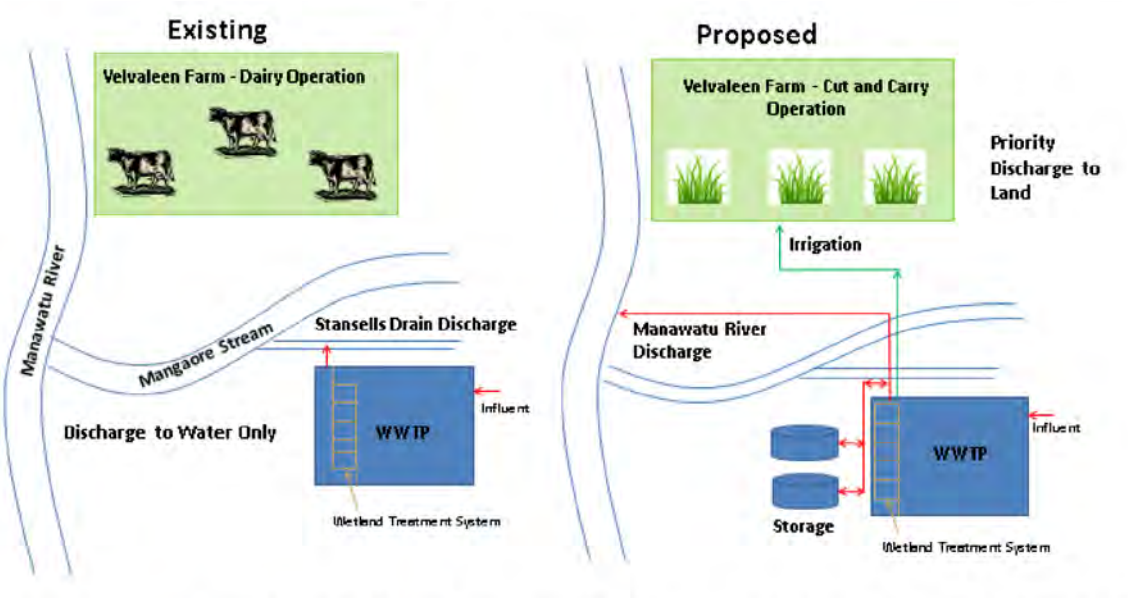
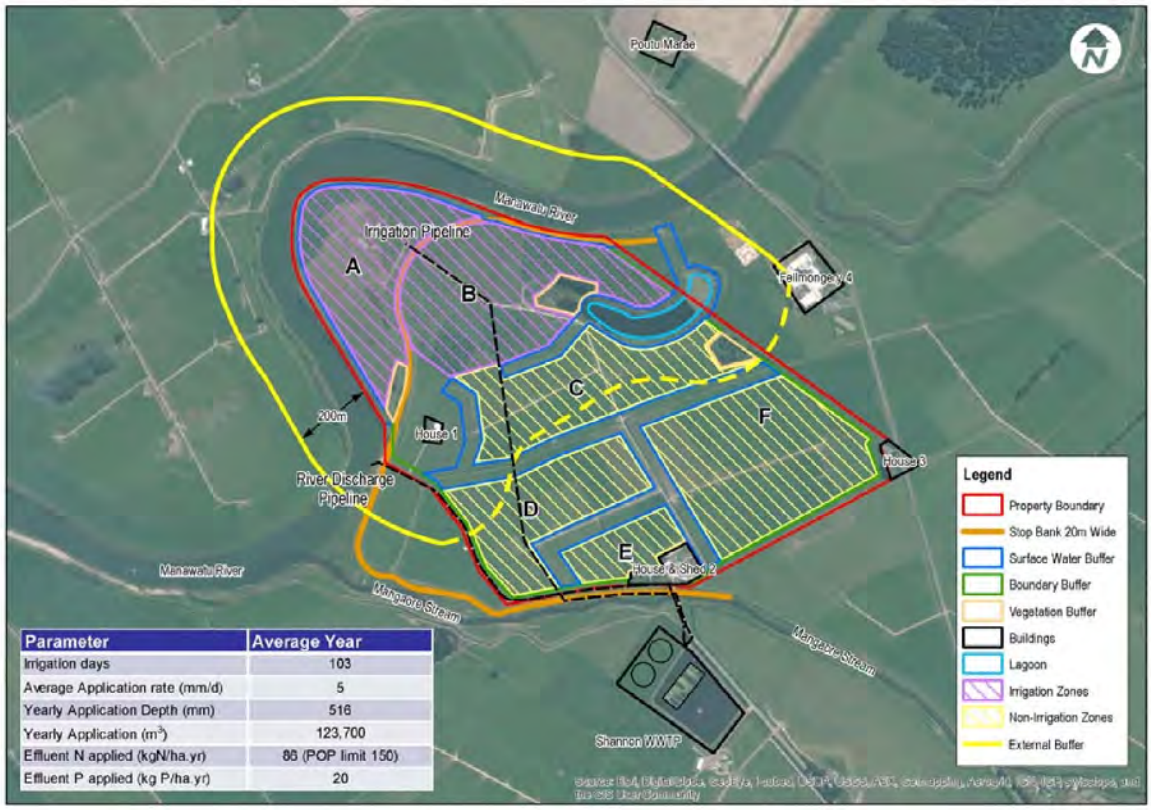


Figure 33: **Approach of the proposed design in comparison to the existing proposal.**[1056]

In June 2014 an initial mediation meeting was held and there was an agreement to undertake a five year trial to assess the feasibility of irrigating treated wastewater onto a

[1055] Dwyer, 2015, pp 6-9.
[1056] Horowhenua District Council, 2013.

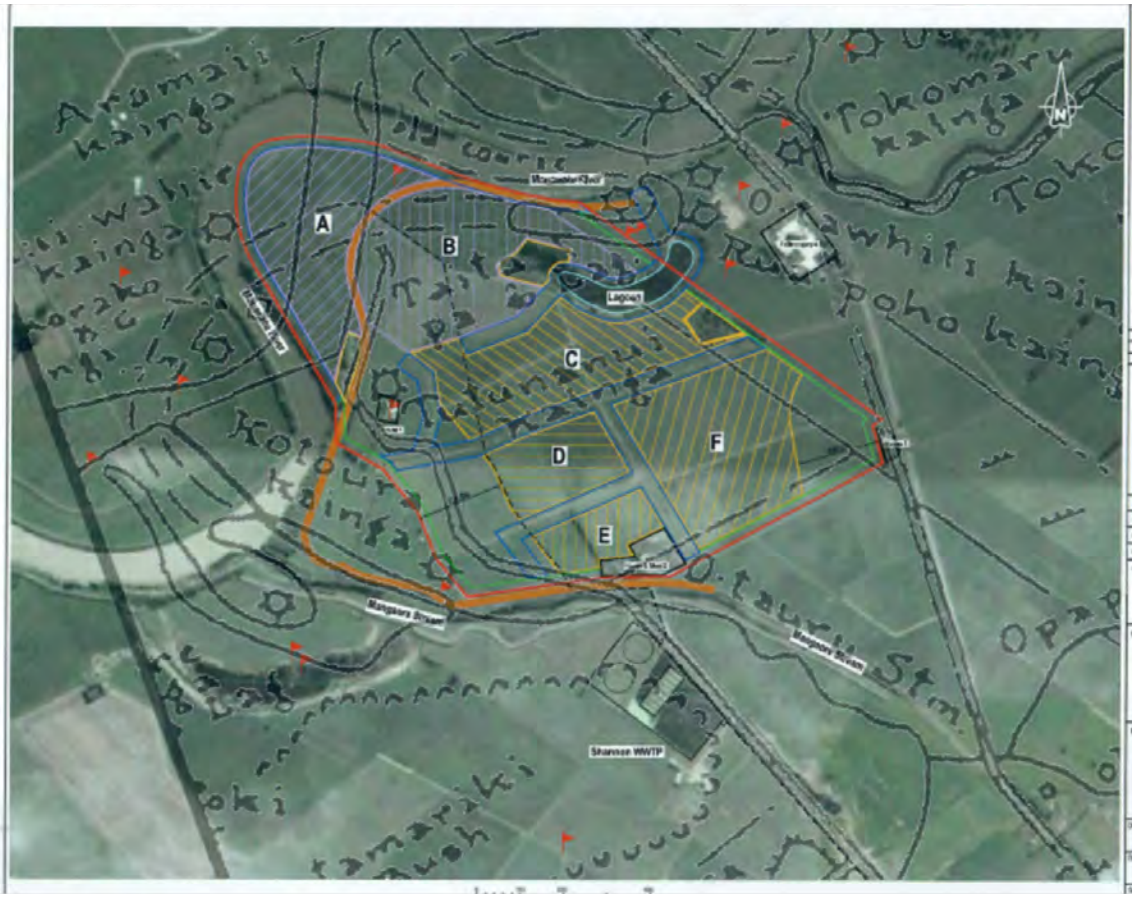
larger area of land and at higher applicate rates and to use a 'high rate land passage system' (HRLPS) to discharge treated wastewater to the River instead of directly through a pipe as had been originally proposed. The potential irrigation sites were divided into 'zones' as seen in Map 51 below.



Map 51: **Zones of potential irrigation sites.**

Ngāti Whakatere provided the following map (Map 52) which shows an overlay of the zoned areas over the sites of significance as mapped by Adkin.[1057]

[1057] Adkin, 1948.



Map 52: **Overlay of zoned areas with sites of significance to Ngāti Whakatere.**[1058]

An internal HRLPS was proposed for Irrigation Zone D of Velvaleen Farm and an external HRLPS in irrigation Zone A of Velvaleen Farm. In October 2014 HDC agreed not to irrigate onto the land nearest the River (the area identified as Zone A) if the irrigation trial showed it is possible to irrigate only onto remaining areas.

Eventually preference was shown for discharge to land in Zones A and B, because technical investigation had shown that irrigation onto Zones C to F would only marginally reduce the volume of treated wastewater requiring discharge to the River and it was therefore considered that this would provide no marginal environmental benefit compared to irrigating Zones A and B only and would increase costs. The additional costs of irrigating on Zones C to F would be in the order of $300,000. The Court was concerned irrigation into Zones C to F would require increased management, increased investigation, increased monitoring and increased time, resources and cost for ongoing operation compared to irrigation to Areas A and B only, and that there was no certainty

[1058] Te Rōpū Taiao o Ngāti Whakatere, 2015.

that irrigation onto Zones C and F would result in any significant reduction in flows to the River. The cultural effects to sites of significance were not taken into consideration by the Court when determining the preferred sites for irrigation.

Ngāti Whakatere expressed concerns that there were potential effects on the River by irrigating land in such close proximity to the River, and in their experience as residents and kaitiaki, Zone A did regularly flood. The Court found that there was no evidence presented to support the premise that the adverse effects on the River were a significant concern. The Court also heard from Mr Robert Ketu on behalf of Ngāti Whakatere that Site A had been the location of the Taita Battleground and indicated that Ngāti Whakatere had made an application Heritage New Zealand Pouhere Taonga (HNZ) for recognition of this site as a waahi tapu. The Court decision states that 'No evidence was presented to us in relation to the waahi tapu status of Site A and that it was not raised by Counsel for Ngāti Whakatere so the Court was not able to address it any further.[1059] There is evidence of Taita pā in Adkin's publication 'Horowhenua' and in his maps of Shannon.[1060]

In Section 5.10 of the consent application 'Archaeological and Cultural Values' it states that two sites had been identified by Rangitane within the Application site and that there are no archaeological sites of features registered the Horowhenua District Plan or on the New Zealand Historic Places Trust register. There is no mention of sites of significance to Ngāti Whakatere.[1061] However, Ngāti Whakatere members had articulated in their interviews conducted for the Inland Waterways Cultural Perspectives report that in fact two archaeologists were engaged by HDC to assess the archaeological values, Michael Taylor first and then Daniel Parker, who conducted site visits with members of Ngāti Whakatere to support reports they were writing, but that these reports were decommissioned and their findings not included in the applications finally submitted by HDC. It appeared that the burden of proof lay on Ngāti Whakatere to use their resources to prove that the site was significant using the expertise of archaeologists, rather than being able to rely on their own expert evidence as kaitiaki, or the burden of proof lying on HDC as the applicant to demonstrate that there would be no more than minor adverse effects on archaeological values.

[1059] Dwyer, 2015, pp 13-23.
[1060] Adkin, 1948.
[1061] Horowhenua District Council, 2013.

Regarding the effects to the relationship between Ngāti Whakatere and the River, the Court notes that evidence presented by Ngāti Whakatere showed that the practice of discharging treated wastewater inot the Manawatū River is ‘culturally, spiritually, and physically abhorrent and offensive to Ngāti Whakatere and that they are opposed to any pipe going into Zone A and therefore any discharge into the Manawatū River. The Court determined that because the previous landowners held consent to discharge untreated dairy shed wastewater to land, that the irrigation of treated human wastewater from the SWTP onto land was considered to replace an existing discharge and not introduce a completely new discharge to the land. This didn’t consider that the environmental, public health and cultural effects of the discharge of human wastewater are different to those of the discharge of dairy shed wastewater. The Court determined that the effects of discharges to the River and Estuary under the conditions proposed will be no more than minor.

The Court noted that for all wastewater to be irrigated to land wold cost and extra $9.35 million capital and $31,500 operating costs. The Court then determined that no measurable benefits would result from the application of all treated wastewater to land. Despite the potential effects to sites of significance, and increased risk of pollution of the River through the use of Zone A for irrigation, ultimately the Court found that ‘on balance, based on the evidence presented to us, we consider that the overall purpose of the Act will be better achieved if Zone A is available for irrigation. The Court found that any decision of HNZ relating to the waahi tapu status of Zone A will be important, but as no formal documentation has been entered into between Ngāti Whakatere and HNZ, that is a matter that will have to be addressed as appropriate at a later time.

The Court stated that it is clear from the evidence and acknowledged by HDC that consultation, particularly in relation to consultation with Ngāti Whakatere, historically in relation to the SWTP can be fairly described has ‘having a number of shortcomings. It states that due to initial shortcomings in HDC’s consultation with Ngāti Whakatere that the cultural issues were not addressed effectively in the early stages of the resource consent process.

However in the view of the Court, the conditions of the consent provide for tangata whenua to be invited to participate in the Shannon Wastewater Working Party (SWWP). The Court notes ‘the commitment made by the Chief Executive of the District Council in

paragraph 21 of his evidence that community engagement through the SWWP will be an on-going process throughout the operation of the consents and that the Court commends the District Council for this approach.' This gives an impression that Ngāti Whakatere are considered as part of the other stakeholders that comprise the SWWP; there isn't consideration shown by the Court as to how HDC have taken the principles of the Treaty of Waitangi into account, in particular the principle of partnership with Ngāti Whakatere as mana whenua. [1062]

The Court decision states that the proposal provides for the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga. Despite the fact that the relationship of Ngāti Whakatere with their river has been severed through discharge of treated sewerage to it and that their evidence that Zone A is a waahi tapu was effectively ignored by the Court. The Court found that the conditions also provide for mana whenua to undertake cultural health index monitoring. The Court therefore was satisfied that the conditions allow for the effective management of cultural effects of discharges.

Condition 26 of Discharge Permits 106893, 106894 and 106895 states that within two years of the granting of the permits, HDC must invite Te Roopu Taiao o Ngāti Whakatere to undertake Cultural Health Index Monitoring and if accepted, the Permit Holder must commission Ngāti Whakatere to undertake Cultural Health Index Monitoring in compliance with Ngāti Whakatere's protocols. However there is no detail over how monitoring will actually influence change in management. Meaning that if mana whenua detect effects through their monitoring, there is not a clear mechanism in any of the planning documents or conditions for this to actually trigger a management response.

The consents as applied for were granted on the 20th of March 2015.

Meanwhile, Ngāti Whakatere's record show that on the 20th of January 2015, they wrote to Heritage NZ to initiate the process to have the status of the waahi tapu site in Zone A recognised by writing them a letter. On the 19th February 2015, Heritage NZ acknowledges receipt of the letter and forwards necessary documentation to have the site's status recognised. Ngāti Whakatere's records show that on the 15th October 2015,

[1062] Dwyer, 2015, pp 15-26.

Heritage NZ lawyer Geraldine Baumann had instructed the HDC to completed the Archaeological Assessment of Velvaleen farm started by Michael Taylor in 2013.[1063]

By the end of 2015, a number of complaints had been made about the SWTP. The Manawatū Standard reported that at Horizon Regional Council's environment committee meeting, public speakers implored the council to take action over the historical significance of the site. Representatives of Ngāti Whakatere asked for an archaeological assessment to be done on the farm site. The response of HRC was that they didn't have regulatory power through conditions of the consent issued by the Environment Court. They emphasised that the cultural monitoring programme conditioned to the consent was central to dealing with the archaeological and waahi tapu values of the site.[1064]

At the time of writing this report, Te Roopu Taiao o Ngāti Whakatere had still not reached an agreement with HDC regarding the commissioning of a cultural health index monitoring programme despite it being more than two years after the issuing of the permits, and this being a condition of consent. This means that the discharges are now happening outside of the conditions of the consent, and there is no evidence that HRC is taking actions to ensure that HDC is compliant with these conditions.

There is more recent evidence that Ngāti Whakatere is still significantly limited in their ability to engaged with HDC. It was reported by stuff.co.nz on the 18th of July 2017, that a leaked internal draft audit reported that the Chief Executive had blocked emails from local representatives including the Mayor, a councillor, a ratepayer's association representative and Robert Ketu who was the representative of Ngāti Whakatere. An academic who specialised in freedom of speech was quoted in the media report that the censoring of an elected politician's emails was 'horrendous.' Other councillors however had come out in support of the CE's actions. Much of the inability to consult with Ngāti Whakatere has been framed by HDC during the Court proceedings as due to Ngāti Whakatere not being accessible, however in light of the audit's report, this raises

[1063] Te Rōpū Taiao o Ngāti Whakatere, 2015.

[1064] N McBride, 'Horizons has no power to take action over Shannon Wastewater Treatment Plant', in *Manawatū Standard*, 14 December 2015. http://www.stuff.co.nz/manawatu-standard/news/74911613/horizons-has-no-power-to-take-action-over-shannon-wastewater-treatment-plant.

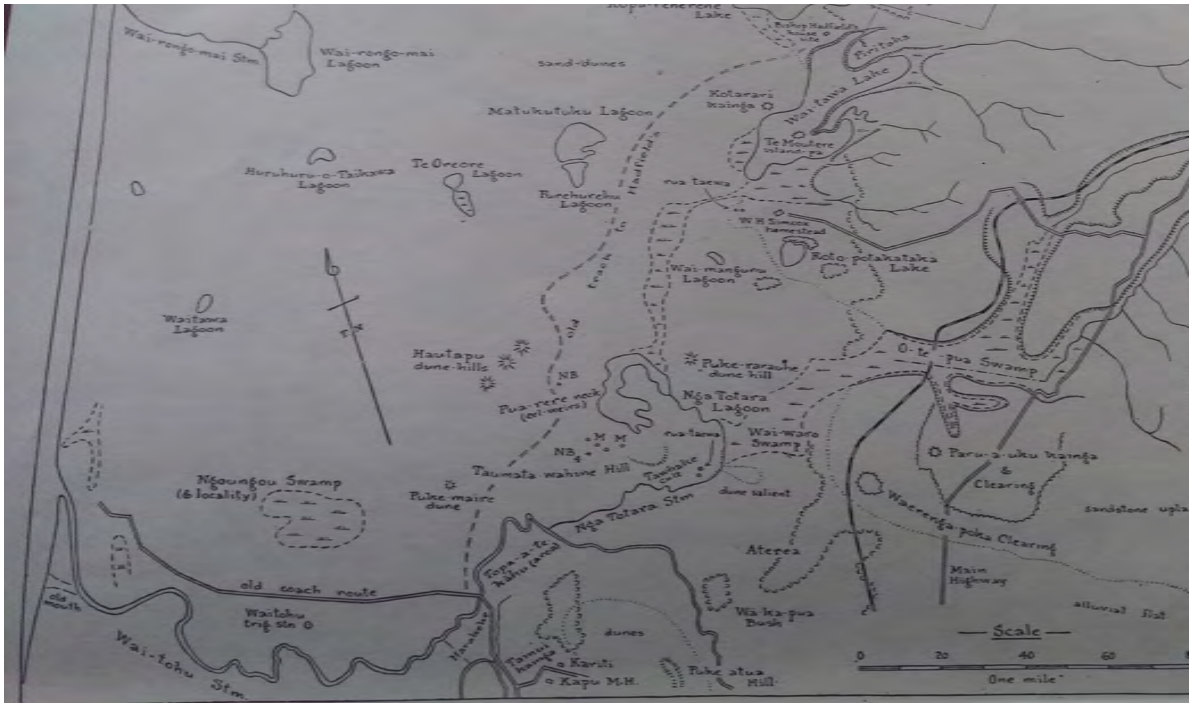
questions about how Ngāti Whakatere are expected to engage and communicate with HDC.[1065]

This case study highlights how easy it has been for local authorities to operate wastewater facilities which have significant potential effects often without being well regulated. It also demonstrates how the inability of local authorities to recognise the status of mana whenua can significantly undermine the ability of hapū to have the due influence of the development and outcomes of proposal for wastewater management, and how there is often no recourse available to them to ensure that they have rectify this. In particular, before they are able to see that their relationship with their taonga is given regard, there are many obstacles to them having that relationship articulated. Ngāti Whakatere have had to fight to have their status as mana whenua recognised, and even when it was, they had to suffer a seemingly inadequate review of effects on their values being conducted by a third-party. Their role was diminished to that of a stakeholder, and even then, the leadership of Council is actively preventing them from making contact with them. What conditions of consent may have given them satisfaction that they could carry out their role as kaitiaki and monitor the ongoing potential effects of the operation of the SWTP, have yet to be actioned, and are at risk of ultimately being a mere token gesture if they can't get a guarantee that their monitoring of effects has the ability to change management.

5.4.5 Case Study Nineteen: Discharge of Wastewater into Waitawa/Forest Lakes

This case study details the failings of the Resource Management Act process. Waitawa is the largest of three lakes north of Ōtaki that are today referred to as the 'Forest Lakes' property. It is part of a highly modified dune lake/wetland system and today it is shallow, and 16ha in area. The lake is stream and wetland fed and there is potentially significant input to the lake from groundwater. The outlet flows through wetlands and streams, eventually into the Waitohu Stream.

[1065] M Schroeter & K Tuckey, 'Councillors stand by under-fired chief executive embroiled in email snooping revelations', 18 July 2017. https://www.stuff.co.nz/national/94851657/councillors-stand-by-underfire-chief-executive-embroiled-in-email-snooping-revelations



Map 53: **Waitawa Lakes.**[1066]

The Lake is of significant cultural and historical value to Ngāti Raukawa and Moore records that the lake is considered 'very tapu' by the iwi. Interviews conducted by Moore with representatives of Ngāti Raukawa indicated that there are a number of urupā in the area that hadn't been identified and that Ngāti Raukawa avoided the area. An interviewee also identified the area as the 'cross over of hapū boundaries'. Interviewees identify Ngāti Kapumanawawhiti as one of the hapū that have claim over the area. The report notes that despite the urupā being likely to pre-date Ngāti Raukawa occupation, tikanga dictates that Ngāti Raukawa should care for the site and other people's kōiwi as if they were their own.[1067] An old island pā 'Te Moutere' that had been occupied by Muaūpoko and is situated in the lake is considered likely to be of outstanding archaeological significance.[1068] A site on the promontory on the north side of the lake called 'Piritaha' is an urupā, and human remains were uncovered there in April 2006.[1069] Adkin notes that since 1842 or even earlier there had been accounts of what Ngāti Raukawa regarded a taniwha residing at the lake. These accounts included one by Archdeacon Octavius

[1066] GL Adkin, 1948.
[1067] P Moore, *Lake Waitawa*: Unpublished report to Greater Wellington Regional Council, 2014.
[1068] A Dodd, *Freshwater Archaeological Sites of the Wellington Region* (Paekākāriki: Greater Wellington Regional Council, 2015), p 8.
[1069] P Moore, *Waahi Tapu Project Wts0182av2.3 Site Report for Waitawa Urupā, Ngāti Raukawa.* Unpublished report to Kāpiti Coast District Council, 2012, p 17.

Hadfield in 1869, whose nephews had stopped swimming in the lake after witnessing what they described as a 15-20 feet long creature swimming in its water.[1070] Moore's report provides such accounts from as recently as 2000 when a man had his arm savaged by a very large eel while he was swimming on the edge of the lake, and 2004 when a member of Ngāti Whakatere lost his life while swimming.[1071]

Today the wetlands and some streams that have historically fed Waitawa have limited or no flow. In 2003, sampling detected high levels of cyanobacteria. One-off water quality sampling conducted in 2007 observed algal blooms and macrophyte growth and classified the lake as supertrophic. Of the 45 similar coast lakes sampled it scored as the eighth worst in the world. In 2009, Greater Wellington Regional Council began a water quality monitoring programme at Lake Waitawa. The findings from the programme as reported in a 'state of the environment' report published by Greater Wellington Regional Council in 2012 is detailed below.[1072]

Despite the lake supporting nationally threatened indigenous species, the lake is now dominated by introduced fish species. The principal consented discharge activity near the lake is the discharge of up to 15,340 litres per day of treated wastewater from the Forest Lakes Camp and Conference Centre to a wetland that adjoins the lake's southern arm. This discharge is treated via a multi-cell oxidation pond. There is also a permit authorising discharge of dairy shed wash-down water to land just north of the lake.

The full range of water quality measures indicate a severely degraded and unsafe environment in the lake:

- Median concentrations of both total nitrogen and chlorophyll a were almost twice that of the national median for lakes in pastoral catchments;
- Median total phosphorus concentration was over four times the national median;
- Median concentrations of ammoniacal nitrogen and dissolved reactive phosphorus were also significantly higher than the national median values. As a result of the lake being prone to toxic algal blooms it is not suitable for contact recreation;

[1070] Adkin, G.L. *Horowhenua; Its Māori Place-Names & Their Topographic & Historical Background*. Wellington: Department of Internal Affairs, 1948. Print. p.406 - 407

[1071] Moore, P. *Waahi Tapu Project Wts0182av2.3 Site Report for Waitawa Urupā, Ngāti Raukawa.* : Unpublished report to Kāpiti Coast District Council, 2012. Print. p.17

[1072] A Perrie and JR Milne, 2012.

- Potentially toxic cyanobacteria species were recorded on every sampling occasion of the lake;
- One dinoflagellate taxon known to cause taste and odour problems *Ceratium sp.* was recorded on several occasions;
- The biovolumes of various potentially toxic phytoplankton were compared with the alert level framework in the Ministry for the Environment's national cyanobacteria guidelines for fresh water. On three occasions the biovolume fell within the 'action (red mode)'. This indicates that the water was unsuitable for contact recreation at these times, but no toxin analysis was carried out as part of the investigation to validate this. However, in 2006 extremely high toxin results were recorded in the lake. There isn't any information available on what action was taken;
- The lake was also considered to be 'stratified' during the summer months of November to February. Lake stratification refers to a change in the temperature at different depths of the lake due to the change in water's density with temperature. Stratification can cause fish die-offs and problems with their distribution, and excessive growth of plankton. These conditions are likely to have a significant impact on the amount of habitat available for some fish species. For certain periods of time the bottom 3 metres of the lake may be unsuitable for fish to inhabit; and
- Dissolved oxygen concentrations at the lake bottom were regularly below the threshold considered to be detrimental to most fish species.

The report notes that the relative contributions of nutrient inputs from different sources have not been quantified to date but diffuse inputs from the largely agricultural catchment (entering the lake via shallow groundwater) are likely an important pathway. Grazing of stock up to or close to the lake margin as well as in some of the wetland areas is probably contributing inputs of nitrogen and phosphorus and there have been observations of effluent pooling around the lake. Wastewater from the Forest Lakes Camp and Conference Centre also contributes nutrient; although the wastewater is treated and discharged to a wetland adjacent to the lake, some seepage of nutrients into the southern end of the lake is likely. The 2012 report states that 'this should be investigated and

quantified as part of the Assessment of Environmental Effects prepared in support of an application for a new resource consent for the wastewater discharge in 2014.'[1073]

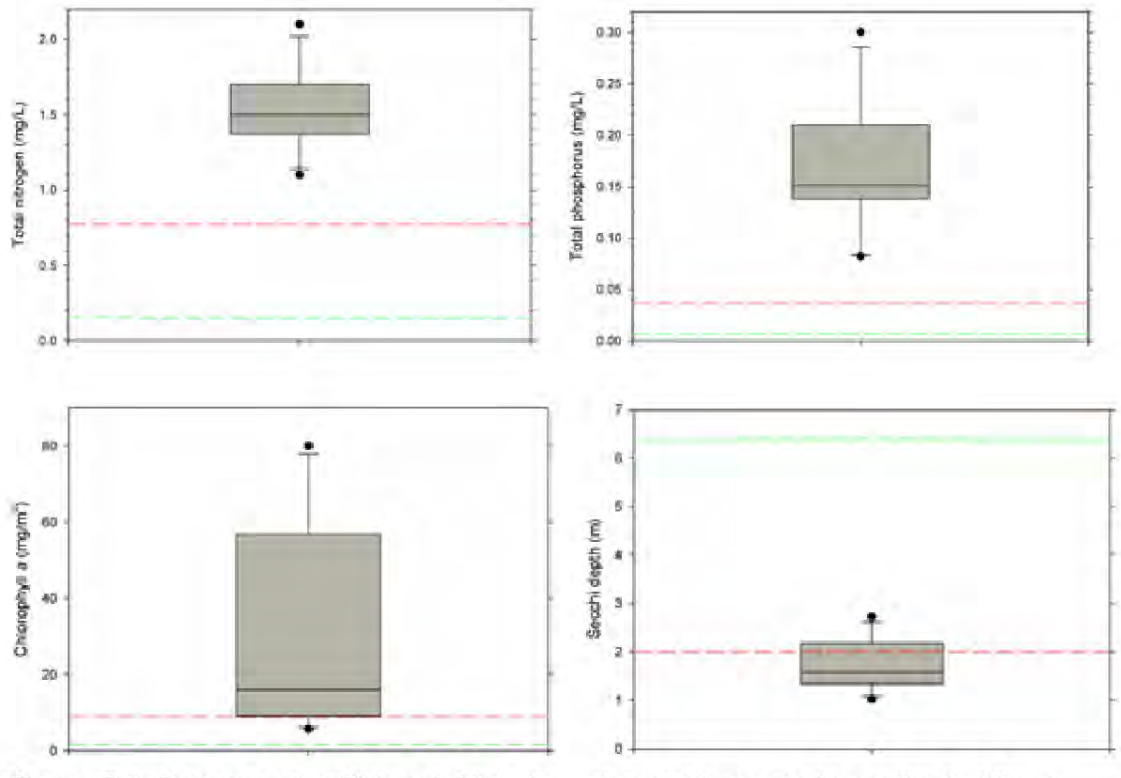


Figure 34: **Greater Wellington Regional Council box plots for TLI variables, based on water samples collected from Lake Waitawa over August 2008 to July 2009 (*n*=11). The horizontal dashed lines indicate national median values (taken from Verburg et al. 2010) for lakes in catchments dominated by indigenous forest (green) and pastoral (Benton, Frame, and Meredith) land cover.**[1074]

An application for consent was lodged in 2013 and then put on hold. The consent processing officer's report details the assessment of the effects of the discharge of treated wastewater to the wetland and Lake Waitawa and the seepage of wastewater through oxidation ponds. The Regional Freshwater Plan identifies Lake Waitawa "as a water body with regionally important amenity and recreational values to be managed for contact recreation purposes." The Regional Freshwater Plan also includes policies that state that the lake is to be managed for aquatic ecosystem purposes.[1075] The application was

[1073] A Perrie and JR Milne, 2012.
[1074] Ibid, p 63.
[1075] Greater Wellington Regional Council. *Non-Notified Resource Consent Application Report and Decision. File Reference Wgn140067*. Wellington: Greater Wellington Regional Council, 2015. Print. p.5

processed on a non-notified basis, meaning that Ngā Hapū o Ōtaki were not identified as an affected party.

The officer's report states that in preparation for developing an application for a new resource consent for the discharge 'the applicant engaged Lowe Environmental Impact to assess the effects of the discharge; however, as this investigation progressed it became clear that gaps in the information available needed to be addressed in order to examine the performance of the wastewater system and its effects on the receiving environment, including effects on contact recreation and aquatic ecosystems.' Lowe Environmental Impact's review report found that available monitoring data from 2004-08 could not be relied upon due to:

> 'their discrepancy with typical values and the lack of knowledge of the exact details of sampling locations. The data does not appear to be able to be used for assessing the actual treatment performance of the waste water treatment plant (WWTP) nor does it necessarily represent the effects of the WWTP discharge alone on the wetland and Lake Waitawa. As such, the applicant has applied for short term consent to fill the information gaps, to assess the effects of the discharge and inform decisions about upgrades to the wastewater treatment system.'[1076]

Put another way, given that the applicant was not able to provide information on the effects of the operation of the wastewater treatment system, including the discharge of treated wastewater, the applicant was applying to get consent for its operation, and then assess what the effects were. The applicant therefore applied for a three year consent to provide for the continued discharge of up to 15,340 litres per day of treated effluent to a wetland that flows into the Lake.

The officer's report notes that they consulted with a representative of Ngā Hapū o Ōtaki (the entity that represents the five Ngāti Raukawa hapū in the Ōtaki: Ngāti Huia, Ngāti Pare, Ngāti Koroki, Ngāti Maiotaki, Ngāti Kapumanawawhiti), who expressed concern about the nutrient load going into Lake Waitawa. The representative requested the following conditions be included in any resource consent that was granted:

[1076] Lowe Environmental, Review of Wastewater Treatment Plant and Discharge Performance: Forest Lakes Camping and Conference Centre (no date).

- A requirement to monitor total nitrogen;
- Guidance be provided to the applicant about what would be acceptable discharge from the wastewater treatment system to the lake;
- Options are investigated for increasing overland flow before the discharge enters the land or the construction of a better wetland; and
- Cultural health monitoring as part of the consent conditions.

The discharge continued without consent until 10 July 2016 when the permit to discharge treated wastewater at the same rate, and the permit to discharge seepage from the base of the wastewater treatment ponds to land that may enter groundwater were both granted. The consent processing officer included the recommended monitoring of total nitrogen as part of the proposed monitoring conditions, and included an investigation of increased overland flow or better wetland construction into required detailed assessment to be undertaken 12 months prior to the expiry of the consent.

However, the other recommendations made by Ngā Hapū o Ōtaki were not adopted. The consent processing officer determined that because Greater Wellington Regional Council's 'Whaitua' process for the Kāpiti Coast would not have been completed at the time the consent came up for renewal, there were no limits in place for discharges to Lake Waitawa. The 'Whaitua' process being referred to is the basis for Greater Wellington Regional Council's programme to implement the Crown's National Policy Statement for Freshwater Management 2014 (NPS-FM). The NPS-FM includes provisions for committees such as Whaitua to set water quality limits in order to meet national and regional objectives relating to water.[1077] However, Greater Wellington Regional Council are yet to establish a Whaitua committee on the Kāpiti Coast and therefore no water quality limits have been set for the area, and are unlikely to be set for some time to come.

The first Whaitua Committee established in the Ruamahanga area was initiated in December 2013 and is yet to set their first water quality limits at the time of writing this report. This means that discharges are only regulated through the resource consent process set out in the Resource Management Act 1991 which involves assessing effects of each individual discharge, rather than assessing the health and values of catchments as a whole and considering what collective regime of discharge would be permitted in order to

[1077] New Zealand Government. *National Policy Statement for Freshwater Management* (Wellington: New Zealand Government, 2014).

maintain water quality above a minimum standard. The consent also did not include conditions to ensure cultural health monitoring occurred. There was no explanation for how Greater Wellington Regional Council recognised and provided for the relationship of the hapū to the Lake in their decision as required under Section 6(e) of the Resource Management Act, and no assessment of the effects of the application to that relationship.

According to the officer's report, the consents were granted for a period of three years, a shortened term, 'to assess the effects of the discharge and inform decisions about upgrades to the wastewater treatment system'. It states that:

> 'the applicant has stated that the intent of the resource consent is to allow for monitoring to be undertaken and modifications to be made without causing technical breaches of consent conditions, triggering the need for a review of conditions, or triggering the need for a fresh resource consent application.'

The officer then states that they agree with the intent of the consent for that purpose. The report states that it is assumed that there is a small amount of seepage from the wastewater treatment ponds, however data needs to be collected as part of the conditioned monitoring programme to confirm this.

It is unclear why the Greater Wellington Regional Council did not insist that the Assessment of Environment Effects provided with the application didn't provide the assessment of the effects of the discharges prior to issuing resource consent. Under Section 88 of the Resource Management Act, an assessment of the activity's effects on the environment must be included in the application, however the consents were granted in this case before that full assessment could be provided, and the information that will be provided will demonstrate the effects retrospectively. It is also important to note that there was a period of two years from the date of lodgement until a decision was made and the consent was granted, in which that data could have been collected. It appears that in the absence of information necessary to assess effects, particularly where the consent is for a pre-existing activity, the default position of Greater Wellington Regional Council is to allow the activity to continue, rather than to halt the activity until the effects can be determined through some other method.

5.4.6 Case Study Twenty: Contamination of Waterways from Landfills in the Kāpiti Coast

Stormwater, or water that is collected from sealed surfaces is piped directly into rivers and streams, generally without any treatment in the inquiry district. As it flows through the catchment it picks up sediment, rubbish and a range of contaminants listed at the beginning of this section. Until recently, the discharge of stormwater has not required consent**.** In recent years, however, Kāpiti Coast District Council has held a "global network" resource consent to discharge stormwater to surface water.[1078]

As mentioned earlier, the Kāpiti Coast has an extremely high incidence of sites that are likely to be contaminated, with 182 sites in the Kāpiti Coast District being identified on Greater Wellington Regional Council's Selected Land Use Register (SLUR). Each individual "site" may include more than one property as their identification is associated with a specific historic or current land use, whose effects may apply to a collection of neighbouring properties.

One of the key contributors of contaminants to water comes from the existing and retired landfills in the district. Map 52 below shows the location of all existing and retired known landfills in the area. Landfills were historically designed with not much thought of their potential impact on waterways, which has proven particularly problematic in the Kāpiti area where the water table can be quite high. In recent years there has been more evidence provided on the effect of leachates from landfills seeping into ground and surface waters and then contributing to contamination of larger watereways.

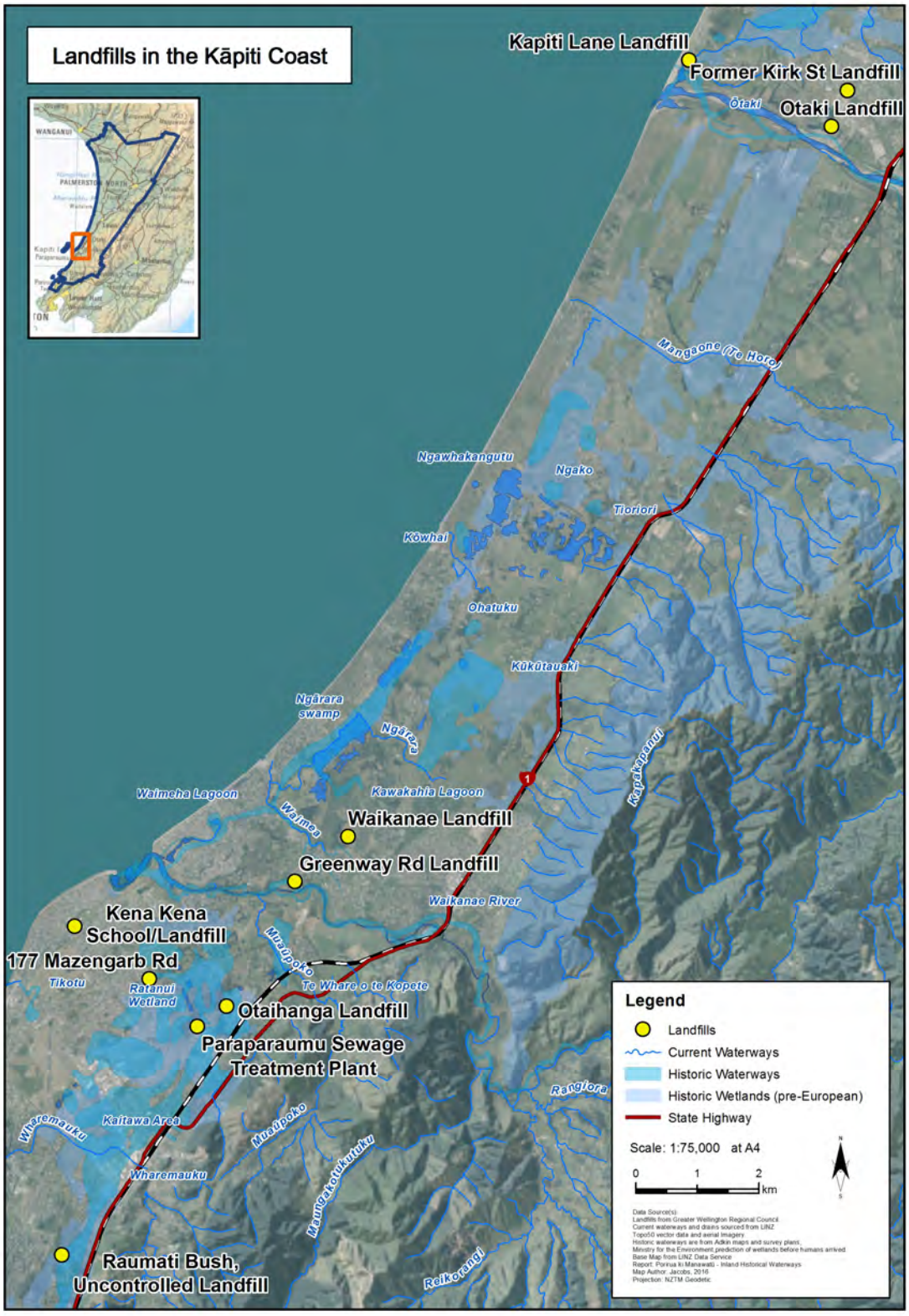
The Kāpiti Coast District Council Otaihanga Landfill site is one such landfill which produces leachates which have contaminated groundwater and surface water. Evidence of the levels of contamination have been provided through monitoring carried out to determine "baseline values" of different contaminants in waterways connected to the Otaihanga Landfill as part of the construction of the Mackays to Peka Peka motorway (M2PP). This data was collected between November 2012 to August 2013, and in the case of some monitoring locations three years of historical monitoring by the Kāpiti Coast District Council. The baseline values were determined in order to allow the M2PP project to monitor if both construction, and the stormwater effects of the motorway itself, cause

[1078] A Perrie, S Morar, JR Milne, and S Greenfield, *River and Stream Water Quality and Ecology in the Wellington Region: State and Trends* (Wellington: Greater Wellington Regional Council, 2012).

any changes to the baseline values, which would indicate that the project was potentially exacerbating the contamination effects of the landfill on waterways in the area.

It is worth investigating the effects that the motorway and other roading has had on water quality on the Kāpiti Coast, and claimants who have a particular interest in these effects can use the monitoring reports that are referred to here to provide themselves with further evidence of the motorway potentially having a significant impact on the baseline contamination levels that are reported here. However, the evidence provided here pertains to levels of contamination in waterways that are largely attributed to a single landfill as a case study to indicate the broader implications of territorial authorities having developed and managed landfills without protecting the aquatic environments that they are connected to.[1079]

[1079] New Zealand Transport Agency. *Approved Results of the Monthly Surface Water Monitoring Programme for the Otaihanga Landfill – February 2017* (Paraparaumu, 2017). M2PP-000-U-PLNM.

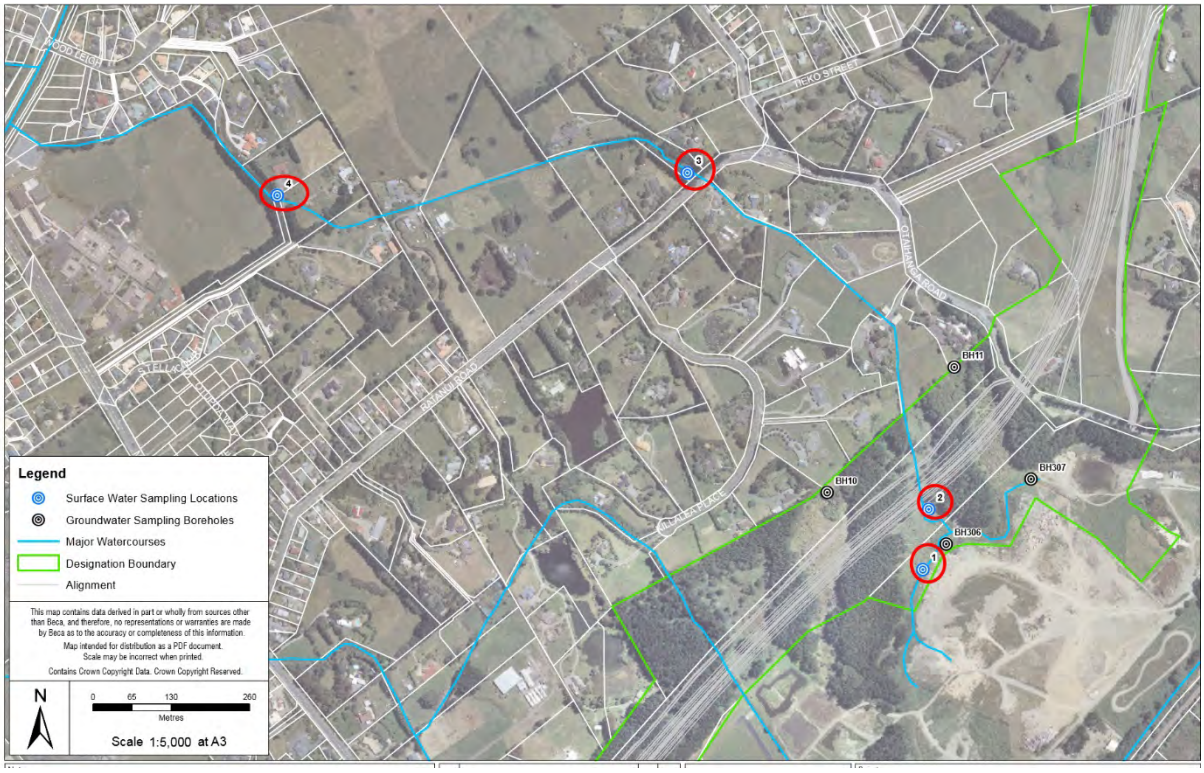


Map 54: **Landfills in the Kāpiti Coast, and historic waterways from 1896 and pre-European times.**[1080]

[1080] Created by Jacobs, courtesy of Crown Forestry Rental Trust.

Monitoring was conducted at four sites in connection with the Otaihanga Landfill ranging from the source of the contamination at the landill, to a watercourse that runs behind Paraparaumu College, which is received by the Mazengarb Stream, before this discharges at the estuary into the Waikanae River, as illustrated in Map 55:

- Site 1 – the Landfill Drain;
- Site 2 – the Wetland Drain;
- Site 3 - Ratanui Road; and
- Site 4 – Mazengarb right of way.



Map 55: **Monitoring sites for the Otaihanga Landfill.**[1081]

Table 2 presents the baseline values across a range of different contaminants for all four sites and compares these to the Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines for Fresh and Marine Water Quality which sets recommended trigger levels for different contaminants and describes the effects of contaminant levels on aquatic ecosystems..[1082] The bolded values indicate that a site

[1081] Ibid.

[1082] ANZECC, 'Paper No.4 Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Volume 2 Aquatic Ecosystems – Rationale and Background Information', in *National Water Quality Management Strategy* (Canberra, 2000).

exceeds the ANZECC trigger levels and outlined below is an indication of the implications of those contaminat levels being exceeded.

Table 2: **Water quality 'baseline values' at four sites connected to the Otaihanga Landfill.**

Contaminant	**ANZECC toxicity trigger**	**Site 1: Landfill**	**Site 2: Wetland Drain**	**Site 3: Ratanui Rd**	**Site 4: Mazengarb ROW**
Heavy Metals					
Total Aluminium (µg/L)	55	**1660**	**120**	**8195**	**4254**
Total Boron (µg/L)	370	**1260**	**1190**	186	137
Dissolved Cadmium (µg/L)	0.2	0	**500**	0	0
Total Iron (µg/L)	300	**27,000**	**6450**	**73,960**	**143,900**
Dissolved Lead (µg/L)	3.4	0	0	0	**2,170**
Dissolved Zinc (µg/L)	8	**27**	**39**	**283**	**22**
Ammonia-N (µg/L)	900	**151,900**	**55,600**	**5,630**	**3,570**
Nitrate – (µg/L)	700	**5300**	**7500**	180	**1600**
Suspended solids (mg/L)	50	**331**	**235**	**850**	**578**

- Aluminium is known to be a a gill toxicant to fish, to cause respiratory effects for fish, and to reduce the hatching effects of amphibians. It is known to cause chronic toxicity to fish at the levels observed across all monitoring sites.
- Ammonia is known to be toxic to insects. Levels observed at all sites have been determined to be acutely toxic to banded kōkopu, common bully, smelth, redfin

bully, īnanga, longfin and shortfinned elles and freshwater shrimp; levels observed at Site 1 are 200 times that which have been observed to cause this effect.

- Boron at levels observed at Sites 1 and 2 are toxic to macrophytes and algae.
- Cadmium is known to bioaccumulate in the flesh of marine and aquatic organisms such as mussels, oysters, fish, and dolphins. Research on the bioaccumulation of cadmium through the food chain has determined that in order to ensure human's don't consume more than the proposed maximum consumption levels of 10mg/kg, freshwater levels of cadmium should be limited to 0.2 µg/L. This has been exceeded by 2500 times that level at Site 2. The effects of cadmium consumption by humans are well documented, with renal tubular damage being the critical health effect. There is also sufficient evidence of cadmium to be classified as a carcinogen.[1083]
- Iron is known to be acutely toxic to aquatic insects and fish species at the levels observed at all sites. At 0.2 per cent of the levels observed at Ratanui Road, a reduction of hatchability of minnow eggs by 50 per cent has been observed. Iron may be found as colloidal suspensions which may smother benthic organisms.
- Lead has been observed to impair reproduction and cause spinal deformaties of freshwater fish such as trout in levels 11 per cent of what is observed at Site 4. Research has warned against human consumption of fish from rivers in a network connected to water ways polluted with lead as lead is considered a dangerous neurotoxin that bioaccumulates in the flesh of fish species.[1084]
- Nitrates create significant issues as they stimulate nuisance algal blooms and the eutrophication of waterways. They are also toxic to insects and freshwater molluscs at rates of 25 per cent that observed in Site 2.
- Suspended sediments indicate a range of potential problems; not least because they are the means by which contaminants are transported through aquatic systems, their most significant effect tends to be a reduction in light penetration through the water colum which effects photosynthetic activity of phytoplankton and vegetation and directly effect fish by clogging or coating gills which can kill

[1083] L Jarup, M Berglund, CG Elinder, G Nordberg, and M Vahter, 'Health Effects of Cadmium Exposure: A Review of the Literature and a Risk Estimate', in *Scandinavian Journal of Work and Environmental Health*, 24:suppl, 1998.

[1084] FP Arantes, LA Savassi, HB Santos, MVT Gomes, and N Bazzoli, 'Bioaccumulation of Mercury, Cadmium, Zinc, Chromium, and Lead in Muscle, Liver, and Spleen Tissues of a Large Commercially Valuable Catfish Species from Brazil', in *Biological Sciences*, 88(1), 2016.

fish if levels are high enough. In general they smother small organisms or their feeding appartus and are associated with a reduction of biodiversity. All four sites significantly exceed the trigger level and the site 3 levels have been observed at 17 times the recommended trigger levels.

- Zinc is likely to be chronically toxic to fish at levels less than 10 per cent of those observed at Ratanui Rd, and also bioaccumulate in the flesh of fish, creating significant risk of human consumption.

The rates at which these serious contaminants exceed the recommended trigger levels are extremely significant and are reason for serious concern regarding not just the health of the aquatic organisms, but the flow on effects to whānau, hapū and iwi who are at risk of consuming unhealthy concentrations of carcinogens and neurotoxins such as cadmium, lead and zinc if they wish to continue their traditional cultural practices of catching and consuming freshwater and marine organisms. It is also important to note that these levels of contamination are connected of one landfill in the Mazengarb catchment, which includes four landfills in total. There is currently no available monitoring of levels of contamination at the lowest reach of the Mazengarb that receives stormwater contaminated by leachate, or in the Waikanae River itself, which is the receiving body of the Mazengarb. There are then an additional three landfills in the Kāpiti area, which raises a question over the need to further investigate the potential connection between discharged stormwater contaminated with leachate and shellfish toxicity as observed in 2012 state of the environment reporting.[1085]

A number of claimants also raised questions about high incidences of cancer that had been observed on the Kāpiti Coast which they had already attributed to leachates from the soil entering waterways. The data presented here provides potential evidence for causality of chronic health issues such as cancer or renal failure in areas where people are consuming fish species, in particular molluscs and freshwater fish. The Kāpiti Coast area currently does not carry out monitoring of the rates of consumption of these species and there is a strong likelihood that the serious risks presented by these leachates into water are being overlooked by territorial authorities, and central government.

[1085] MD Oliver and JR Milne, *Coastal Water Quality and Ecology in the Wellington Region* (Wellington: Greater Wellington Regional Council, 2012).

5.4.7 Case Study Twenty One: Lake Horowhenua and Hōkio Stream Catchment

This case study examines how the interaction of drainage, toxic discharges to water and negligent Crown resource management has dismantled Māori economies. As noted in the report's introduction (section 1.2), a report for Muaūpoko claimants outlining their perspective in relation to Lake Horowhenua claims issues has been commissioned by the Waitangi Tribunal and has already been completed.[1086,1087] As such, this case study focuses on the perspective of Ngāti Raukawa, and of Ngāti Pareraukawa in particular, and their claims issues in relation to Lake Horowhenua and the Hōkio Stream.

Lake Horowhenua and the Hōkio Stream have always comprised one of the most significant catchments in the inquiry district due to their capacity to sustain large numbers of people from many hapū and iwi. Lake Horowhenua is the largest lake in the district and was estimated to have an area of 901 acres prior to any drainage.[1088] An account of Lake Horowhenua in the mid-1800s recalled by Rod McDonald in 1925, described it as pre-eminent in its beauty not just at the regional scale, but a lake considered one of the most beautiful in the world. Already by the date of his recollection in 1925, McDonald noted that the area had already undergone such significant change that someone seeing it for the first time then would not imagine its original beauty.[1089]

The outlet of the Lake runs into the Hōkio Stream. It meanders four kilometres from the lake to the sea. The hapū of Ngāti Pareraukawa, recall that when their marae, Ngātokowaru, was originally established in the 19th century on the southern banks of the Hōkio, the length of the stream was bush-clad. The stream had always been renowned for its abundance of fish and being able to provide fish sustainably for thousands of people year round, including native trout, freshwater mussel, freshwater crayfish, whitebait and flounder. The stream was of notoriety due to the quality, quantity, and health of tuna found in the stream and neighbouring whānau and hapū would travel to Hōkio to fish

[1086] P Hamer, *'A Tangled Skein': Lake Horowhenua, Muaūpoko, and the Crown, 1898-2000*, Wai 2200 document #A150, June 2015.
[1087] Bennion Law solicitors noted on behalf of claimants Muaūpoko Tribal Authority that their perspective differs in areas within this section and certain references used are in contradiction to that perspective. Personal communication, Emma Whiley, email during the Draft Report feedback stage, 20 June 2017.
[1088] GL Adkin, 1948.
[1089] RA McDonald and E O'Donnell, pp 17-20.

there.[1090] Tuna are abundant in protein and were historically a primary source of protein for iwi.[1091] The lake and stream were critical to the region and essential to the life of the people of Ngāti Pareraukawa.

The abundance of the Hōkio is also evidenced through the accounts of the 13 or more eel weirs that had been managed in the stream by Muaūpoko. These weirs were documented in detail by local archaeologist Adkin.[1092] Indeed, at the time when Muaūpoko were conquered by Ngāti Toa, the Hōkio Stream had been wide enough for Te Rauparaha to be able to manoeuvre his great war canoe all the way from the mouth through the headwaters and into the lake.[1093]

Archival files on Horowhenua No. 6 Block included a map of Wellington Land District No. 332, Village-Homestead Allotments, 870 acres, 1 rood, 27 perches, stating that it was 'first class land in the County of Horowhenua open for selection on lease in perpetuity'.[1094] An accompanying file note included a written schedule of the section blocks and the price/acre, with a note, that 'the Commissioner submitted plans and particulars of 13 lots in the Horowhenua East V.S. as per schedule below, which was duly approved'.[1095] This evidences the Crown's role in the planning and approval of Land Board decisions over land in the Horowhenua.

The township of Levin was well developed to the east of Lake Horowhenua by the turn of the century, and would gain borough status by 1 April 1906. There was a desire from the original planners of the town to have public spaces that provided for residents recreational enjoyment.[1096] The Horowhenua Lake Act was passed in 1905 to establish the lake as a public recreation reserve, under the control of a Domain Board out of recognition 'that the Horowhenua Lake should made available as a place of resort for His Majesty's subjects of both races' whilst recognizing the need 'to do so without unduly interfering

[1090] R Selby and P Moore, 'Nōku Te Whenua O Ōku Tūpuna: Ngāti Pareraukawa Kaitiakitanga', in *Māori and the Environment: Kaitiaki* edited by R Selby, P Moore, M Mulholland (Wellington: Huia, 2010), pp 37-42.
[1091] Personal communication, Rachael Selby, written comments provided during the Draft Report feedback stage, 23 July 2017.
[1092] GL Adkin, 1948, p 20.
[1093] RA McDonald and E O'Donnell, p 16.
[1094] Map of Wellington Land District No. 332, Village-Homestead Allotments, 27 May 1902. Archives New Zealand, Wellington, R24007373, LS-W1 380, Record 19345/4, Horowhenua No. 6 Block.
[1095] Written schedule of the section blocks and the price/acre, Horowhenua East V.S., approved, Land Board, 1/5, 1902. Archives New Zealand, Wellington, R24007373, LS-W1 380, Record 19345/4, Horowhenua No. 6 Block.
[1096] A Dreaver, *Levin: The Making of a Town* (Levin: Horowhenua District Council, 2006), pp 92, 114.

with the fishing and other rights of the Native owners'. The Act included provisions for the exercise of the powers and functions of a Domain Board under the Public Domains Act 1881, with one-third at least of the members being Māori, the governor to acquire land from native owners to use as boat-sheds and other buildings necessary to carry out the provisions of the Act, and importantly that:

> 'the native owners shall at all times have the free and unrestricted use of the lake and of their fishing rights over the lake, but so as not to interfere with the full and free use of the lake for aquatic sports and pleasures.'

The first record found of works in the Hōkio Stream is a letter from the Member of Parliament for the Ōtaki electorate, W.H. Field, to the Horowhenua County Council, writing in response to a decision notified in the Levin Chronicle on 13 December 1920 that the Council will 'clean out the Hōkio Stream outlet to the Horowhenua Lake'. Field writes to insist on the Council signing indemnity against any damages and costs in respect to the cleaning out, and advised that:

> 'care must be taken that the outlet shall not be so deepened as to reduce the normal level of the Lake, and that if any eel weirs have to be removed, they must be restored directly after the clearing of the outlet is completed.'[1097]

By the mid-1920s, Levin was a growing rural town with a population of 2360, including a considerable farming population.[1098] There was a strong desire by local bodies to support agriculture in the area and the lands surrounding Lake Horowhenua were constituted a land drainage district in 1925, through the Land Drainage Act 1908, under the control of the Hōkio Drainage Board. However, Ben White provides an overview of the implications of this in a section of his 'Inland Waterways: Lakes' report.[1099] As provided for under the provisions of the Act, the Hōkio Drainage District was able to be created by a majority of ratepayers petitioning the Governor requesting the district be constituted. In 1926, the Local Legislation Act was passed and contained provisions for the Hōkio Drainage Board to carry out drainage operations on lands adjacent to Lake Horowhenua and the Hōkio Stream.

[1097] WH Field, *Letter from W H Field Re Conditions for Cleaning of Hōkio Stream Outlet to the Horowhenua Lake*, 16 December 1920. Horowhenua County Council. Archives Central.
[1098] A Dreaver, 2006, p 167.
[1099] B White, 1998.

In the official letter from the Horowhenua County Council to the Governor-General petitioning him that the Hōkio Drainage District be constituted in 1925, a summary of the Commission held to determine if the District would be constituted is provided. It is recorded that a Mr Rere Nicholson of Ngāti Pareraukawa had notified the Stipendiary Magistrate 'that he and several other Natives would be objectors.' It then states that Mr Nicholson appeared in person at the Commission on behalf of the Native owners bordering the Hōkio Stream and that 'after considerable informal discussion by the side of the stream it was agreed that Mr Rere Nicholson should be given an opportunity of discussing a proposed form of settlement with the Natives interested'. There is no record of the settlement reached, which according to the letter ensured that there were no longer any objections. However, the tenor of the settlement can be inferred in that the letter goes on to recommend that the District's Board of Trustees shall be vested with the care of the 'the slow-flowing waters of the short length of the Hōkio Stream', because this is where it is hoped 'the obstructions to the proper outfall for the drainage area lie principally', and that 'there is considerable fall in the stream for some distance below such length.' The letter recommended that focusing on the 'short length' of the stream, should 'adequately meet the requirements of the Board', that being drainage of the lake, and 'at the same time permit the Natives to enjoy nearly the whole length of the stream as heretofore.'[1100]

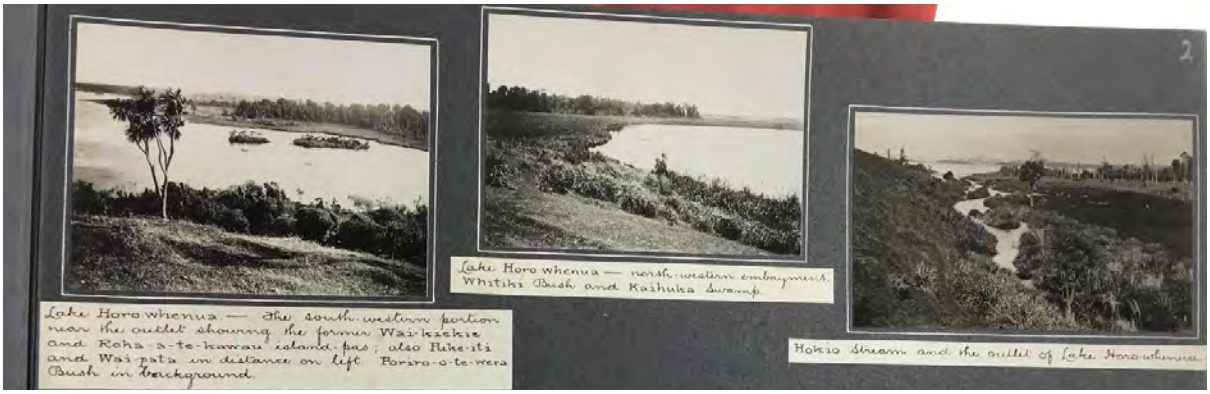


Figure 35: **Images of Lake Horowhenua and Hōkio Stream 1927.**[1101]

According to the Act, proclamations could provide for: the widening or deepening of Hōkio Stream; regulating the removal and replacement of eel weirs; regulating works that

[1100] RM Watson, "Letter Regarding Hōkio Stream." Ed. Council, Horowhenua County1925. p.24-5 of *Wirokino Riding: Hōkio Stream*. Central Archives file HDC00018:2/4/1.

[1101] GL Adkin, "Lake Horowhenua and Hōkio Stream." *Alexander Turnbull Library*. Ed. 25, Adkin Album1927. http://natlib.govt.nz/records/22348651.

would lower the lake level; or protecting existing rights of users of the lake. Under Section 53(1) of the Act, any proclamations made under the Land Drainage Act 1908 in respect of Hōkio Stream were to contain such provisions as were necessary to protect Māori fishing rights and public use rights. The Drainage Board recommenced its work, lowering the lake by one metre below its natural level and modifying the stream was modified to create a narrow, deep, and fast flowing channel.[1102]

The drainage in the area ended up having significant impact on the tuna fisheries of the area:

> 'During the course of a 1934 inquiry into matters concerning Lake Horowhenua, representatives of Muaūpoko stated that where there had once been 13 eel weirs on the Hōkio, only two survived after this first phase of work undertake(n) by the Drainage Board. According to counsel for the Muaūpoko owners at the inquiry, the Drainage Board commenced this work before proclamations were issued. The claim was made that 'the board trampled on native rights and then got legislation to justify their actions. As well as affecting the eel fisheries of the Hōkio Stream, the actions of the Drainage Board caused the lake level to be permanently lowered. The lake margin, once muddy and heavily vegetated, became arid and stony. In this way, an important kākahi, eel, and flax habitat was destroyed.'[1103]

In addition to the cultural, ecological, and economic effects of the drainage of the area, local Māori then came into conflict with local Pākehā farmers regarding rights to the dewatered areas. White refers to evidence of the farmers assuming rights to graze stock and burning and ploughing under flax in those areas. [1104] This had an additional economic effect on people of Ngāti Pareraukawa who were unable to derive an income from the sale of flax sourced from the lake margin.

Ngāti Pareraukawa provide accounts of the effects of further drainage works in the Hōkio Stream in 1947. The stream was dredged and straightened further, and the lake was lowered another two metres to increase drainage, particularly west of the lake. They also note that a large number of customary eel weirs were removed. During this period of

[1102] SW Gane, DM Brown, and MK Holland, *Report of Explanation to the Hōkio Classification* (1979), p 2. Central Archives.
[1103] Ibid.
[1104] B White, 1998.

agricultural intensification, Ngāti Pareraukawa also noted the effects of increased fertilizer and other nutrients entering into the Arawhata Stream, which feeds Lake Horowhenua from the south. These effects included algal blooms and weed growth in the Arawhata Stream and then in the lake. Previously the Arawhata had played an important role of providing clean water to the lake to flush it out, however this function was now limited by its decreased water quality.[1105]

In January 1949, a scientific study of the lake was conducted by Fisheries Research Laboratory and DSIR. At this stage only light weed growth was found and no algae blooms were found in the lake. Good populations of long- and short-finned tuna, bully, and trout were found. Carp was also present in the lake.[1106] Then in 1953, the Levin Borough Council introduced a sewerage system and began piping sewage into the lake. Accounts following the beginning of the operation of the sewerage system tell of toilet paper and faeces floating around people in the stream as they attempted to set their hīnaki to catch tuna for the season, and having to kick faeces aside to get to the hīnaki when they collected them. This affectively made living off the stream, or even entering it no longer possible. This began a devastating period for Ngātokowaru marae as the hapū all but abandoned the marae whilst appealing to the Council to remove sewage from the lake and stream for the next 20 years. This fundamentally changed the function of the marae; it was no longer a residence and focal point for everyday life of the community, instead its use was limited to only tangihanga. Due to the stream no longer being used to sustain the livelihoods of its people, the knowledge of the stream and how to source food from it was also no longer passed down. Ngāti Pareraukawa have been protesting the use of the lake and stream for sewerage discharge since its introduction in 1953.[1107]

In 1956, the Reserves and Other Lands Disposal Act was passed, including Section 18 pertaining to Lake Horowhenua. The Act determined that

> 'the bed of the lake, the islands therein, the dewatered area, and the strip of land one chain in width around the original margin of the lake to be and to have always been owned by the Māori owners'.

[1105] R Selby and P Moore, 'Nōku Te Whenua O Ōku Tūpuna: Ngāti Pareraukawa Kaitiakitanga', in *Māori and the Environment: Kaitiaki* edited by R Selby, P Moore, and M Mulholland (Wellington: Huia, 2010), p 48.
[1106] A Dreaver, *Levin: The Making of a Town* (Levin: Horowhenua District Council, 2006), p 272.
[1107] R Selby and P Moore, 2010, pp 43-45.

The bed of the Hōkio Stream, excepting any part that had been legally alienated by its Māori owners was also deemed to be owned by Māori. However, the Act secured public access to the 13-acre reserve, the chain strip, the dewatered area and the surface waters of the lake. It also declared the surface of the lake a domain and secured public access to it. It provided for the constitution of a Domain Board which would include four members of Muaūpoko and three Pākehā representatives. This indicates that there was an assumption on the part of the Crown (due to the Native Land Court process and proceedings surrounding the Horowhenua Block sale) and the Board that Muaūpoko were the Māori owners of the Lake and the Stream.[1108] This is inconsistent with the general understanding that Muaūpoko had been conquered and offered refuge by the iwi Ngāti Raukawa, not ownership.[1109] The land block research project for this inquiry may be able to clarify how the granting of these rights came about and if they are valid. Nepia Winiata of Ngāti Pareraukawa was appointed as one of the three 'Pākehā' representatives.[1110] This is evidence that Ngāti Pareraukawa was recognised as having an important interest in Lake Horowhenua. By not identifying Ngāti Pareraukawa as owners and granting them one Pākehā seat on the Domain Board, that prevented them from having a recognised iwi interest and influential input into the management of the lake; along with little to no control over the outcomes and decision making of the management that the entire community were to continue to suffer from for the decades to follow.

Finally, the Act abolished the Hōkio Drainage Board and transferred powers and jurisdiction to the Manawatū Catchment Board.[1111] It is important to note that under the amendment of the Horowhenua Lake Act 1916, the quotient of Māori on the board was changed to a maximum of one-third, ensuring that Māori would always be a minority in decision-making.[1112]

[1108] For more detail refer to R Boast, *Ngāti Raukawa: Custom, Colonization and the Crown, 1820-1900*. Waitangi Tribunal Report, forthcoming.

[1109] RA McDonald and E O'Donnell, pp 17-20. See also Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Site Visit From Tūkorehe Marae to Surrounding Areas, Wai 2200, #4.1.8(a), 23-24 June 2014; Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Hui, Tūkorehe Marae, Wai 2200, #4.1.8, 24-27 June 2014; Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Hui, Raukawa Marae, Ōtaki, Wai 2200, #4.1.9, 17-19 November 2014; and Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Hui, Whakarongotai Marae, Waikanae, Wai 2200, #4.1.10, 22 April 2015.

[1110] Personal communication, Rachael Selby, written comments provided during the Draft Report feedback stage 23 July 2017.

[1111] B White, pp 83-84.

[1112] Ibid, p 87.

In 1956, a weir was installed at the outlet to the Hōkio Stream to control flow out of the lake,[1113] and by 1959, the Manawatū Catchment Board proposed the Hōkio Drainage Scheme to lower the level of Lake Horowhenua further and to conduct works regarding the Hōkio Stream below the Lake outlet. The scheme was requested by the Lake Horowhenua Domain Board. At this time the lake covered an area of approximately 730 acres (2.95 km^2), and was fed by:

> 'the Arawhata Drain on the South, the water races of the Horowhenua County, Levin Borough drains and sewerage outfall on the East, the Mairua Drain on the North, the natural run-off of all land around the lake, and the natural underground seepage from the shingle strata East of the Lake.'[1114]

By 1975, it must have become apparent to the Manawatū Catchment Board that Lake Horowhenua was experiencing serious water quality issues as it commissioned a report on the conditions of the lake and the factors affecting it to inform discussions around its restoration. Section 26A of the Water and Soil Conservation Act 1967 provided for authorities to carry out such investigations for the purposes of determining the classification of water quality and ascertaining information regarding cause, effect, type and extent of discharges and to determine who controls discharges and whether they should be further controlled or abated. The report provides some background on the implementation of the Hōkio Drainage Scheme. A concrete weir structure had been adopted as a means to control lake levels, and three eel weirs had been identified to be demolished and replaced 'with the permission of the Māori owners', although it does not identify who they are and if they are Muaūpoko or Ngāti Pareraukawa. It also states that no further or other types of weir will be permitted without the sanction of the Board. The Board had proposed to lower the lake further to a level that they estimated would increase production in the area by 25-30 per cent. They also identified that this would provide a benefit to the Borough of Levin in that once lowered, the lake would have the potential to hold a larger volume for the disposal of the treated sewage effluent. This benefit was

[1113] Lake Horowhenua Trust, *He Hokioi Rerenga Tahi: The Lake Horowhenua Accord Action Plan 2014 – 2016* (Levin: Lake Horowhenua Trust, 2013), p 12.
[1114] Manawatū Catchment Board, *Report on the Proposed Hōkio Drainage Scheme and Control of Lake Horowhenua Level* (Palmerston North: Manawatū Catchment Board, 1959). Central Archives.

deemed significant enough that it was proposed that the Borough pay a fixed percentage of the total rates levied for the Scheme.[1115]

The report presents the results of the first available in-depth surveying and scientific description of water quality of the lake, from a period of time in 1975-76. At the time of the survey, the average rate of discharge of treated sewage from Levin Borough was 4, 546, 000 litres per day, or 52.6 litres per second, this is estimated to account for 8 per cent of the total flow from the lake into the Hōkio Stream, noting that 21 per cent is unaccounted for in the report's assessment. Also, the report notes that no analysis of flow or quality of Levin stormwater has been undertaken.[1116]

The results show that algae was found in abundance in the lake. In November 1975, the filamentous algae *Cladophora* was plentiful along with three other species were found of filamentous algae. A range of different diatoms were found. The report also noted the spread of algae over half of the area of the lake surface and submerged weed over much of the remainder by February. The cyanobacteria *Microcystis* was such through February and March that scums were forming about the eastern shore. Floating plants were also increasing in numbers. The general condition of the lake was found to be highly eutrophic; rich in nutrients supporting a dense plant population, the decomposition of which kills off animals by depriving them of oxygen. The warm temperatures and high nutrient input created conditions for this proliferation of algae and aquatic plants. Oxygen concentrations ranged from very high during the day as the plants were respiring to very low at night. The results showed the lake to be highly alkaline which is also attributed to the high level of photosynthesis activity from algae that remove large amounts of CO2 from the lake. The lake was also tested for the concentration of *E. coli* which is used to indicate the degree of faecal contamination and likelihood of pathogenic bacteria being present. The values were low with 0-70 *E.coli* per 100 millilitres being detected. The report noted that in light of the very high concentrations in many inputs into the lake, that the algae and other lake conditions must have been exerting a great inhibiting effect.[1117]

[1115] GG Brougham and KJ Currie, *Progress Report on Water Quality Investigations Lake Horowhenua* (Palmerston North: Manawatū Catchment Board and Regional Water Board, 1976), p 1-3. Central Archives.
[1116] Ibid, pp 8-11.
[1117] Ibid, pp 12-15.

At the time of the writing of the report, the Lake held a "C" classification under the Water and Soil Conservation Act 1967. The Act contained a 'Schedule of Standards for Class C Waters' which set out minimum standards for "C Class" waters. The classification allowed for pH within a range of 6.5 to 8.3, as observed within the lake, except when due to 'natural causes'.[1118] Under the Act, the raising of pH resulting from increased photosynthesis of algae may be considered 'natural', which removed any obligation on the Manawatū Catchment Board to address the issue of high pH in the lake.

The transparency of the lake was also tested by taking secchi disk readings; these indicate at what depth black and white quadrants on a 20cm disk cannot be distinguished. The readings in the lake could not be completed from depths of 0.6 metres, with one reading being as low as 0.35 metres. These were considered significantly smaller than those in other New Zealand lakes at the time, and lower than a previous reading of 0.75 metres that had been taken in the January 1949 study. The lack of transparency was also a result of the density of living organisms such as phytoplankton dead and dead organic material, as well as particulate inorganic material and dissolved coloured matter leached from surrounding peat.[1119] These results indicate that the lake did not meet the "Class C" requirement that 'the natural colour and clarity of the waters shall not be changed to a conspicuous extent.'[1120]

Total phosphorus content of the lake was also routinely measured at extremely high rates. The average total phosphorus content of the lake during the study was 1014 kilograms or 0.35 grams per square metre. The report attributes the increase in phosphorus concentration to biological activity in the lake and the high nutrient inputs from cowsheds and sewage. Further analysis of the phosphorus in the lake found that 82 per cent of the phosphorus present was attached to particles, which would be sediment or algae. Nitrate and ammonia were measured at an average of 0.058 and 0.11 milligrams per litre respectively. The report notes that the high ammonium concentrations compared with nitrate concentrations is abnormal for well aerated lakes, and that this is possibly a result of high respiration rates. There was limited surveying of aquatic fauna beyond rotifers and protozoa. Freshwater shrimp were abundant amongst the weed, and many black swan and ducks were noted. Some black shag, white faced heron and pied stilts were found.

[1118] Schedule 3, Water and Soil Conservation Act 1967.
[1119] GG Brougham and KJ Currie, 1976, p 15. Central Archives.
[1120] Schedule 3(e), Water and Soil Conservation Act 1967.

Due to the poor water clarity, limited fish observations were made; carp were observed and eels were known to be plentiful. Several dead eels were noted about the domain during late March but the cause of death was undetermined.

The report failed to determine if the lake met "Class C" requirements (c); that the waters shall not be tainted so as to make them unpalatable, nor contain toxic substances to the extent that they are unsafe for consumption by humans or farm animals, or (d); that there shall be no destruction of natural aquatic life by reason of a concentration of toxic substances. However, it seems questionable that the water in the lake would be safe for consumption by humans, and that there had been destruction of natural aquatic life, but not thorough enough investigation as to whether the cause of this was toxic substances. The report concludes that the overall condition of the lake has significantly reduced the aesthetic, recreational and other values of the lake. Whilst not made explicit, the conditions certainly also significantly reduced the economic and other values to tangata whenua.[1121]

The report then analyses the inputs to the lake. The Manawatū Catchment Board North drain received untreated cowshed effluent and had: dissolved oxygen levels of nil-3.0 milligrams per litre; *E. coli* concentrations of between 500-79000 per hundred millilitres; average suspended solids of 18.8 milligrams per litre; average ammonium levels of 8.3 milligrams per litre; and average phosphorus concentrations of 0.65 milligrams per litre. The 'Pa' drain, which received cowshed effluent from around the Kawiu Pā area was observed to be heavily polluted; it ceased to flow in January, when cowshed effluent was observed building up in the stream bed. When it was flowing, dissolved oxygen was measured at nil, and *E. coli* levels were measured as being between 13000-2780000 per hundred millilitres during the period of observation. Average nitrate concentrations were 2 milligrams per litre, average ammonia concentrations were 65 milligrams per litre, and average phosphorus levels were 8.0 milligrams per litre. The Levin Borough treated sewage discharge into the lake reported: *E. coli* levels of 1400-3300 per hundred millilitres; average nitrate concentrations of 2.2 milligrams per litre; average ammonium

[1121] Ibid, p 16-18.

concentrations of 19.15 milligrams per litre; and total phosphorus concentrations of 4.9 milligrams per litre.[1122]

The investigation found that Lake Horowhenua was filling up with silt and sediment and highlighted the Arawhata drain as a significant contributor of this. This drain was managed by the Manawatū Catchment Board as part of the Hōkio Drainage Scheme which drains a relatively large area of farmland, including swamps and peat swamps. The drain contributes 91 of the total 232 kg of sediment a day to the lake. There was an estimated 2.6 million cubic metres of silt in the lake. The report also notes that the weir that had been constructed as part of the Hōkio Drainage Scheme to control the level of the lake was likely to have aggravated the natural process of silt accumulation within the lake. These sediments store a large amount of nutrients which can be slowly released over time. The report proposed that the silt could be removed by suction dredge.[1123]

In its analysis, the report stated that a minimum phosphorus input of at least 1465 kilograms per annum would be required to cause the observed eutrophic conditions. However, a conservative estimate of 10,007 kilogram per annum phosphorus was reported as input into the lake with over 80 per cent of that coming from the Levin Borough sewerage discharge. The Hōkio Stream outlet water quality was also analysed to reflect the condition of the lake. It notes that the Hōkio Stream is used extensively for eel fishing. The study reported: dissolved oxygen levels of 7-12 milligrams per litre, temperatures of between 18-22 degrees; and carrying 633 kilograms of suspended solids a day. The report identified that the removal of phosphorus input from the sewage discharge was the most obvious and significant step towards restoring the lake. The two options for this proposed was the spraying of the discharge over land, or the diversion of sewage discharge to the lake outlet, that being the Hōkio Stream.[1124]

The report concluded that the restoration of the lake would be expensive and that the value of the lake needs to be related to that cost in order to decide whether restoration is worthwhile. However, it stated that:

> "If restored, the lake could become an asset to the area. If not, the deterioration of the lake will become a liability. Continuation of the eutrophication process will

[1122] Ibid, pp 23-26.
[1123] Ibid, pp 36-37.
[1124] Ibid, pp 28-29.

> lead to increased blooms of algae (including poisonous blue-green algae), visual and odour problems, further weed encroachment and, ultimately, the conversion of a lake to a swamp. This will seriously affect the drainage of the area, eeling, and other activities. If the lake is to be restored, then work needs to be commenced immediately, as the continuation of present trends will make restoration more difficult and expensive in the future."[1125]

The year following this report, the Lake Horowhenua Steering Committee had requested that the Lake Horowhenua Technical Committee formulate a case for an 'X' classification to the Lake.[1126] Under Section 26C(5) of the Water and Soil Conservation Act 1967:

> 'In classifying any area of natural water the Authority may, by adding the symbol 'X' to the classification, indicate that the area of water in respect of which the symbol is added is sensitive to enrichment.'

The Technical Committee comprised a Chairman from the Manawatū Regional Board, two members from the Levin Borough Council, one member from the Horowhenua County Council, two members from the Public Health Section, Ministry of Works and Development, and two members of the Department of Scientific and Industrial Research. There were no representatives from Ngāti Pareraukawa or Muaūpoko. In making a case for the 'X classification, a report was produced in 1978 on Lake Horowhenua's condition, nutrient budget, and future management.

By 1978, phosphorus inputs had increased further to 10,600 kilograms per year, with the proportion of inputs from the Levin Borough Sewage having increased to 9,140 kilograms per year, which was due to the limiting of cowshed effluent as a source of nutrient since the previous report. This report also repeated the recommendation that diversion of the sewage round the lake, with a discharge directly into the Hōkio Stream, as the most viable option for lake restoration. It recommended that an application for a right to discharge be made at the earliest opportunity. It recommended that all possible steps be taken to eliminate or reduce the bacteria entering the Hōkio Stream from other sources. It also recommended that stock be excluded from the lake, by creating a 'stock free zone' around the lake. Secchi disk readings were conducted again to measure the

[1125] Ibid, p 39.
[1126] Lake Horowhenua Technical Committee, *Lake Horowhenua; Current Condition, Nutrient Budget and Future Management* (Levin: Lake Horowhenua Steering Committee, 1978), p 1. Central Archives.

transparency of the lake. Through the survey period, readings varied from 0.9 metres to 0.2 metres in summer, during algae bloom. It was reported again that this transparency was 'very much less than in other New Zealand lakes' and highlighted that transparency had decreased even further from the 1975-76 survey.[1127]

The report noted that the lake was estimated

> 'to contain 650-700 tonnes of eels with a probably sustainable yield of 100-150 tonnes per year. An eel processing plant in Levin processes up to 400 tonnes of eels per year, almost all of which are exported'.

It noted that

> 'the lake and its environs have a particular significance to the Māori people of the region as well as being a major source of eels and other foods, it has important associations.'

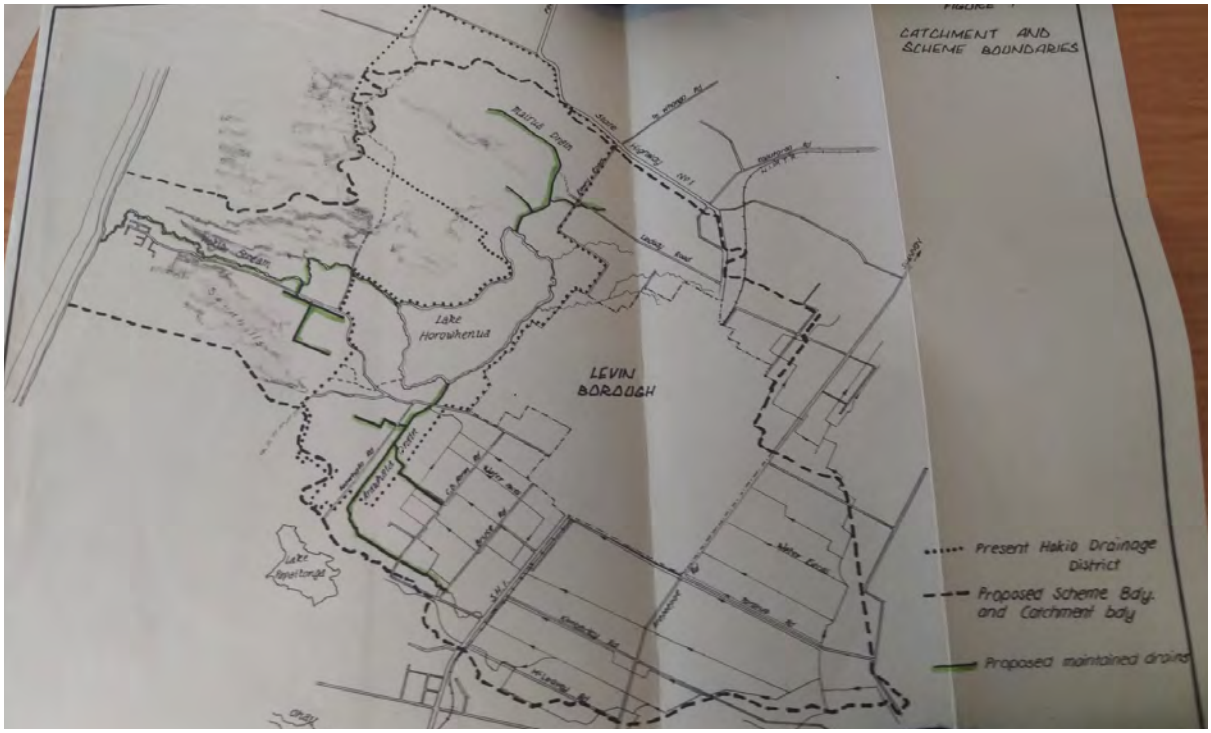
Nine kāinga or pā have been built on or near the lake edge and a further six on man-made islands in the lake (see Adkin Map VII, in Appendix VI). It noted that inter-tribal activity occurred in the area and that the attraction of the lake as a food source had played a significant part in that and that 'most of the uses and values cannot be expressed in monetary terms making a cost/benefit analysis virtually impossible.'[1128]

It was not possible to find minutes of the Lake Horowhenua Steering Committee's receipt of the report, however the case for the 'X' classification is clear from the Technical Committee's report.

The following year, in 1979, a report was also produced by the Hōkio Drainage Board that proposed to expand the Hōkio Drainage District to a larger catchment and scheme body. By including more properties within the Hōkio Drainage District, the Board would be able to accrue more rates, with the reason for this being to generate more funding to better address the management issues with Lake Horowhenua. Map 54 below shows the areas that were proposed to be included in the new catchment and scheme body which the report suggested would require 'a very high standard of drainage and flood control'. The areas that extended north and south of Lake Horowhenua were low-lying peat swamps

[1127] Ibid, pp 3-4, 7.
[1128] Ibid, pp 5-6.

used for dairy farming, whilst other land south and south-east of Levin was an intensively market gardened area. The farming in the north and south was dependent on 'adequate drainage and the control of Lake Horowhenua at its statutory fixed water level.' Under the Reserves and Other Lands Disposal Act 1956, Lake Horowhenua was to be maintained by the Manawatū Catchment Board at 9.145 metres above mean low water spring tide, Foxton Heads.[1129]



Map 56: **Present Hōkio Drainage District (1979) and Proposed Scheme and Catchment Body.**

The report recommended that a comprehensive scheme be drawn up to present the inter-relationships between flooding and drainage, water quality, weed growth, recreational use of the lake, and statutory control of the lake level. It recommended that the Manawatū Catchment Board seek support from the various local authorities and other bodies concerned and approach Government to provide special finance for the preparation of a comprehensive scheme. The approach for special finance would be addressed to the Ministers of Health, Recreation and Sport, and Works via the Water and Soil Division. It noted that water quality aspects of lake management were being coordinated and directed by a Steering Committee comprising of representatives from the Catchment Board, Regional Water Board, Levin Borough Council, Horowhenua County Council,

[1129] Gane, Brown, and Holland, p 2. Central Archives.

Horowhenua Lake Domain Board and Trustees for the Māori owners, referring to Muaūpoko, but again with no involvement from Ngāti Pareraukawa.[1130] The Muaūpoko and Pareraukawa Action Committee established in the mid-1970s was convened to work towards eliminating sewerage from Lake Horowhenua, and was led by Ran Jacobs of Ngāti Pareraukawa.[1131]

After the series of reports, and consistent pressure from the Muaūpoko and Ngāti Pareraukawa Action Committee the Manawatū Catchment Board convened a hearing in November 1979 to hear proposals on what to do about the water quality issues with the lake. The Board had initially adopted the recommendations of the reports; that the discharge would be made directly into the Hōkio Stream instead of the lake. Ngāti Pareraukawa objected to discharge to the Hōkio Stream and submitted that the sewerage could be discharged to land rather than water.

The Raukawa Trustees, on behalf of the iwi of Ngāti Raukawa, wrote the following to the Horowhenua County Council:

> ‘It is unlikely that any farmer would willingly have his land as an outlet for sewage with or without prior consultation…The Raukawa Trustees comprise sixty-one members who represent twenty one tribes and subtribes between the Rangitikei River and Porirua, including Ngāti Pareraukawa who are based at Ngātokowaru Marae on the Hōkio Stream. The Trustees are in full support of the efforts of Ngāti Pareraukawa to protect their sources of food.’[1132]

As the Council struggled to resolve the issue of the lake, the Muaūpoko and Ngāti Pareraukawa Action Committee had lodged an objection to the New Zealand Planning Tribunal asking that not just the lake but also the Hōkio Stream be classified as Class X:

> ‘It is the same water system, the stream is an important source of food for Māori people and we are concerned too that the beach should preserved as cleanly as

[1130] Ibid, pp 4-5.
[1131] Personal communication, Rachael Selby, written comments provided during the Draft Report feedback stage, 23 July 2017.
[1132] A Dreaver, 2006, p 273.

possible so that there is no danger to shellfish. We don't want pollution diverted from the lake straight into the stream.'[1133]

However, this appeal was rejected in 1980 on the technical grounds that the organization had not appealed earlier in the process of the classification of the lake.[1134]

The local iwi perspective is that only through the persistence and actions of the Muaūpoko and Pareraukawa Action Committee were they successful in 1984 in eliminating sewerage from entering their significant waterways.[1135] Eventually, the Council found that the Catchment Board's conditions required for discharge directly into the stream could not be met, so by 1984 the Council's consultants had identified a deep landlocked hollow known as 'The Pot', in the dunes south of the marae where the discharge could be piped. The Board finally adopted a new proposal to carry the discharge to 'The Pot', that being the dunes south of the marae, where it has been discharged since 1987.[1136]

The new millennium brought a new challenge to water management in the catchment when the Council expanded a local dump in Hōkio in 1975.[1137,1138] Then again it was expanded in 2004 to a district-wide landfill to cater for Foxton, Tokomaru, Shannon, and Levin, and later it began accepting waste from the Kāpiti Coast District Council. Many Hōkio locals, including Ngāti Pareraukawa, made complaints about non-compliance of the landfill which instigated a formal investigation by the Parliamentary Commissioner for the Environment. This investigation found 'inadequate capping of old landfill with quantities of refuse remaining exposed resulting in the forming of leachate.' This leachate was found to be discharging to the Tatana drain, a stormwater drain, and was in breach of a number of conditions of the consents the District Council held to manage the landfill,

[1133] Mr DW Moore, Deputy Chairman, Horowhenua County Council, in anonymous, 'Reclassification Protest Spills over to Stream', in *The Chronicle* 11 July, 1980, p 10.
[1134] Anonymous, 'Pressure Groups Knocked Back on Stream Move', in *The Chronicle* 16 August 1980.
[1135] Personal communication, Rachael Selby, written comments provided during the Draft Report feedback stage 23 July 2017.
[1136] Ibid, p 273-274.
[1137] For further details on the history of the Hōkio landfill and its impacts, please refer to V Wood, G Cant, E Barrett-Whitehead, M Roche, T Hearn, and M Derby, *Environmental and Natural Resource Issues Report.* CFRT commissioned report, forthcoming.
[1138] Date provided by personal communication, Rachael Selby, written comments provided during the Draft Report feedback stage, 23 July 2017.

and to be breaking out, causing contamination of the Tatana drain and the Hōkio Stream.[1139]

By 2010, the Lake had become hypertrophic, being the worst category for this measure and was ranked the 7th worst out of 112 monitored lakes in New Zealand. The highest concentration of nitrogen was coming from the Arawhata Stream; which had at some time been ranked as having the second highest median nitrogen concentration in the country, and the Patiki Stream, which was also ranked as having the fourth highest nitrogen concentration in the country. The cyanobacteria blooms gave cause to close the lake to recreational users over the summer due to concern that the conditions could be lethal to small children.[1140]

Eventually the pressure on the Horowhenua District Council to address this became so great that Horizons Reginal Council, the consenting authority, served notice on the Horowhenua District Council in 2015 that it would review the conditions of a series of resource consents associated with the Levin Landfill. These included consents to discharge solid waste, liquid waste, and leachate onto land, and to discharge stormwater to land that may enter water. This provided locals and iwi an opportunity to make submissions to a hearing on the effects of landfill and its compliance with the conditions set out in the landfill's consents. Representatives of Ngāti Pareraukawa, Rachael Selby and Pātaka Moore, raised concerns about toxic leachate and other treated discharges going into the Hōkio Stream and the adverse effects of this on the local eel population and stream health. The Horowhenua District Council has remained in breach of consent conditions through to 2017.[1141] Moore also provided evidence that contamination had been found in groundwater in bores at Hōkio Beach. Phillip Taueki of Muaūpoko raised concerns about the need for improved monitoring of the landfill, and concerns about treated waste water being irrigated to land.[1142]

[1139] Parliamentary Commissioner for the Environment, *Levin Landfill Environmental Mangement* Review (Wellington: Parlimentary Commissioner for the Environment, 2008), p 25.

[1140] Lake Horowhenua Trust, 2013, pp 8-10.

[1141] Personal communication, Rachael Selby, written comments provided during the Draft Report feedback stage, 23 July 2017.

[1142] Manawatū-Wanganui Regional Council. *Commissioners Decision on a Review of Resource Consent Conditions and an Application for Change of Resource Consent Conitions Both Relating to the Levin Landfill Operated by the Horowhenua District Council.* Palmerston North: Manawatū-Wanganui Regional Council, 2016, p 36.

Unfortunately for iwi, the review was limited in that it had to focus on the compliance of operation to specific consent conditions, and identifying any critical information that had not been considered or available to previous decision-makers in the issuing or review of specific consents. That effectively meant that because the issuing and review of the original consents for the landfill had previously involved hearing and considering those same concerns about what were described as "cultural effects" presented by iwi, the concerns were thought to be already addressed in that the conditions of the consents had been developed to limit such effects. Therefore, the hearing determined that many of the issues relating to leachate, water quality, input to management, monitoring, and non-compliant waste streams raised by iwi were outside the scope of the review because it was not new information, and that the hearing had no jurisdiction to consider them. Within that limited scope, the hearing panel was able to determine that the water quality information demonstrating that leachate was entering the Tatana Drain would not be considered or made available to previous decision makers. Also placed outside of the review was the fact that the presence of the leachate in the Tatana Drain that flows directly into the Hōkio Stream was culturally offensive.[1143]

The hearing panel's means of addressing this was to adopt conditions that are expected to intercept leachate moving off site and ensuring tangata whenua involvement in the 'Neighbourhood Liaison Group' to promote cultural values. Ultimately, the decision determined that the submissions on cultural monitoring were beyond the jurisdiction of the hearing, with the panel insisting their decision that the new or changed monitoring and compliance requirements they have adopted 'will help to address the physical effects that give rise to cultural concerns', whilst recognizing that the decision 'does not, and cannot, address all the issues of concern to tangata whenua, but such is the constrained nature of the review process.'[1144] In 2017, Horizons Regional Council presented a follow-up notice (from 2015) of non-compliance by the Horowhenua District Council in regards to the Hōkio landfill consent conditions.[1145]

As a whole, Crown management of Lake Horowhenua, Hōkio Stream, and other catchment tributaries has permitted almost 100 years of destruction and pollution. The

[1143] Ibid. pp.37-8
[1144] Ibid, pp 38-39.
[1145] Personal communication, Rachael Selby, written comments provided during the Draft Report feedback stage, 23 July 2017.

assault on the quality of the water and the communities of species that live in the catchment has been multi-faceted and relentless. Initially, the interests of the agricultural industry were valued over that of cultural interests. From the 1950s, the Crown accepted the total degradation of Lake Horowhenua, the Hōkio Stream, and its tributaries as the cost of managing the disposal of various wastes. The cost has fallen disproportionately on the local Māori communities that relied on the catchment for not only their economic, but socio-cultural survival. The pollution and destruction of the lake can largely be attributed to the failure of succeeding Councils unwilling to restore the lake and stream, and legislation such as the Land Drainage Act 1906, Reserves and Other Lands Disposal Act 1956, Water and Soil Conservation Act 1967, and the Resource Management Act 1991 to protect the water and communities of species in the catchment through their enactment.

It can also be partly attributed to the total lack of representation of Ngāti Pareraukawa in the authorities empowered by the Crown to manage the catchment, ensuring that the mana whenua interests of Ngāti Pareraukawa were unable to influence decision-making.

In conclusion, this case study has shown that:

> 'Ngāti Pareraukawa have been located on the southern bank of the Hōkio Stream since the mid-1800s. Lake Horowhenua and the Hōkio Stream provided a source of water and associated resources for a century before the Levin Borough Council discharged the town's sewerage into the lake from 1953. The Levin Borough Council also established a local landfill, then a regional landfill on the south side of the marae. Lake Horowhenua and the Hōkio Stream are amongst the most polluted in New Zealand. The subsequent local and regional council have been responsible for the decline in water quality of two significant inland waterways over three generations resulting in Ngāti Pareraukawa families abandoning the marae site as a permanent occupation in the 1950s following sewerage discharge into the Lake.'[1146]

[1146] Personal communication, Rachael Selby, written comments provided during the Draft Report feedback stage, 23 July 2017.

5.5 Concluding Remarks

The effects of poor resource management of water has proven to be a complex undertaking that resulted in serious degradation of inland waterways ecosystems. When looking at resource management of land, the focus is typically limited to land use and property rights associated with it. Studying the relationship between water and people is very different; clean water is a dynamic, renewable – though not infinite, resource. In any given distinct geographical space, the form water takes, its volume, its character, its purpose, can be in a constant change of flux over time. This means that we cannot only be concerned with the use or treatment of water itself, but also have to address the effects of Crown resource management on the larger geomorphological, hydrological, ecological, economic and socio-cultural processes which determine where water is on the landscape, how much of it there is, how quickly it flows, the quality of it, across different points in time.

The effects of poor management of water are also complex to analyse in that their spatial and temporal distribution may extend greatly beyond the time and place that the initial impact occurred. This is evidenced through the number of issues around freshwater quality and availability that are being experienced today by claimants, which can be attributed to political and resource management decisions made over the past 150 years, and often outside hapū or even iwi boundaries. The effects of deforestation in the mid-1800s in the upper Manawatū catchment, has some relation to the toxicity of shellfish that the people Kāpiti Coast region are aggrieved about today. It is extremely challenging to capture all these drivers of degradation and how they relate to one another over a large, once ecologically diverse, area. Crown resource management of water doesn't consist of a few discrete incidences of impact, but rather can be described as a regime of removing the natural cleansing systems from the waterscape in favour of certain industries that were highly polluting to inland waterways, followed by a systemic failure to manage their pervasive, cumulative, and ultimately devastating effects, which have been continuously denied.

PART TWO: IMPACTS

6. WATER QUALITY

6.1 Introduction

The waterways of the inquiry district were, and remain, extremely important to local hapū and iwi: 'water is kai, water is rongoā'.[1147] Fish, aquatic birds, and aquatic plants were a crucial part of food supply. Other aquatic plants were used for rongoā (medicinal purposes) and or for weaving. Settlement patterns were intimately associated with rivers, lakes and wetlands and the quality of these freshwater resources was vital to almost every part of Māori life. The importance of the traditional harvest of resources associated with freshwaters and the role that any harvest played in establishing authority over a stretch of waterway, lake or wetland is treated as a given. For Māori, inland waterways were more than just physical resources they were the physical embodiment of ātua.[1148]

This chapter outlines the state and trends of fresh waters in New Zealand, nationally and specifically within the inquiry district.[1149] The data presented here clearly shows there have been significant declines in freshwater biodiversity, habitat and water quality and plainly reveals a systemic failure by the Crown to protect the freshwaters of New Zealand. These failings are starkly revealed by declines in biodiversity and ecosystem health. Water chemistry measures reveal that at pasture and urban catchments nitrogen levels exceed the point at which nuisance algal growth occurs at most of the sites in lowland pasture catchments. There are many symptoms and indicators but one of the most telling is the fact that New Zealand has what is likely to be the highest proportion of 'threatened' and 'at risk' freshwater fish in the developed world. The fish are in effect the miner's canaries as they integrate all the processes occurring in waterways.[1150]

The environmental degradation in the inquiry district has mirrored that seen nationally but the loss of wetlands (Chapter 7) has had multiple impacts. The loss is seen first through

[1147] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.
[1148] H Smith, *Porirua ki Manawatū Inland Waterways Cultural Perspectives Report* (Wellington: Crown Forestry Rental Trust, forthcoming).
[1149] There are two regional council regions within the inquiry district, thus state of the environment data was different and separate reporting and sampling times and reports were used to describe freshwater states and trends in this report.
[1150] MK Joy, *Polluted Inheritance: New Zealand's Freshwater Crisis* (Wellington: Bridget Williams Books, 2015).

the direct loss of fisheries and bird habitat and secondly the loss of the 'kidneys' of the freshwater systems. Wetlands are likened to kidneys because of their ecological functions taking up nutrients, cleaning water and dissipating flood flows. This loss of protection from these ecosystems and allowing the addition of more nutrients through intensification of farming and allowing industrial discharges to water is where the failure of the Crown to protect these values is most obvious. This has occurred through a litany of failures; including a failure to measure the important and meaningful symptoms of decline and a failure to implement or enforce any meaningful limits to halt declines. Details of these regulatory failings, right through to the current legislation, are given in the final sections of this chapter.

There are a number of overlaps between fisheries, wetlands and water quality and so arbitrary decisions were made on which chapter to put some aspects in. For example, biodiversity includes fish and fisheries, but are also an excellent measure of water and habitat qualities and thus are covered in this chapter.

6.1.1 A Note on the Limitations of the Term 'Water-quality'

The term 'water quality' as used by Crown agencies in New Zealand suggests a comprehensive measurement of freshwater condition that most people assume would encompass aspects of habitat and freshwater health and integrity. The reality, however, is that it is a managerial rather than an ecological assessment or ecosystem health appraisal. The parameters used to assess water quality are more closely related to ease of sampling than any genuine representation of waterway condition or health. For example, a concrete channel could have perfect water quality under this assessment but be uninhabitable for biology because there is no suitable habitat. 'Water quality' assessment is prescribed by the Ministry for the Environment as consisting of a suite of five physicochemical measures and suggests some minimal biological assessment. The physicochemical factors are suspended sediment, nitrogen, phosphorus, temperature, and dissolved oxygen, and the biological assessment is faecal coliforms and, occasionally, macro-invertebrate metrics and visual assessment of periphyton.[1151] Problematically, this 'water quality' assessment does not examine function or habitat quality, mauri or any cultural assessment, and generally not biodiversity. The problems associated with those matters

[1151] D Ballantine and RJ Davies-Colley, 'Water Quality Trends in New Zealand Rivers: 1989-2009', in *Environmental Monitoring and Assessment* 186, 2014, pp 1939-1950.

are in turn exacerbated by the fact that this limited set of measures are collected as one-off 'snap-shot' samples, despite it being known that the parameters become progressively more variable as impacts accumulate in freshwater systems. A good example is the diurnal oxygen variability outlined later in this chapter. In addition to that, most of the other measures of water quality vary seasonally, diurnally, and longitudinally, again with implications for the data sets produced from one-off 'snap-shot' samples.

Crucially, the impacts on freshwater biology are often not directly related to the parameters that are measured. The biological effects are often secondary – for example when nutrients in rivers increase, fish at first are not affected directly (although at very high levels these nutrients are toxic). Over time, however, the ensuing increase in algal growth can lead to extreme fluctuations in oxygen availability. These extremes (both low and high) are potentially lethal for all stream life, or at least harmful, but because guidelines and measurements are based on 'snap-shot' sampling, this diurnal variability is overlooked, and thus the detrimental consequences are generally not apparent to resource managers.

The other 'water-quality' parameters – nutrient levels, pH, suspended sediment, and temperature – also vary in degraded systems. However, unlike oxygen, the changes are not always diurnal but also in relation to flow and biological instream processes. For example, the bulk of the phosphorus entering flowing systems happen during flood events and both phosphorous and nitrogen levels can vary as these nutrients are taken up and released by instream plant life. Assessing such variability using one-off snap-shot sampling is not scientifically robust, and masks problems including the ones outlined above.

Other key indicators of ecological decline are not measured at a national scale, including physical alteration of habitat by deposited sediment. As outlined later in this report (6.3), sediment is an important habitat component as it in-fills interstitial spaces in the substrate that are known to be vital to fish and invertebrate life.[1152] Also not mentioned or

[1152] AJ McEwan and MK Joy, 'Habitat Use of Redfin Bullies (Gobiomorphus huttoni) in a Small Upland Stream in Manawatū, New Zealand', in *Environmental Biology of Fishes* 97(2), 2014, pp 121-132.; AJ McEwan and MK Joy, 'Responses of Three PIT-tagged Native Fish Species to Floods in a Small, Upland Stream in New Zealand', in *New Zealand Journal of Marine and Freshwater Research* 47, 2013, p 225-234; AJ McEwan and MK Joy, 'Diel Habitat Use of Two Sympatric Galaxiid Fishes (Galaxias brevipinnis and G-postvectis) at Two Spatial Scales in a Small Upland Stream in Manawatū, New Zealand', in *Environmental Biology of Fishes* 97, 2014, p 897-907.

measured is the physical instream engineering of rivers for flood control using heavy machinery and the associated confining of rivers within stop-banks, there is the loss of habitat to migrating fish and the blockage of up and downstream passage to complete life-cycles caused by dams for hydro-electricity and irrigation.

Notably missing from the assessment of water quality by government central or local is any attempt to include mātauranga Māori and or any cultural monitoring assessment.

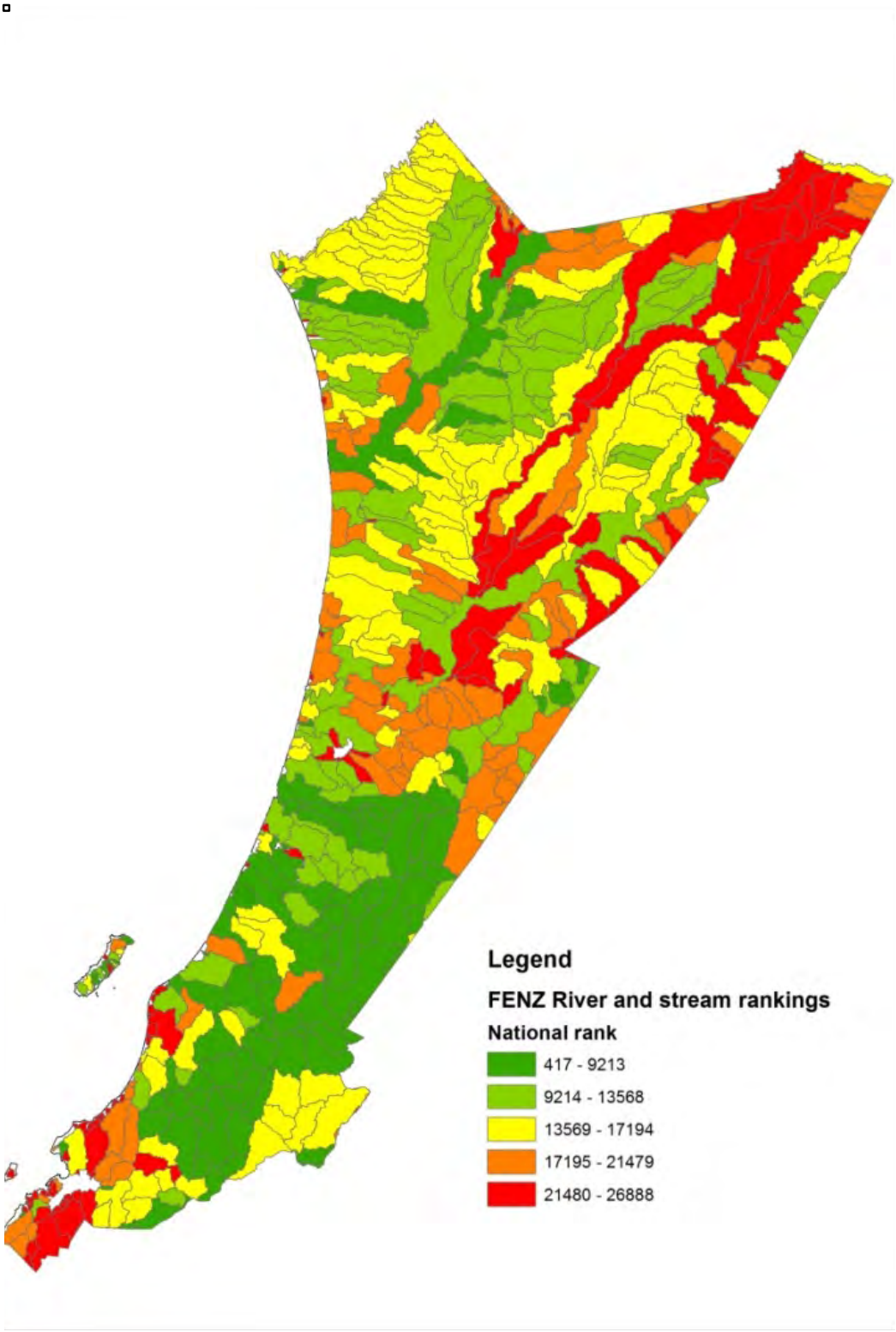
> 'This would naturally suggest that 180 years into the assumed Crown governance of our waterways, the Crown has failed to consider or include a role for mātauranga Māori in decision-making. This also exposes the disconnect between water quality measures from a Māori perspective and a scientific perspective. Water quality from a Māori perspective would naturally include measures that relate to wairua, whānau, tinana, and hinengaro (Mason Durie's Te Whare Tapa Whā model for wellbeing). Māori models of wellness exist and the failure is on the Crown and its agencies for not investing in this area over the past 180 years.'[1153]

Given all the limitations described above summed up as measuring the wrong things the wrong way, the data available on water-quality are very limited in their usefulness when describing the health of waterways. On the other hand the data that is useful and meaningful is the biological measurement because they do incorporate the variability of those other measures.

6.1.2 Overall Catchment Quality in the Inquiry District

The comparison of catchments in the inquiry district with national rankings shows that the inquiry district contains among the worst and the best catchments nationally. The graphic below shows much of the Porirua, Pohangina, and Oroua Catchments are among the worst in New Zealand, while the Ōtaki and Waikanae are in the best fifth of all catchments (Map 57).

[1153] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.



Map 57: **National water quality rankings for catchments in the Inquiry District (red worst, green best) from the Freshwater Environments of New Zealand (FENZ).**[1154]

[1154] Leathwick, J., D. West, W. L. Chadderton, P. Gerbeaux, D. Kelly, H. Robertson, and D. Brown. 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE. . Department of Conservation, Research & Development Division, Hamilton

‘Although the Ōtaki and Waikanae Rivers feature in the top 20 per cent of rivers in New Zealand in the above map, the map does not represent the highly modified state of these rivers. The analogy in the previous section determines that water in a concrete water-race could potentially have perfect water quality. While the water quality is considered to be good in the Ōtaki and Waikanae Rivers using scientific measures, the habitat in the lower reaches, where they are ‘managed’ by flood protection is poor. The obsession of Crown agencies to control rivers and adhere to a centralised river alignment means that the habitat quality is limited, with evidence that provision for Māori values in not provided for in the management of the rivers. Just because Councils have stated the water quality in the Ōtaki and Waikanae Rivers is good, does not mean that the local hapū agree with those statements. With regard to the Ōtaki River, Ngāti Raukawa would state that the position of the Council is incorrect. Assessing water quality is more holistic than those expressed within the science fraternity.’[1155]

6.2 Water Quality Impacts One: Nutrients

Many impacts on rivers, lakes, estuaries, and even oceans are caused by eutrophication. This is the result of excess nutrients, mainly nitrogen and phosphorus, from terrestrial sources. By volume, agriculture is the biggest nutrient contributor nationally,[1156] and in the Manawatū Region.[1157] The impacts of excess nutrients are not the nutrients themselves, but rather the secondary effects; that is, growing excess algae and aquatic plants (macrophytes). These plants then alter habitats in many ways to make them unliveable for the biota – fish and invertebrates.

[1155] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

[1156] McDowell, R. W., S. T. Larned, and D. J. Houlbrooke. 2009. Nitrogen and phosphorus in New Zealand streams and rivers: control and impact of eutrophication and the influence of land management. New Zealand Journal of Marine and Freshwater Research 43:985-995.

[1157] D Ballantine and RJ Davies-Colley. 2009. Water Quality State and Trends in the Horizons Region NIWA, Hamilton.

Excess nitrogen leaking from agricultural systems is not just a New Zealand issue; it is a part global environmental predicament that has been described as the 'nitrogen bomb'.[1158] For millennia, nitrogen for plant growth was fixed from the atmosphere by plants and microbes. In New Zealand clover was sewn with pasture grasses to fix nitrogen in soils for agriculture. Since the development of nitrogen fertiliser from fossil fuels in the early twentieth century, humans have changed the natural cycle immensely.[1159] Humans currently produce more nitrogen artificially than all natural processes combined, and globally our use of human-created nitrogen is three times the sustainable level. However, only a small amount of this nitrogen makes its way into the food we produce. Instead, most end up in rivers, lakes, and estuaries causing the many issues outlined in this chapter. But it doesn't end in waterways. Excess nutrients eventually make their way, over time, into oceans and create 'dead zones' off-shore.[1160] These dead zones are areas of ocean where the effects of excess nutrients from activities on the land deplete oxygen to the extent that they are uninhabitable for most life. In New Zealand approximately one-third of nitrogen fertiliser used comes from the Taranaki gas fields, produced at a factory at Kapuni in Taranaki, and the remainder comes from the Middle East.

Intensive (industrial) farming, which is how much dairy farming in New Zealand could be described, makes heavy use of external feed and fertiliser. These inputs result in nutrients leaking from farms at a rate far beyond that of any natural system. This leakage does not – at least initially – cause direct toxic harm as do many other pollutants, rather its impacts are secondary. It is not the nutrients (mainly nitrogen and phosphate) *per se* that are problematic; more accurately, it is the way they inevitably alter ecosystem processes. Rivers respond to nutrients depending on other conditions such as light and temperature, and when all these – light, temperature, and nutrients – are suitable (usually this happens in late summer), algae respond immediately with profuse growth. This shows up as mats of slimy, filamentous growth often smothering entire river beds. In slower-moving

[1158] Recently a group of twenty-eight scientists identified a set of planetary boundaries. These are the boundaries within which humanity can continue to develop and thrive for generations to come. Crossing these boundaries could generate abrupt or irreversible environmental changes. Two notable boundaries already crossed are the biogeochemical flows of nitrogen and phosphorus. The boundary for nitrogen is 22 Terragrams (1Tg = 1 million tonnes) and we are currently 7 times higher than that at 152 Tg for nitrogen. For phosphorus the boundary is 11Tg and we are double that at 22Tg. http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries.html.

[1159] Leigh, G. J. 2004. The World's greatest fix; A history of nitrogen in agriculture. Oxford University Press, New York.

[1160] http://www.scientificamerican.com/article/fertilizer-runoff-overwhelms-streams/

reaches of large rivers and lakes the algae is suspended and looks soupy, green, and can smell musty.

Excess algal and weed growth is aesthetically unattractive but it affects river ecology in many other ways. Like all plants, algae photosynthesise. They take up oxygen at night as they respire, and then discharge it during the day as they photosynthesise, which means that excess nutrients can and do secondarily cause oxygen levels in waterways to go through extreme daily swings. In a nutrient-loaded waterway, oxygen levels typically peak in late afternoon and bottom out in the early morning. A healthy stream, by contrast, has almost constant oxygen saturation levels. The more waterways become enriched with nutrients, and algae and plants bloom, the more wildly the oxygen levels swing. These fluctuations are harmful. If left unchecked, they will eventually make it impossible for fish and insects to live, except for a few hardy species which can gulp oxygen off the surface. In addition, the bed substrate is smothered by algal mats, restricting food and habitat availability for stream life.

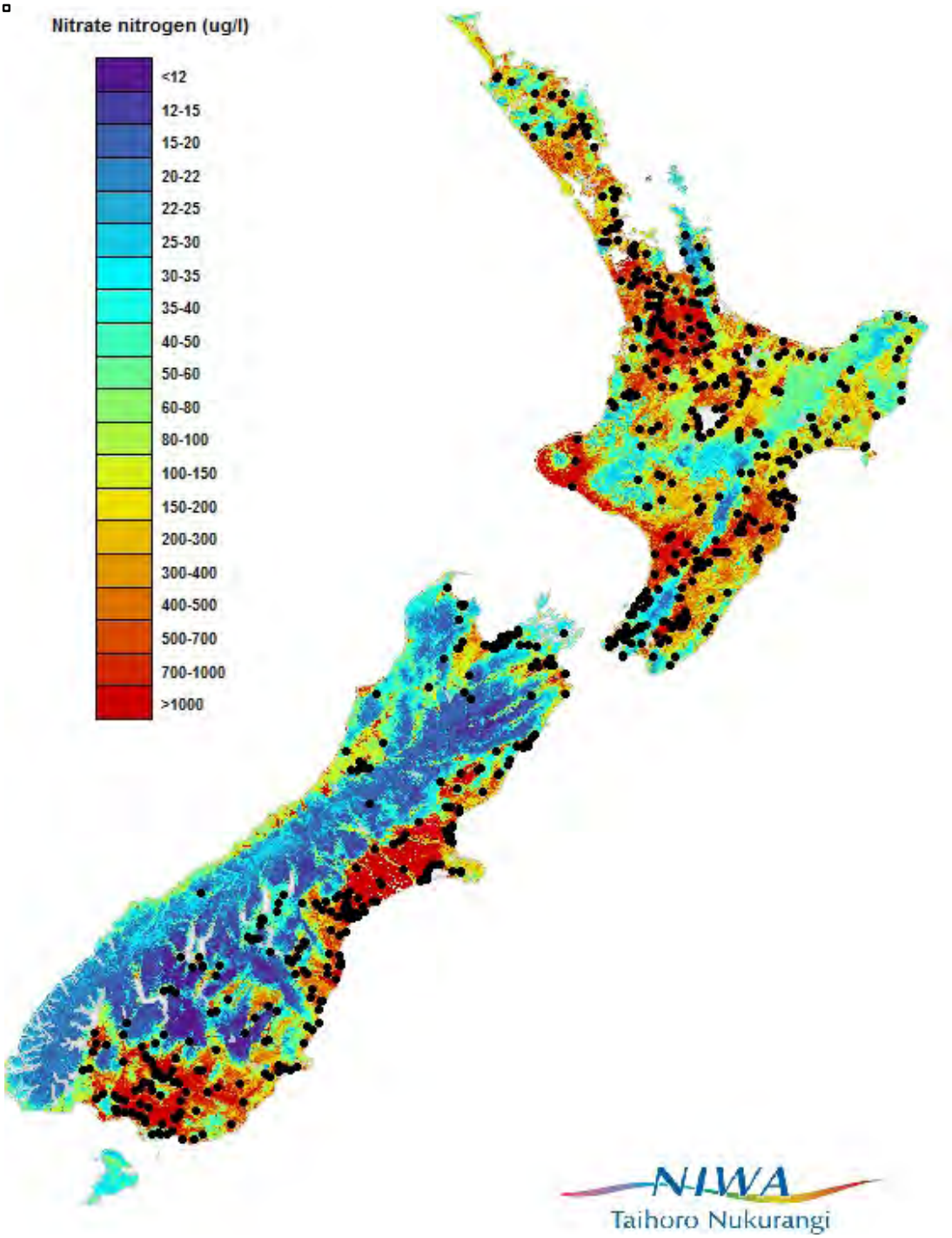
6.2.1 Nutrient Levels Nationally

The poor and deteriorating state of water quality in New Zealand is undeniable. Nationally, nutrient, pathogen, and sediment impacts are worsening, particularly in intensively farmed and urban areas. Water-quality maps produced by NIWA vividly tell the story.[1161] These maps represent rivers by coloured lines, with each colour denoting the volume of various pollutants predicted from the many hundreds of samples collected by NIWA and regional councils. These predictions fill in the gaps between the sample sites, and have been proved by validation to be very accurate at representing reality. The maps clearly show that nitrogen levels exceed the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC) in almost all lowland dairy farming catchments.[1162] The ANZECC guideline levels set a threshold based on many studies of the amount of nitrogen in water beyond which nuisance algal growth will likely occur. [1163] The maps show clearly the regions exceeding the thresholds: Southland, Canterbury, Wairarapa, Manawatū, Hawke's Bay, Taranaki, and Waikato (Map 58).

[1161] Unwin, M. J., and S. T. Larned. 2013b. Statistical Models, Indicators and Trend Analyses for Reporting National-scale River Water Quality) (NEMAR Phase 3). NIWA, Wellington

[1162] http://www.mfe.govt.nz0/publications/fresh-water/anzecc-2000-guidelines.

[1163] ANZECC. 2000. Australian and New Zealand guidelines for fresh and marine water quality: Volume 1 - The guidelines.

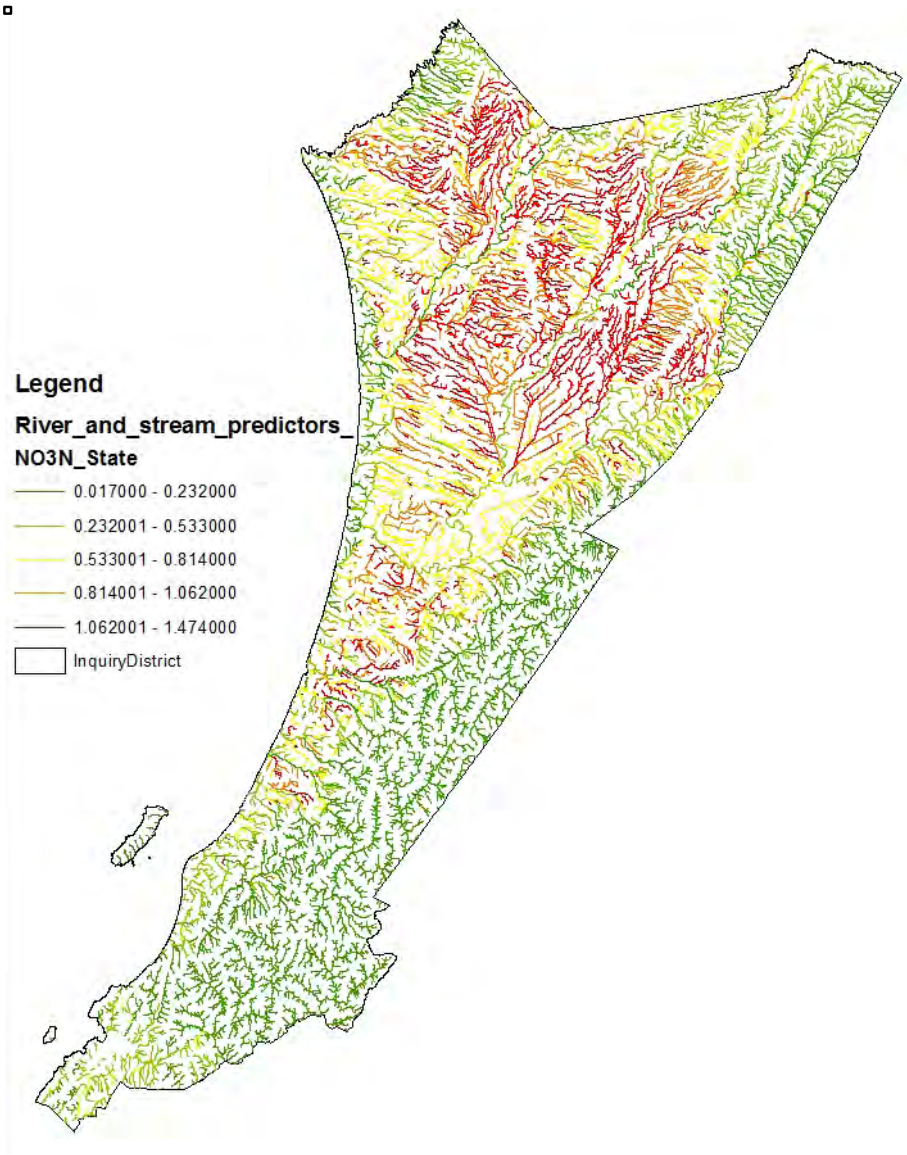


Map 58: **Figure 2. Map of predicted nitrate nitrogen. All dark orange and red areas (>410µg/l) exceed the ANZECC guideline limits for excess algal growth.**[1164]

[1164] Unwin, M. J., and S. T. Larned. 2013. Statistical models, indicators and trend analyses for reporting national-scale river water quality. NIWA.)

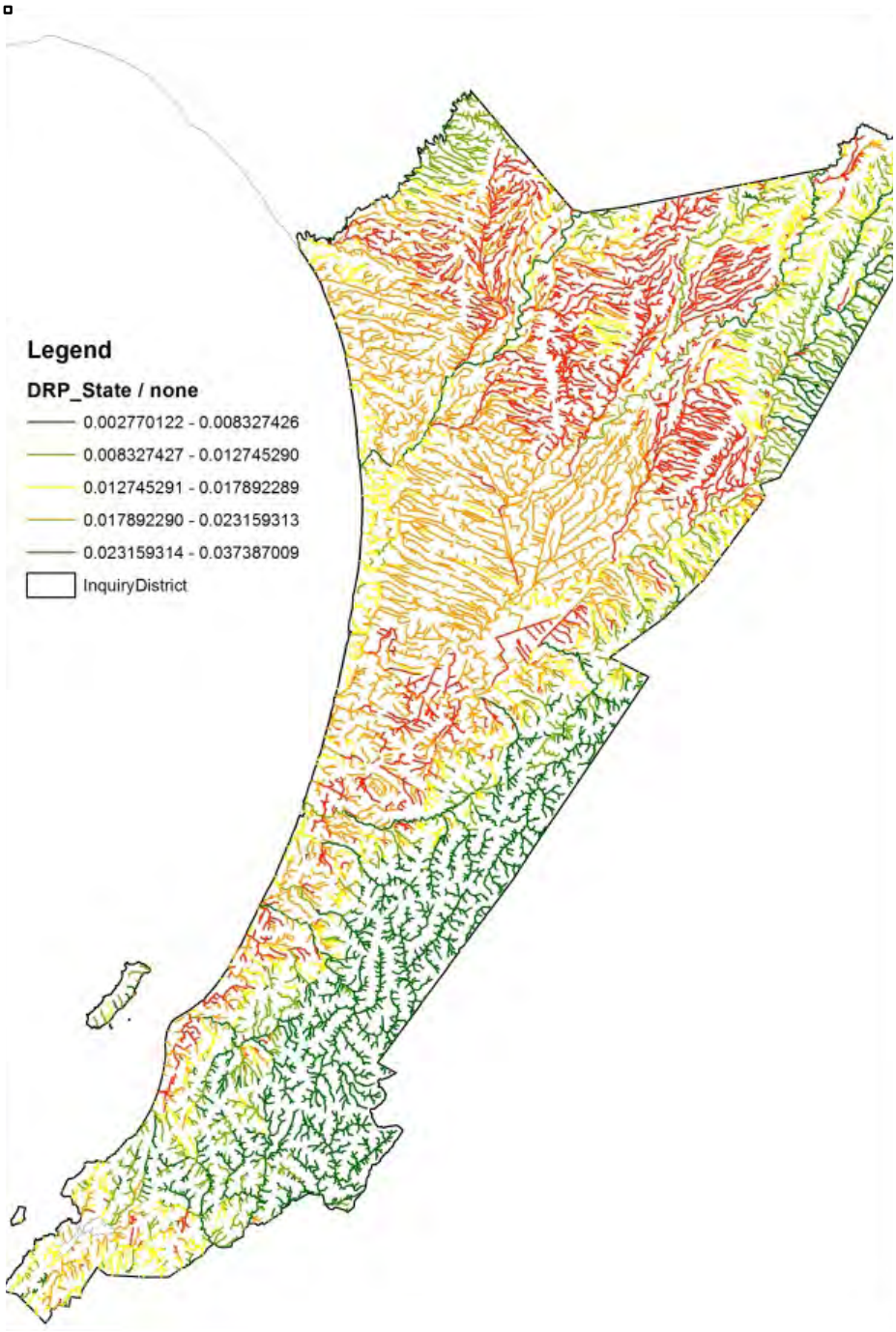
6.2.2 Nutrient Levels in the Inquiry District

Nitrogen levels in waterways in the inquiry district are highest in the waterways flowing through farmland. The lower Manawatū River and tributaries are clearly impacted by excess nitrogen (Map 58 and 59) and phosphorus (Map 60). Nutrient levels in all of the lower Manawatū and tributary sites are in the worst 50 per cent or 25 per cent of similar sites nationally for nitrogen and phosphorus in all the measured forms (Table 3).



Map 59: **Predicted log nitrogen levels (mg/l) in rivers in the inquiry district from the Freshwater Environments of New Zealand (FENZ).[1165] The green river lines show natural levels of nitrogen and the hotter colours indicate increasing levels. The orange and red indicate levels that exceed guideline levels to protect against excess periphyton (slime) growth.**

[1165] Leathwick, J., D. West, W. L. Chadderton, P. Gerbeaux, D. Kelly, H. Robertson, and D. Brown. 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE. Department of Conservation, Research & Development Division, Hamilton.



Map 60: **Predictive map of dissolved reactive phosphorus (DRP) concentrations for rivers in the inquiry district.**[1166]

[1166] J Clapcott, EO Goodwin, T Snelder, K Collier, and M Neale (forthcoming), 'A Comparison of Model Approaches for Predicting Benchmarks for Macroinvertebrate Community Metrics', in *New Zealand Journal of Marine and Freshwater Research*, 2017.

Table 3: **Median values for total nitrogen, total oxidised nitrogen, ammonia, dissolved reactive phosphorus, and total phosphorus (in that order) with their quartile ranking and comparison with similar sites nationally for the regional council state of the environment sites in inquiry district. Ranking: 1 = in best 25 per cent; 2 = best 50 per cent, 3 = worst 50 per cent and 4 = worst 25 per cent of similar rivers nationally (Land and Water Aotearoa (LAWA) http://www.lawa.org.nz/)**

Site	Median	Quartile	Median	Quartile	Median	Quartile	Median	Quartile	Median	Quartile
Manawatru Whirikino	0.885	3	0.460	3	0.040	4	0.170	3	0.062	4
Manwatu Shannon	0.880	3	0.521	3	0.070	4	0.160	3	0.060	4
Manawatu at Opiki	0.815	3	0.435	3	0.066	4	0.145	3	0.046	3
Manawatu at longburn	0.760	3	0.440	3	0.890	4	0.016	3	0.042	3
Manawatu at Teachers College	0.660	3	0.435	3	0.005	1	0.012	3	0.028	3
Tokomaru at Horseshoe	0.170	1	0.050	1	0.005	1	0.007	2	0.013	2
Mangaore Stream	0.245	2	0.130	2	0.005	1	0.005	1	0.013	1
Oroua at Awahuri	1.060	4	0.530	3	0.143	4	0.015	3	0.045	4
Oroua us Feilding wtp	0.495	2	0.230	3	0.005	1	0.014	3	0.036	3
Oroua at Almadale	0.180	2	0.080	2	0.005	1	0.008	2	0.018	2
Oroua at Apiti	0.120	1	0.050	1	0.005	1	0.006	2	0.011	1
Otaki at mouth	0.055	1	0.046	1	0.005	1	0.005	1	0.006	1
Ōtaki River at Pukehinau	0.055	1	0.033	1	0.005	1	0.004	1	0.006	1
Waitohu Stream at Norfolk	0.620	3	0.345	3	0.024	4	0.017	3	0.039	3
Waitohu Stream at Forest Park	0.055	1	0.026	1	0.005	1	0.008	1	0.013	1
Mangapouri Stream at Bennetts Rd	2.450	4	1.730	4	0.046	4	0.037	4	0.076	4
Ngarara Stream at Field Way	0.720	3	0.055	1	0.022	4	0.045	4	0.100	4
Waikanae River at Greenaway Road	0.320	2	0.230	2	0.005	1	0.008	1	0.010	1
Waikanae River at Mangaone Walkway	0.200	1	0.146	2	0.005	1	0.130	3	0.060	2
Whareroa Stream at Queen Elizabeth Park	0.800	3	0.280	3	0.067	4	0.045	4	0.079	4
Whareroa Stream at Waterfall Road	0.560	3	0.405	3	0.005	1	0.029	4	0.043	3

Annually, more than sixty per cent of lowland sites in the Manawatū River catchment have exceeded the ANZECC guideline nitrogen limits in the last decade; [1167] in 2006 nearly ninety per cent exceeded (Figure 36). Maps 59 and 60 show clearly that the key nutrients, nitrogen and phosphate, are highest in the lowland Manawatū sites and better in the waterways to the south, for example the Ōtaki and Waikanae Rivers, where higher proportions of the catchment are in native forest.

[1167] ANZECC. 2000. Australian and New Zealand guidelines for fresh and marine water quality: Volume 1 - The guidelines

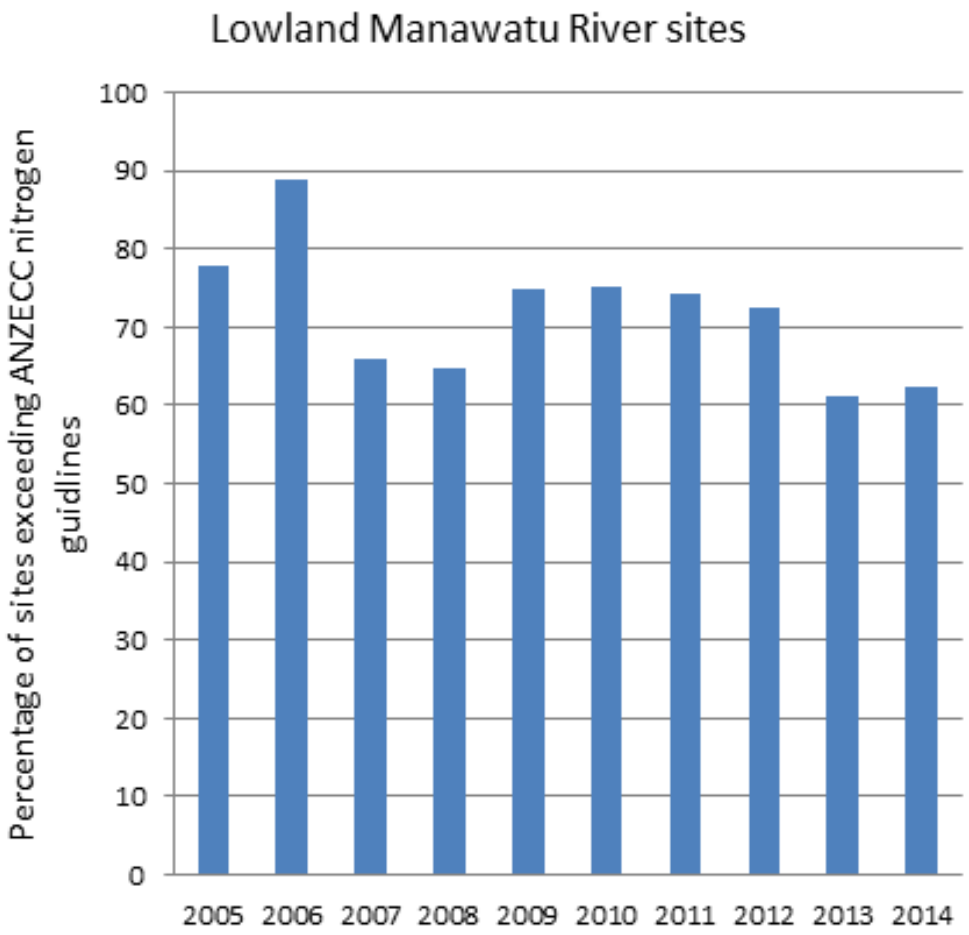


Figure 36: **Proportion of sites exceeding the ANZECC guideline limits for total nitrogen for all lowland Manawatū River sites from LAWA (Land and Water Aotearoa (LAWA) http://www.lawa.org.nz/)**

6.2.3 Impacts of Excess Nutrients – Periphyton

One of the biggest impacts resulting from too much nutrients is excess algal growth and is seen particularly in summer months. Known as periphyton, this excess growth has ecological as well aesthetic impacts on waterways (see Figure 37 for an example).

Figure 37: **An example of filamentous periphyton growth in Stoney Creek, a Tributary of the Manawatū River.**

The New Zealand periphyton guideline gives periphyton limits and their corresponding nutrient concentrations to achieve protection of different instream values. There is no national analysis of compliance with these guidelines or limits for periphyton in the National Policy Statement for Freshwater Management (NPS-FM). Some regional councils have done their own analyses. For example, in the Manawatū Region headwater river sites met their guidelines (which are similar to the guideline levels contained in the New Zealand periphyton guidelines) but 47 per cent of sites in the northern part of the region exceeded the guidelines for chlorophyll *a* for more than 10 per cent of the time (Chlorophyll *a* is a measure of periphyton biomass calculated using a laboratory procedure). [1168] It is important to note that while the reported figures are based only on sites that exceed the value more than 10 per cent of the time, in an ecological sense this is not an acceptable approach as any requirement for life (such as dissolved oxygen which is compromised by high algal biomass) that is missing even for only 1 per cent of the time

[1168] Kilroy, C., J. Wech, M. Chakraborty, L. Brown, B. Watson, M. Patterson, M. Patterson, and T. Shell. 2016. Periphyton in the Manawatū - Whanganui region; State, trends and seasonality, 2009-2015. NIWA, Christchurch.

will be lethal. Thus, zero exceedances must be the requirement for meaningful protection of ecosystem health. The 10 per cent exceedance allowance is therefore not scientifically robust and simply hides the real effects of the periphyton on oxygen levels covered in the next section.

A compelling example of how excess nutrient driven algal growth leads to lethal secondary effects is the Horizons Regional Council State of the Environment (SOE) monitoring site at Hopelands Road in the Tararua District. This site in the upper Manawatū catchment is dominated by pasture (85 per cent) and has a predicted nitrogen level of 1.2 mg/l. In summer the algal growth blooms and the oxygen saturation levels undergo extreme fluctuation (Figure 38).[1169]

[1169] Clapcott, J., and R. Young. 2009. Temporal variability in ecosystem metabolism of rivers in the Manawatū-Wanganui Region. 1672, Horizons Regional Council.

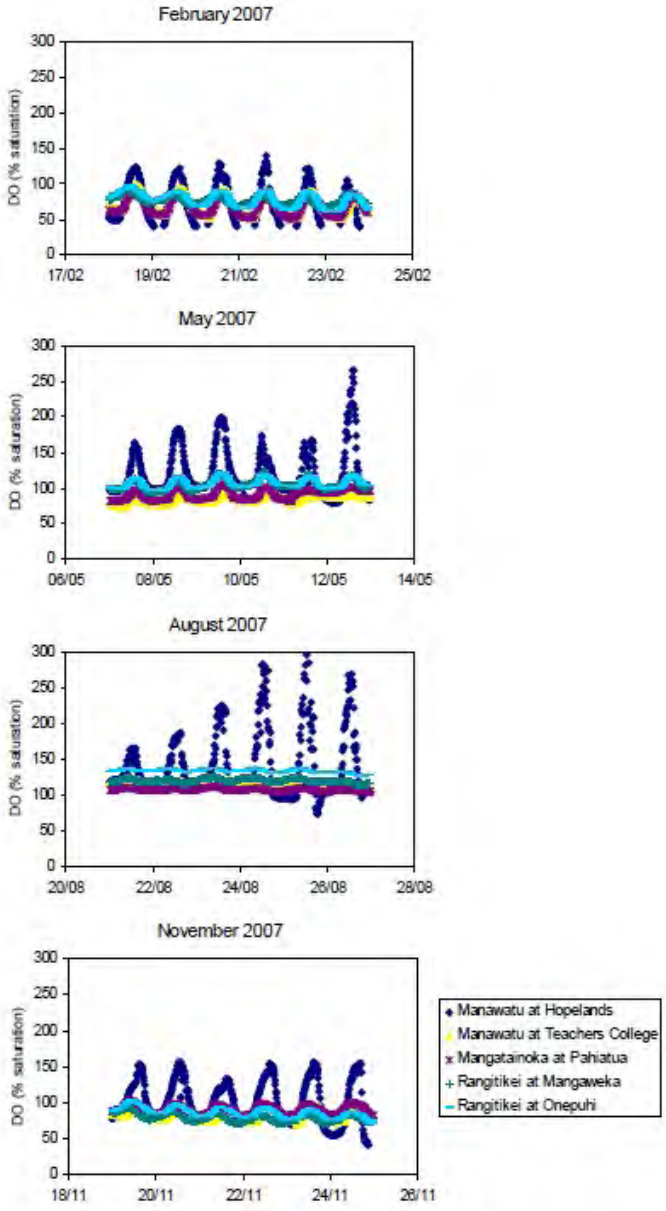


Figure 38: **Graphs of five day diurnal variation in dissolved oxygen at five sites in the Manawatū Region. Similar variability was found at the Opiki site in another study.**[1170]

This work on oxygen fluctuation was done by Dr Roger Young as part of background technical research leading up to a plan change for Horizon Regional Council's One-Plan. The monitoring of daily oxygen fluctuations using samples taken at 15 minute intervals revealed some major failings in water quality monitoring nationally. The usual situation (for all regional council SOE monitoring and National Institute for Water and Atmospheric Research ("NIWA") National River Water Quality Network ("NRWQN")

[1170] Clapcott, J., and R. Young. 2009. Temporal variability in ecosystem metabolism of rivers in the Manawatū-Wanganui Region. 1672, Horizons Regional Council.

monitoring) is that one-off samples are taken monthly during the day.[1171] That meant that this variability had not been made public before and it revealed major failings in water quality monitoring not just in the Horizons region but nationally. This failure by Horizons Regional Council was central to an academic paper on managing freshwaters.[1172]

The continuous oxygen monitoring revealed not only the inadequacy of monitoring by monthly snap-shot sampling but also the extremely poor state of the Manawatū River. The measurement of diurnal oxygen variation allows for the calculation of ecosystem respiration ("ER") and Gross Primary Productivity ("GPP") measures.[1173] The Cawthron Institute compared the GPP and ER data collected in the Manawatū River with data from 570 other sites from around New Zealand and the world and not one of these was higher than the Manawatū River at Hopelands Road; in fact this site was double the variability found at any of the other sites.[1174] Another more recent report by Horizons revealed that a lower Manawatū River site at Opiki also had similar extreme fluctuations, and also almost double that found anywhere in the list of 570 sites collated by the Cawthron Institute.[1175] Thus, the approach of monthly snap-shot monitoring had totally failed to pick up the real impact: the lethal oxygen fluctuations.[1176]

Of the monitored sites in the Manawatū River catchment, periphyton levels have been high at lowland sites. Map 61 shows that for most of the large river monitored sites, filamentous periphyton levels are either high or very high.

> 'In 1978, the Lake Horowhenua Steering Committee published a report on Lake Horowhenua,[1177] which identified that during an algal bloom the dissolved oxygen levels fluctuated from 17mg/l during the day to less than 1mg/l during the night.

[1171] State of the environment (SOE) monitoring is a requirement for regional councils to monitor a representative set of sites so they can report regularly on the state of the environment, and this data can be made available to the Ministry for the Environment to report at a national scale.

[1172] Tadaki, M., G. Brierley, and I. C. Fuller. 2014. Making rivers governable: Ecological monitoring, power and scale. New Zealand Geographer 70:7 - 21.

[1173] J Clapcott, EO Goodwin, T Snelder, K Collier, and M Neale (forthcoming), 'A Comparison of Model Approaches for Predicting Benchmarks for Macroinvertebrate Community Metrics', in *New Zealand Journal of Marine and Freshwater Research*, 2017.

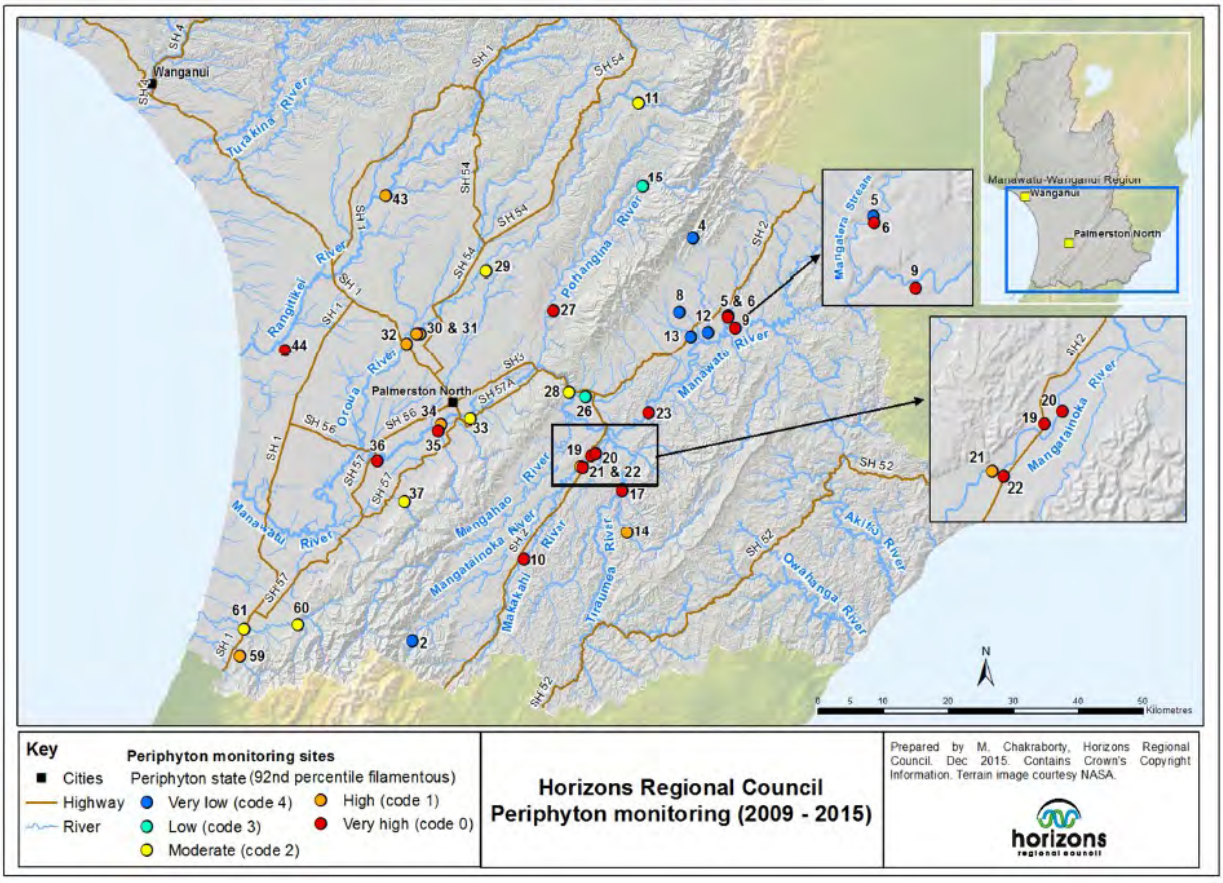
[1174] R Young, *Ecosystem Metabolism in the Manawatū River* (Nelson: Cawthron Institute, 2016).

[1175] J Clapcott, EO Goodwin, T Snelder, K Collier, and M Neale (forthcoming), 'A Comparison of Model Approaches for Predicting Benchmarks for Macroinvertebrate Community Metrics', in *New Zealand Journal of Marine and Freshwater Research*, 2017.

[1176] Tadaki, M., G. Brieley, and I. C. Fuller. 2014. Making rivers governable: Ecological monitoring, power and scale. New Zealand Geographer 70:7 - 21.

[1177] Lake Horowhenua Technical Committee, 1978, *Lake Horowhenua: Current condition, Nutrient Bedget and Future Management.*

The revelation is that 40 years after a clear understanding of the biological processes in our waterways, the council continued to monitor using a methodology which was flawed. An optimist would say it was a 40 year oversight, the pessimist would counter that it was a deliberate omission of good science to hide an inconvenient truth. The facts remain; the method for assessing water quality with reference to dissolved oxygen was fundamentally flawed, and that the Council have known for over 40 years that the method for gathering this information was flawed. It is evidence of gross negligence of our waterways.'[1178]



Map 61: **Periphyton state at Manawatū periphyton monitoring sites 2009 – 2015.** [1179]

[1178] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

[1179] Kilroy, C., J. Wech, M. Chakraborty, L. Brown, B. Watson, M. Patterson, M. Patterson, and T. Shell. 2016. Periphyton in the Manawatū - Whanganui region; State, trends and seasonality, 2009-2015. NIWA, Christchurch

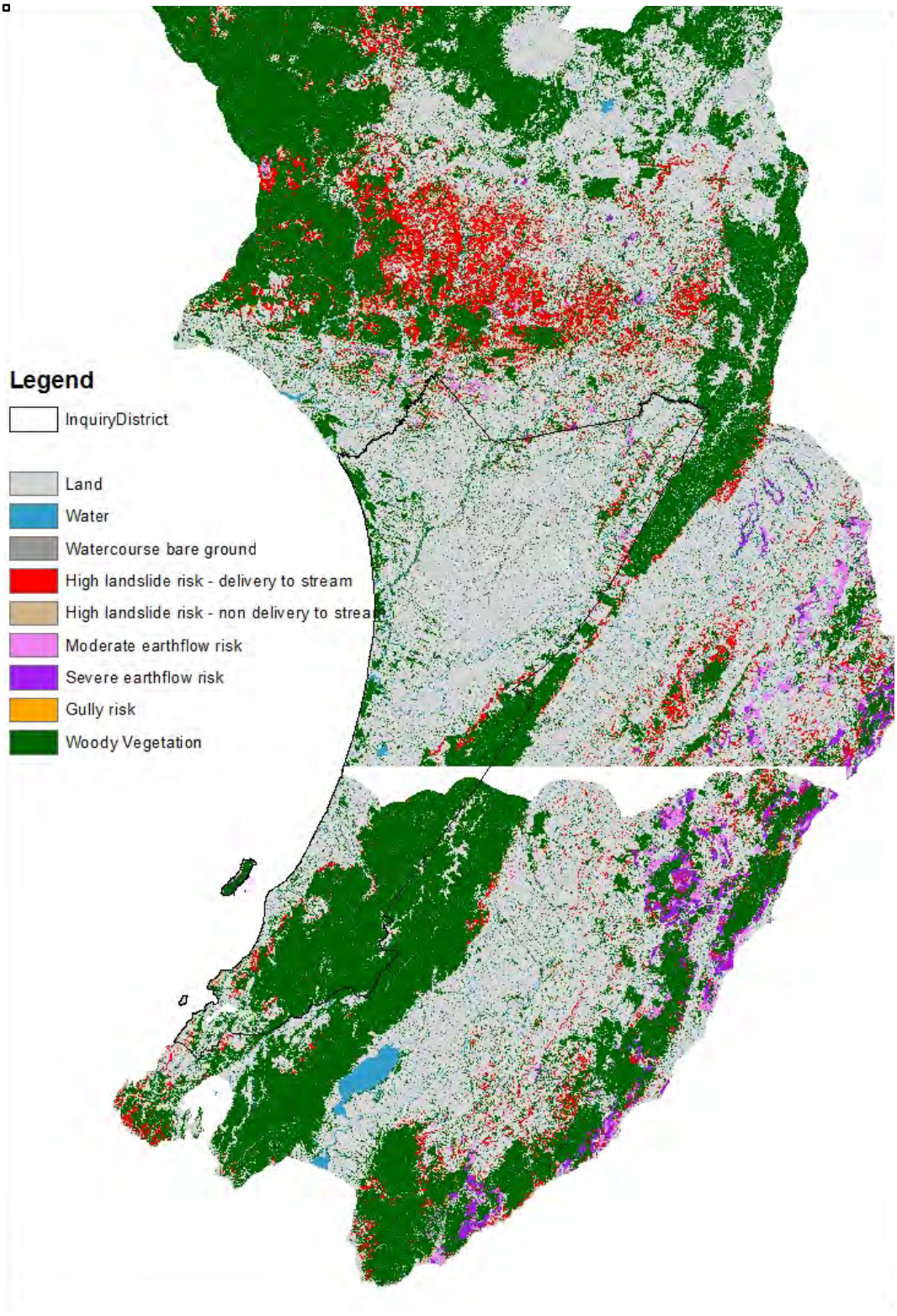
6.3 Water Quality Impacts Two: Sediment and Engineering

Accelerated sedimentation is the result of soil eroding mostly off hillsides and riverbanks that eventually end up in waterways. In a healthy forested catchment this is a normal, if very gradual, natural process. However, hillsides cleared for pasture lose soil at a much faster and uncontrolled rate. In rivers and streams with no vegetation on banks and where stock have access the banks erode and collapse into the waterways. On these cleared and usually grazed hillsides, where soil can be lost more rapidly than the waterway can carry it away, the sediment in water smothers habitats, carries phosphorus (and often faecal contaminants), and has negative impacts for freshwater ecosystems when it settles out on the bed of the waterway.

Landcare Research scientists have mapped the landslip risks for New Zealand and Map 62 shows the high landslip risk areas in the headwaters of the Pohangina and Oroua catchments.[1180] Highly erodible land is defined as land with the potential for severe erosion if it does not have protective woody vegetation; in the Manawatū, 39,000 ha is in this classification.[1181]

[1180] Dymond, J. R., A. G. Ausseil, J. D. Shepherd, and L. Buettner. 2006. Validation of a region-wide model of landslide susceptibility in the Manawatū-Wanganui region of New Zealand. Geomorphology 74:70-79.

[1181] Dymond, J. R., A. G. Ausseil, J. D. Shepherd, and L. Buettner. 2006. Validation of a region-wide model of landslide susceptibility in the Manawatū-Wanganui region of New Zealand. Geomorphology 74:70-79.



Map 62: **Landslip risk map for the lower North Island.**[1182]

[1182] Dymond, J., and J. Shepherd. 2006. Highly erodible land in the Manawatū-Wanganui region. Landcare Research NZ Ltd.

The impacts of accelerated erosion are many but include physical and biological impacts. The beds of rivers continually loaded with excess sediment can eventually rise higher than the surrounding land (the lower Manawatū River is possibly New Zealand's largest scale example of this) and stopbanks have to be built to protect towns and farms from flooding. These levees extend all the way to the sea and create another set of problems, because any tributary rivers must then have one-way flood-gates across them to stop the main river flooding back upstream onto surrounding land. As the main river rises, the flap-gates close, but water in the tributaries must still somehow be allowed to flow into the main river. To achieve this, river engineers have had to install pumps to move water from the tributaries over the stopbank. These flap-gates are also barriers to native fish migration and the pumps can suck small fish into intakes.

Excess sediment harms stream ecology in many other ways. One is in the form of suspended sediment, which we see as dirty brown water. The discoloured water reduces feeding opportunities for fish, and blocks the sunlight that healthy ecosystem processes need.[1183] Often, however, the biggest impact is not on water clarity but on the loss of habitat when sediment falls out of the water column (out of suspension) and settles on the river or stream bed (deposited). Most native New Zealand fish are benthic, which means they live and feed on the bottom of the river, as opposed to swimming in the upper current.[1184] Adult whitebait species, kōaro (G*alaxias brevipinnis*), shortjaw kōkopu (*Galaxias postvectis*), and the redfin bully (*Gobiomorphus huttoni*) are just a few examples.

These fish rely on the gaps between rocks and boulders – called interstitial spaces – in the bed of the waterway. When sediment smothers those spaces, fish suffer a major loss of habitat.[1185] Sediment drops out of the water column when flows slow and thus is deposited and fills these interstitial spaces. Following that, the only place left for the fish to live is on the bed, and if there is no instream cover there is nowhere for them to go. An analogy of this would be that where there is no deposited sediment fish can live in spaces

[1183] Richardson, J., and I. Jowett. 2002. Effects of sediment on fish communities in East Cape streams, North Island New Zealand. New Zealand Journal of Marine and Freshwater Research 36:431-442.
[1184] McDowall, R. M. 1990. New Zealand Freshwater Fishes: A Natural History and Guide. Heinemann Reed, Auckland.
[1185] McEwan, A. J., and M. K. Joy. 2014. Diel habitat use of two sympatric galaxiid fishes (Galaxias brevipinnis and G-postvectis) at two spatial scales in a small upland stream in Manawatū, New Zealand. Environmental Biology of Fishes 97:897-907.

like humans in an apartment building and when the spaces are filled then the fish can only live on the roof of the apartment.

Thus, it shows up in a badly eroded catchment as the interstitial spaces buried and then the only place these fish can hide is beneath undercut banks or debris in the stream. Many New Zealand streams are now smothered in this way, drastically reducing the number of individual fish that can occupy a given stretch of river. In a study on the use of interstitial spaces by native fish in a small Manawatū river tributary, more than four hundred fish were found resident in one hundred metres of stream without sediment impact, while a nearby similar stream with poor land management in the catchment had a deposited sediment problem and there were fewer than fifty fish over the same length.[1186] An extreme example of the impact of sediment on stream life in the inquiry district can be seen in the Beehive Stream near Pohangina Village (Figure 39).

Figure 39: **An example of extreme sedimentation in the Manawatū Catchment, Beehive Creek Pohangina.**

Rates of sedimentation are high after land clearance and roadworks. The Wainui Stream in Paekākāriki for example, pictured in time sequence in Figure 40, shows just how quickly sedimentation can happen even in small catchments. The photos show the same point from 2006 to 2013; the steps are a grade control structure and are 900mm high and three are visible in 2006, but by 2013, the structure had been buried.

[1186] McEwan, A. J., and M. K. Joy. 2014. Diel habitat use of two sympatric galaxiid fishes (Galaxias brevipinnis and G-postvectis) at two spatial scales in a small upland stream in Manawatū, New Zealand. Environmental Biology of Fishes 97:897-907.

Figure 40: **Example of recent sedimentation the Wainui Stream Paekākāriki Wellington.**

As is the case with nutrients it doesn't end in freshwaters, eventually the excess sediment in waterways ends up in lowland lakes, harbours, and estuaries, and most of these are now seriously choked. Wherever forest has been cleared for pasture, freshwater and estuarine biodiversity has suffered through the alteration of vegetation patterns and increasingly volatile oxygen levels. Estuaries are nurseries for a number of oceanic fish species, many of which are commercially harvested. For example, marine fish like snapper now have a severely reduced nursery range due to the smothering of eel-grass in shallow estuaries such as the Whanganui River.[1187]

6.3.1 Morphological Diversity and Instream Habitat

The heterogeneity of instream habitat is an important component of fish habitat and it is closely linked to the morphological diversity of a river channel.[1188] Maintaining or enhancing morphological diversity of river channels can have positive effects on the instream habitat and thereby the opportunities for enhancing aquatic biodiversity. Conversely, cumulative and ongoing reductions in morphological diversity, which occur as a consequence of river engineering, can negatively affect the availability of habitats for aquatic species.[1189]

[1187] Morrison, M. A., M. Lowe, D. Parson, N. Usmar, and I. McLeod. 2008. A review of land-based effects on coastal fisheries and supporting biodiversity in New Zealand. Report, NIWA, Auckland.

[1188] McEwan, A. J., and M. K. Joy. 2014. Diel habitat use of two sympatric galaxiid fishes (Galaxias brevipinnis and G-postvectis) at two spatial scales in a small upland stream in Manawatū, New Zealand. Environmental Biology of Fishes 97:897-907.

[1189] Hamer, M. P. 2004. Fish communities in the upper Manawatū Catchment tributaries. Horizons.

6.3.2 Fish Barriers and Flood Gates

Loss of connectivity between freshwater and marine environments is one of the major conservation issues for diadromous fishes.[1190] Enabling the upstream and downstream migration of the majority of the region's native fish species will enhance aquatic biodiversity generally by opening up habitat that previously excluded some or all species, either at critical migration times or throughout the year. Further investigation of flood and tide gate timing or the introduction of fish gates within existing structures may increase migration opportunities for many species. Further investigation and remedial work is required to reduce the adverse effects of fish barriers on aquatic biodiversity. Conversely, there is evidence to suggest a positive effect from the exclusion of salmonid fish from upstream indigenous fish habitats through the use of structures which only allow the passage of galaxiid fish but exclude trout or salmon.[1191]

6.3.3 Loss of Riparian Cover

The impact of lowland riparian deforestation can be seen with reductions in fish community diversity and abundance but it is not possible to know given the decline in water quality and increase in deposited sediment that are all correlated. Regionally, two thirds of the native fish species are nocturnal or cryptic and require habitat with suitable stream shading and high amounts of woody instream cover.[1192] One third of the fauna require specific riparian vegetation for successful bankside or forest-litter spawning (in conjunction with autumnal bank-full flows). The expectation of higher diversity and abundance of fish communities in lowland areas hinges on the availability of suitable instream and riparian habitat, which are absent throughout much of the region.[1193]

One important component of the ecological health of waterways is shading from riparian vegetation, and the removal of forest vegetation alongside waterways has had many impacts on waterways, especially the smaller ones. Shading from riparian vegetation

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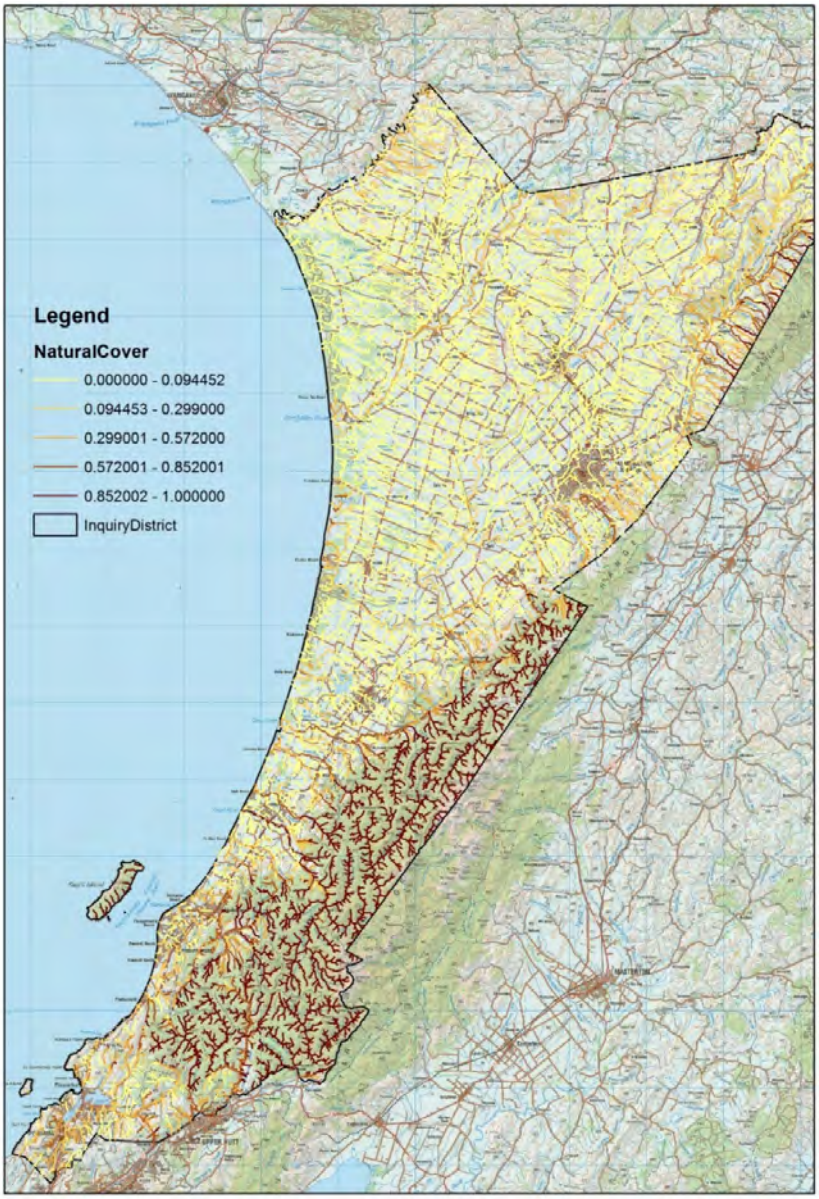
[1190] Joy, M. K., and R. G. Death. 2001. Control of freshwater fish and crayfish community structure in Taranaki, New Zealand: dams, diadromy or habitat structure? Freshwater Biology 46:417-429. McDowall, R. M. 1998. Driven by diadromy: its role in the historical and ecological biogeography of the New Zealand freshwater fish fauna. Italian Journal of Zoology 65:73-85.

[1191] McDowall, R. M. 2006. Crying wolf, crying foul, or crying shame: alien salmonids and a biodiversity crisis in the southern cool-temperate galaxioid fishes? Reviews in Fish Biology and Fisheries 16:233-422.

[1192] McDowall, R. M. 1990. New Zealand Freshwater Fishes: A Natural History and Guide. Heinemann Reed, Auckland

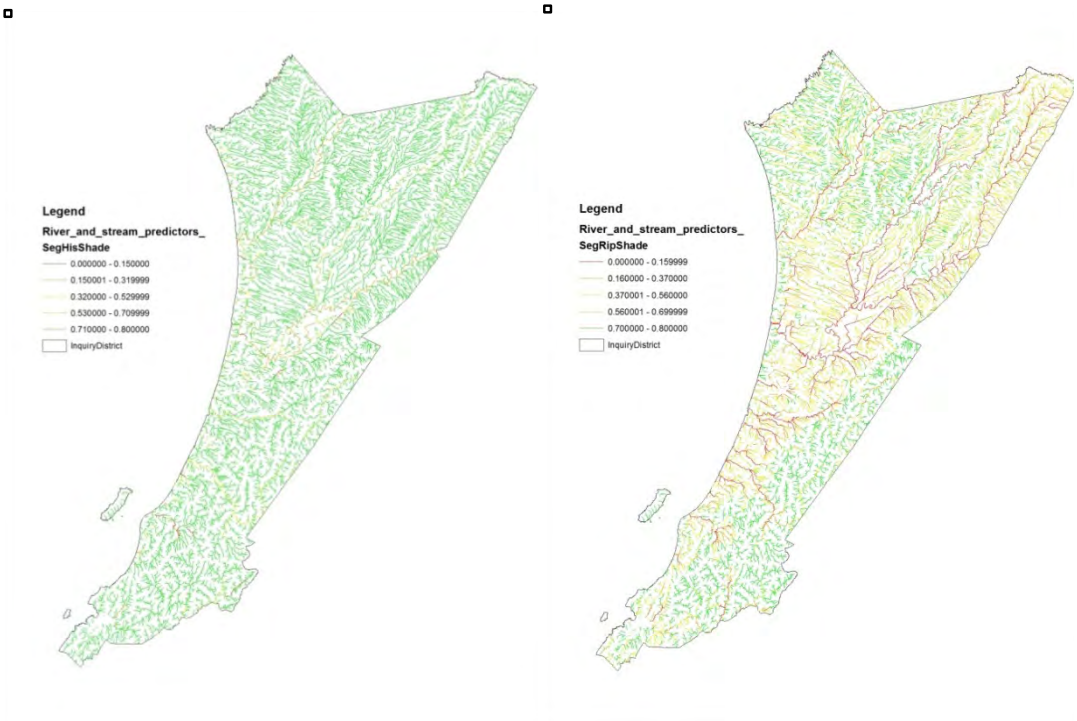
[1193] Jowett, I. G., and J. Richardson. 1996. Distribution and abundance of freshwater fish in New Zealand rivers. New Zealand Journal of Marine and Freshwater Research 30:239-255.

influences periphyton growth and water temperature and acts as a buffer limiting sediment, pathogen, and nutrient movement in water. The map of the inquiry district shows the extent of riparian cover over most of the lowland waterways (Maps 63 and 64). The graphics show that natural waterway cover has been almost completely removed from most of the lowland area of the inquiry district, and that it was almost 100 per cent cover historically.



Map 63: **Natural riparian cover at waterways in the inquiry district from the Freshwater Environments of New Zealand (FENZ) geodatabase.**[1194]

[1194] Leathwick, J., D. West, W. L. Chadderton, P. Gerbeaux, D. Kelly, H. Robertson, and D. Brown. 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE. . Department of Conservation, Research & Development Division, Hamilton



Map 64: **Historic pre land clearance riparian cover (left) and present cover (right) for the inquiry district from the Freshwater Environments of New Zealand (FENZ) geodatabase.**[1195]

6.4 Water Quality Impacts Three: Pathogens and Toxic Algae

6.4.1 Human Health, Swimming, and Boating Nationally

Faecal contamination, zoonoses such as cryptosporidium, and toxic algae known as cyanobacteria lead to different human health issues with two different but associated causes. Firstly, in the presence of nutrient overloads, unshaded light, and high temperatures, algae can bloom and some species can become toxic. The other is the pollution of water by faeces – the direct pollution by faecal pathogens from wastewater treatment plants and stock in and near waterways.

New Zealanders suffer very high rates of waterborne disease. Estimates from the Ministry of Health reveal that between 18,000 and 34,000 people are affected every year.[1196] New Zealand now has the invidious statistic of the highest per capita frequency of coliform enteritis, campylobacteriosis, cryptosporidiosis, and salmonellosis in the developed

[1195] Leathwick, J., D. West, W. L. Chadderton, P. Gerbeaux, D. Kelly, H. Robertson, and D. Brown. 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE. . Department of Conservation, Research & Development Division, Hamilton

[1196] Ball, A. 2006. Estimation of the Burden of Water-borne Disease in New Zealand: Preliminary Report. Prepared as part of a Ministry of Health contract for scientific services by ESR, Wellington.

world.[1197] These diseases cause gastrointestinal problems, and can be particularly harmful to the young and the elderly. Not all cases come from bathing, but because many instances are not reported, the Ministry of Health suspects these numbers are an underestimate.[1198]

It is now common to see signs along many riverbanks warning of cyanobacteria outbreaks and advising against swimming. The signs are warning people about benthic cyanobacteria mats: black, felt-like colonies that form on rocks in faster-flowing reaches. They can and do become toxic and can be lethal to humans. There are many instances of dogs and horses dying from drinking river water and licking these mats.[1199] It may only be a matter of time before a child dies after ingesting some. In lakes, toxic cyanobacteria are found in the water column and often on the surface.

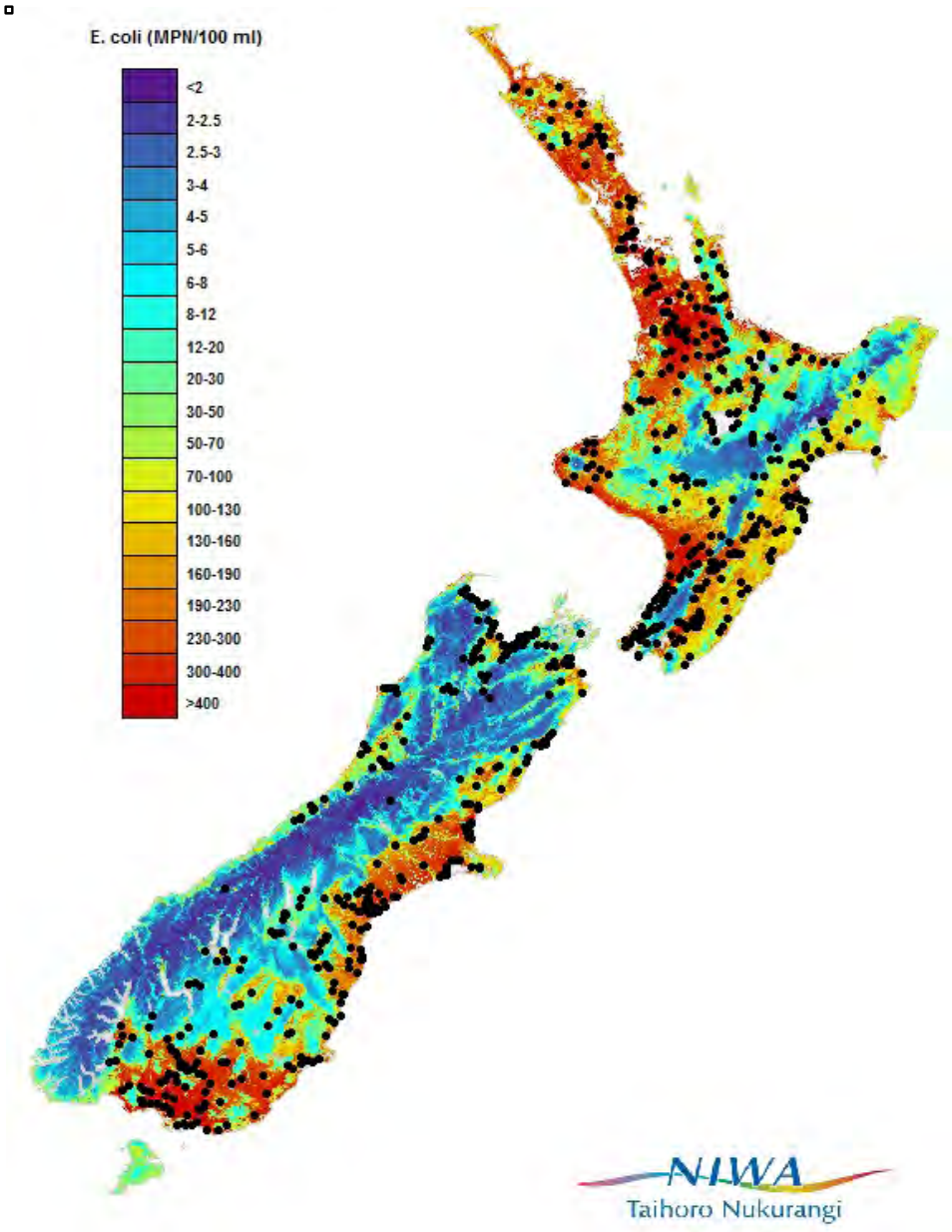
E. coli bacteria are the indicator organism generally used as an indicator of faecal contamination, and the latest modelling by NIWA shows the contact recreation standard is exceeded at 62 per cent of the length of waterways in New Zealand,[1200] measured by the length of river reaches that modelling shows would exceed the Ministry of Health and ANZECC guideline levels for contact recreation (260 MPN/l). The NIWA predictive map again shows that the worst areas for faecal contamination are in intensively farmed and lowland urban areas (Map 65).

[1197] Many separate reports on each disease but summarised by Nigel French, Massey University http://www.gpcme.co.nz/speakers/french_2014.php.

[1198] Ball, A. 2006. Estimation of the Burden of Water-borne Disease in New Zealand: Preliminary Report. Prepared as part of a Ministry of Health contract for scientific services by ESR, Wellington.

[1199] http://www.stuff.co.nz/dominion-post/news/hutt-valley/6454829/Hutt-River-algae-kills-another-dog.

[1200] NIWA. 2011. Draft Regulatory Impact Statement: Proposed Amendments to the National Policy Statement for Freshwater Management. NIWA Wellington



Map 65: **Map of predicted *E. coli*. All red areas exceed the contact recreation limit of 260 MPN/100ml[1201].**

6.4.2 Human Health, Swimming, and Boating in the Inquiry District

The pathogen *E. coli* is used as an indicator for the presence of faecal contamination and Table 4 shows the worst rivers are the lower Manawatū and tributary monitoring sites, as well as the Waitohu and Whareroa. The best sites are the upper catchment Oroua, Waikanae, and Ōtaki sites.

[1201] Unwin, M. J., and S. T. Larned. 2013. Statistical models, indicators and trend analyses for reporting national-scale river water quality. NIWA.)

Table 4: **Median values for *E. coli* pathogens and quartile ranking in comparison with similar sites nationally for the regional council state of the environment sites in the inquiry district. Ranking: 1 = in best 25 per cent; 2 = best 50 per cent, 3 = worst 50 per cent and 4 = worst 25 per cent of similar rivers nationally (Land and Water Aotearoa (LAWA) http://www.lawa.org.nz/).**

Site	E. coli	pathogens
	Median	Quartile
Manawatru Whirikino	145	3
Manwatu Shannon	251	3
Manawatu at Opiki	200	3
Manawatu at longburn	185	3
Manawatu at Teachers College	91	2
Tokomaru at Horseshoe	59	2
Mangaore Stream	76	2
Oroua at Awahuri	140	3
Oroua us Feilding wtp	180	3
Oroua at Almadale	115	2
Oroua at Apiti	16	1
Otaki at mouth	30	1
Ōtaki River at Pukehinau	4	1
Waitohu Stream at Norfolk	600	4
Waitohu Stream at Forest Park	7	1
Mangapouri Stream at Bennetts Rd	1000	4
Ngarara Stream at Field Way	180	3
Waikanae River at Greenaway Road	25	1
Waikanae River at Mangaone Walkway	11	1
Whareroa Stream at Queen Elizabeth Park	110	2
Whareroa Stream at Waterfall Road	130	3

6.4.3 Cyanobacteria

The other human health threat, the toxic algal growth, is becoming more prevalent throughout New Zealand, but limited data exists on spatial extent. Some recorded lethal effects on animals and reported human illness can be seen with the summary table in the Wellington region (Table 5). The spatial extent of cyanobacteria in the Horizons and Wellington regions can be seen in the map and graphs below (Figure 41 and Map 66).

Table 5: **Summary of animal deaths from cyanobacteria in the Wellington region.**[1202]

Summer	River	Total dog deaths/human illness
1998/99	Waikanae River	5 dog deaths near Edgewood Park
2005/06	Hutt River	5 dog deaths in Boulcott and Avalon area
2007/08	Hutt River	3 dog deaths, 2 near Belmont School and one near Silverstream
2008/09	Kiriwhakapapa Stream	1 human illness
2009/10	Waipoua River	1 dog death near Bentley Street
2010/11	Hutt River	1 dog death near Melling Bridge
2011/12	Hutt River	2 dog deaths, 1 near Heretaunga Park and 1 between Melling and Ewen bridges

Recent reports from the Greater Wellington Regional Council show high levels of cyanobacteria in the Waikanae and Ruamahanga River monitoring sites (Table 6).

Table 6: **Cyanobacteria coverage at monitoring sites in the Wellington Region.**[1203]

Site name	Site type	Date	Cyanobacteria cover (%)
Ruamahanga River at The Cliffs	RWQ	27/02/2007	37
Ruamahanga River at The Cliffs	RWQ	06/03/2007	48
Ruamahanga River at The Cliffs	RWQ	13/03/2007	57
Ruamahanga River at The Cliffs	RWQ	05/03/2013	30
Ruamahanga River at The Cliffs	RWQ	13/03/2013	69
Waikanae River at Greenaway Rd	RSoE	27/01/2012	47
Waikanae River at Jim Cooke Park	RWQ	21/01/2009	22
Waikanae River at Jim Cooke Park	RWQ	27/01/2009	24
Waikanae River at Jim Cooke Park	RWQ	03/02/2009	35
Waikanae River at Jim Cooke Park	RWQ	11/02/2009	39
Waikanae River at Jim Cooke Park	RWQ	27/01/2010	20
Waikanae River at Jim Cooke Park	RWQ	09/02/2010	24
Waikanae River at Jim Cooke Park	RWQ	23/11/2010	20
Waikanae River at Jim Cooke Park	RWQ	15/03/2011	20
Waikanae River at Jim Cooke Park	RWQ	22/02/2012	22

[1202] A Perrie, *Annual Freshwater Quality Monitoring Report for the Wellington Region 2007/08, Publication No. GW/EMI-T-08/161* (Wellington: Greater Wellington Regional Council, 2008).
[1203] Ibid.

The statistics revealed in these tables are vast underestimates of the true extent of the problem as only a tiny proportion of the waterways are monitored and in most cases only monthly assessments. The algal cover can be very temporary but very dangerous to humans and animals and to aquatic life in that short time. So the rare occasions of more than 50 per cent cover revealed in Figure 41 cannot be seen as unimportant, it may only be at high levels for one sampling occasion but still kill most aquatic life or kill dogs, horses or even humans.

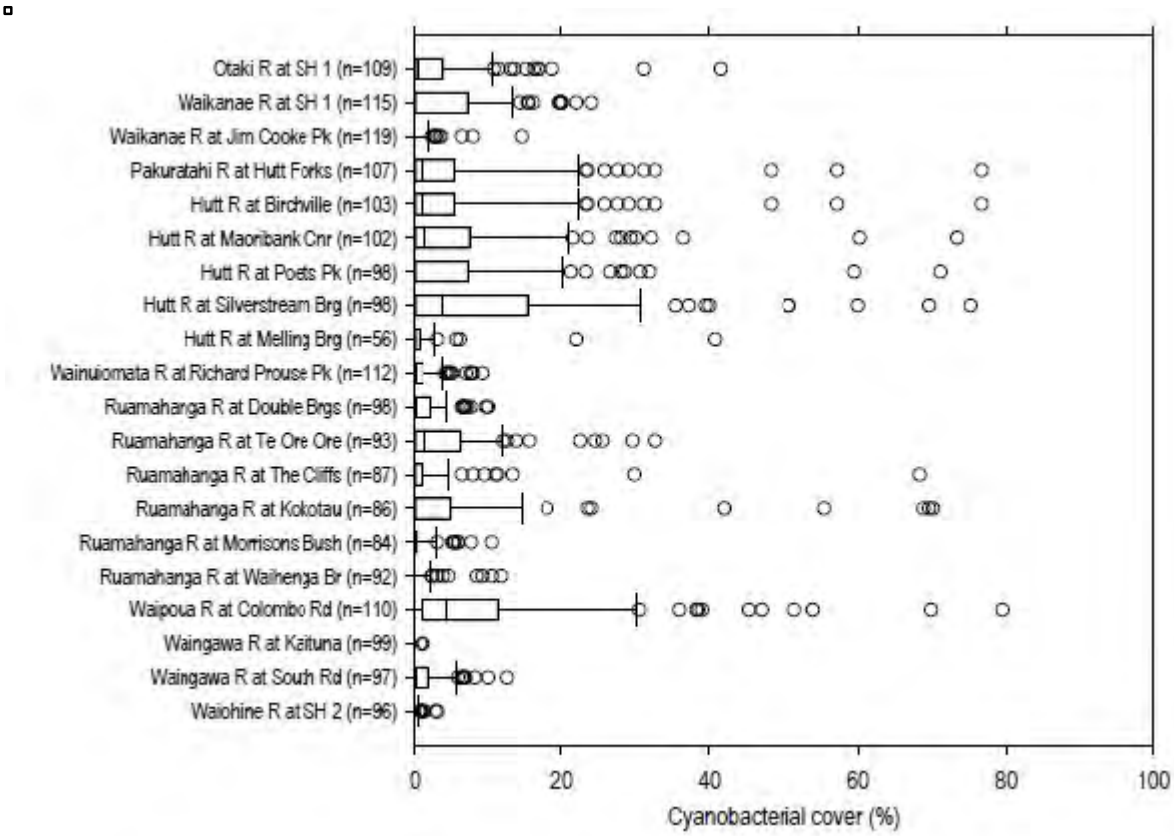
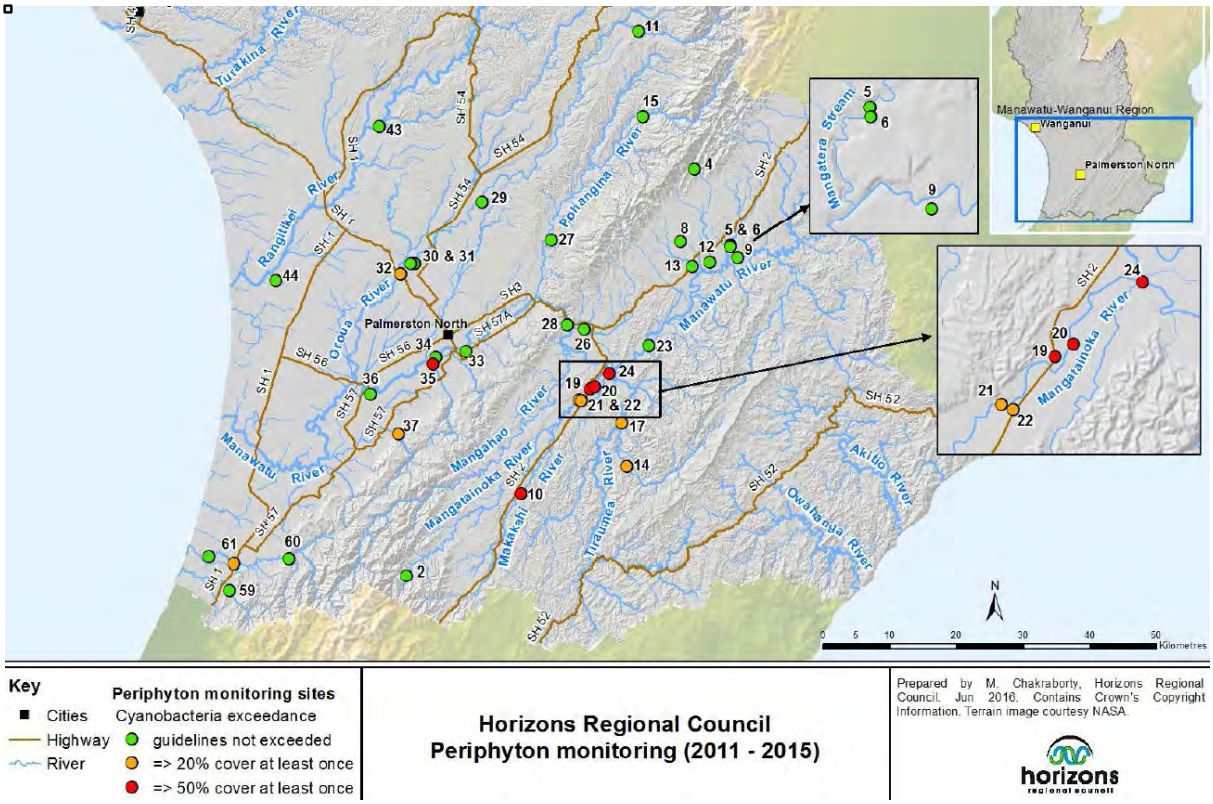


Figure 41: **Cyanobacteria coverage at monitoring sites in the Wellington region.**[1204]

[1204] Ibid.



Map 66: **Cyanobacteria monitoring summary for the Horizons Region[1205].**

6.5 Lakes

6.5.1 National State of Lakes

Some 44 per cent of more than 100 monitored lakes in New Zealand are so polluted by nutrients that they are now classed by NIWA as 'eutrophic'. This means they receive more nutrients, mainly from intensive agriculture, than they can assimilate so they have 'flipped' to another trophic state.[1206] Examples of lakes that have flipped are Te Waihora *(*Lake Ellesmere) near Christchurch, Lake Horowhenua near Levin, and Lake Waahi in the Waikato. When they flip, they go from clean and clear to murky, smelly and inhospitable to many fish and invertebrates because the natural movement of energy through the system is radically altered. Not all the lakes in New Zealand are monitored, but modelling shows that the proportion of monitored ones classed as having flipped accurately reflects the proportion of all lakes that have done so. A study of 2200 lakes

[1205] Kilroy, C., J. Wech, M. Chakraborty, L. Brown, B. Watson, M. Patterson, M. Patterson, and T. Shell. 2016. Periphyton in the Manawatū - Whanganui region; State, trends and seasonality, 2009-2015. NIWA, Christchurch

[1206] Verburg, P., K. Hamill, M. Unwin, and J. Abell. 2010. Lake Water Quality in New Zealand 2010: Status and Trends. Ministry for the Environment

worldwide showed that New Zealand has some of the least nutrient polluted lakes in the world in upland catchments in the South Island and some of the most polluted in the world in the lowland intensively farmed areas like the Waikato (Figure 42). [1207]

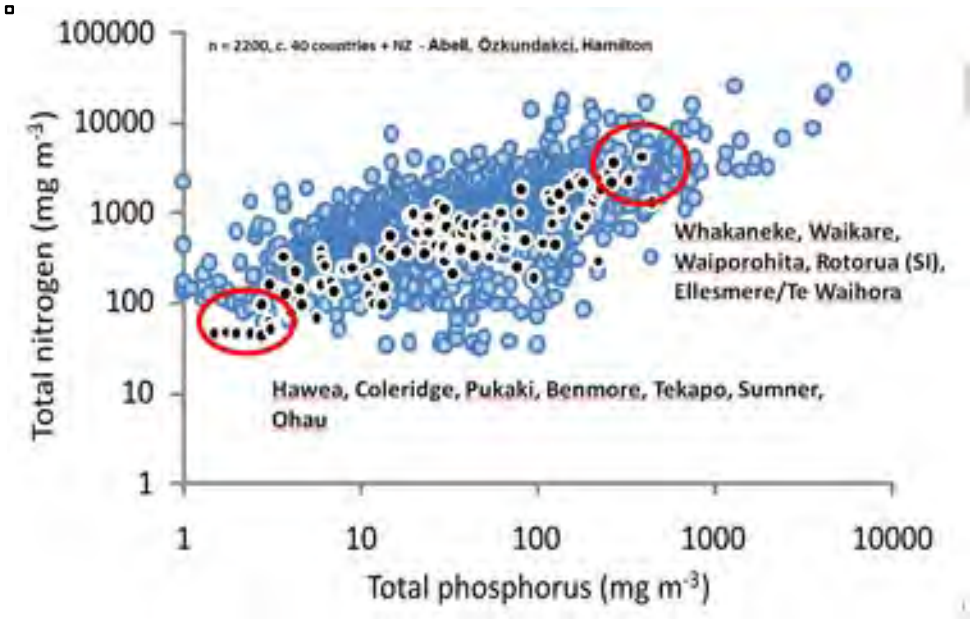


Figure 42: **Plot of nitrogen against phosphorus for 2200 lakes globally showing that as at 2010 New Zealand has lakes in upland South Island that are the best and in lowlands that are among the worst in the world.[1208]**

As with rivers, described above, some of these lakes are suffering toxic cyanobacterial blooms (although in the water column, rather than on the substrate), and pathogen eruptions that threaten human health. Weed and algal blooms leave oxygen-depleted dead zones similar to that described in section 6.2.3 on the Manawatū River. The blooms driven by excess nutrients cause lakes to go soupy and can be many colours depending on the algal species. The alga at such density cause extreme oxygen fluctuations making them untenable for other life forms. Figure 43 shows the green soupy water that is seen in a regular bloom in Lake Horowhenua. Notably, most of these eutrophic lakes are in lowland areas, and 64 per cent are in pastoral catchments. Nearly all healthy monitored lakes – 43 per cent of the total – are in alpine and/or conservation catchments,[1209] geographies that are not affected by intensive agricultural land use.

[1207] Abell, J. M., D. Ozkundakci, and D. P. Hamilton. 2010. Nitrogen and Phosphorus Limitation of Phytoplankton Growth in New Zealand Lakes: Implications for Eutrophication Control. Ecosystems 13:966-977
[1208] Ibid.
[1209] Ibid.

Figure 43: **Philip Taueki in Lake Horowhenua showing a soupy green algal bloom.**[1210]

6.5.2 Lakes in the Inquiry District

The lakes known as dune lakes are in a band from Whanganui in the North to Paekākāriki in the South. They are generally basin lakes i.e. they are lakes formed by the accumulation of rainfall in dune complexes and are thus relatively shallow. Most of the lakes are along the line of the earliest Holocene sea levels and those between Tangimoana and Foxton appear to be related to the margin of the Himatangi anticline. The general theory of their formation is that advancing dunes blocked natural drainage outlets to the coast. The lakes and wetlands present today are a small fraction of the number and area prior to European settlement.[1211]

The Freshwater Ecosystems of New Zealand database (FENZ) reveals that the lowland coastal portions of the Manawatū-Whanganui region contain a relatively large number of dune lakes, comprising 57 of the 330 that occur nationally. The largest is Lake Horowhenua, which at 304 hectares in area is the largest dune lake in the country. Most of the lakes in the region are considerably smaller, typically less than 25 hectares (average 14.6 ha), with the exception of Lake Papaitonga (51 ha). Most of the lakes are

[1210] M White, *The Listener*.
[1211] Adkin, G. L. 1948. Horowhenua: its Māori place names and their topographic and historical background. Department of Internal Affairs, Wellington.

clustered within the landscape occurring along the margins of dune swales where river drainage has been blocked by dune formation.

On an international basis, dune lakes constitute a rare environment class with the only known occurrences in New Zealand, Australia, Madagascar, and the South-Eastern coast of the USA. The greatest abundance occurs along the West Coast of the North Island of New Zealand, particularly through Northland but extending southward through to the Wellington region with a cluster of lakes in the Manawatū-Whanganui region. Seepage outlets and a lack of direct sea connection also means that many dune lakes do not contain diadromous predatory species such as shortfin eels, which tends to enhance populations of threatened galaxiids. Several of the lakes do contain other threatened species such as longfin eels.[1212]

6.5.3 Lake Biodiversity

Coastal tributaries along the Foxton ecological district are particularly significant for īnanga spawning and those that lead to dune lakes provide migrating whitebait (which include threatened species such as īnanga, giant kōkopu and kōaro) access to important habitat in the form of the dune lake. Eleven fish species were found at the 21 Lakes surveyed by Joy in 1999; of those two, Perch and goldfish are introduced species.[1213] Kākahi (freshwater mussels) are currently classified as threatened species in gradual decline and have been confirmed from three of the lower North Island dune lakes: Pauri, Dudding, and Horowhenua.[1214]

6.5.4 Land use Impacts on Dune Lakes

Due largely to their location in the landscape, catchments of most dune lakes in New Zealand have been subject to high degrees of human modification such as forest clearance, agricultural development, and urbanisation. For the dune lake catchments within the Manawatū-Whanganui region this trend was even more pronounced, with on

[1212] Joy, M. K. 1999. Freshwater fish survey of the Manawatū dune lakes. A Report to the Manawatū-Wanganui Regional Council, Massey University, Palmerston North.
[1213] Joy, M. K. 1999. Freshwater fish survey of the Manawatū dune lakes. A Report to the Manawatū-Wanganui Regional Council, Massey University, Palmerston North.
[1214] Personal communication, L Brown. See also https://www.niwa.co.nz/our-science/freshwater/tools/kaitiaki_tools/species/kakahi

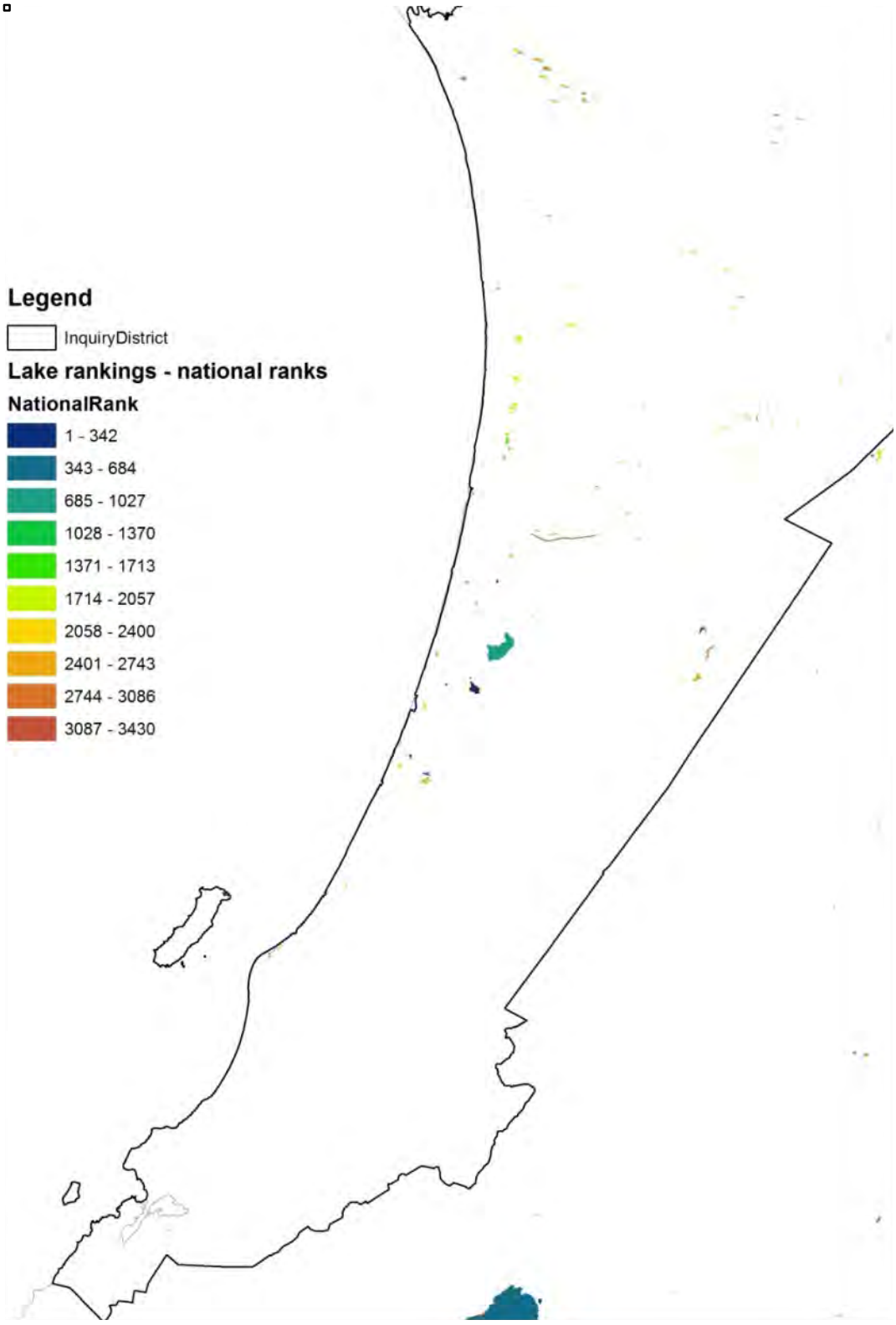
average only 11 per cent of the catchment areas in native vegetation cover and 68 per cent of the catchment converted to pastoral agriculture land use.[1215]

The FENZ ranking of dune lakes within the inquiry district showed they were among the most degraded lake types nationally in terms of their overall catchment condition and were significantly more degraded than all other lake classes (Map 67). Within the inquiry district, catchment condition indexes for all dune lakes were lower than the national average for dune lakes, with the average score for the region of 0.30 compared with 0.35 nationally.[1216] Lake Horowhenua was impacted in many ways by land use change and urbanisation. The first impacts were clearance of wetlands in its catchment, then lake level control and in the mid-1900s municipal wastewater from the town of Levin.[1217] The municipal wastewater discharge has ceased, but storm water and nutrients form intensification of horticulture in the catchment mean the lake is still in a perilous state.

[1215] Kelly, D. J. 2012. Statement of Evidence of David John Kelly on behalf of The Minister of Conservation https://www.horizons.govt.nz/HRC/media/Media/One%20Plan/SWQ-Dave-Kelly.pdf?ext=.pdf

[1216] Kelly, D. J. 2012. Statement of Evidence of David John Kelly on behalf of The Minister of Conservation https://www.horizons.govt.nz/HRC/media/Media/One%20Plan/SWQ-Dave-Kelly.pdf?ext=.pdf

[1217] Selby, R., P. Moore, and M. Mulholland. 2010. Kaitiaki – Māori and the environment. Huia Press, Wellington.



Map 67: **National rankings for lakes in the inquiry district.**[1218]

[1218] Leathwick, J., D. West, W. L. Chadderton, P. Gerbeaux, D. Kelly, H. Robertson, and D. Brown. 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE. . Department of Conservation, Research & Development Division, Hamilton.

6.5.5 Invasive Aquatic Weeds

The dune lakes within the Manawatū-Whanganui region had the highest average proportions of both exotic aquatic plants (45 per cent of lakes) and exotic fish (26 per cent of lakes) in the country. Most of the dune lakes are known to contain exotic aquatic plant species (predominantly hornwort, oxygen weeds, and *Potamogeton cripus*).[1219]

> 'The aquatic pest plant species of significance in the Kāpiti region that are known to the Greater Wellington Regional Council are as follows:
>
> - One site of Manchurian wild rice (*Zizania latifolia*) in the Te Harakeke wetland at Waikanae. Manchurian wild rice is a Notifiable Organism under the Biosecurity Act 1993 and there is a work programme with the Ministry of Primary Industries to control it. This is one of four known sites in the country;
> - Two areas of senegal tea (*Gymnocoronis spilanthoides*); one in Ōtaki and another in suburban lakes in Paraparaumu;
> - Three known sites of purple loosestrife (*Lythrum salicaria*); in Raumati, Otorohanga, and Te Hapua wetland in Waikanae;
> - A number of known sites of hornwort; in the Forest Lakes area and in Paraparaumu;
> - Ferny azolla (*Azolla pinnata*), oxygen weed (*Lagarisiphon major*), and parrots feather (*Myriophyllum aquaticum*) are common;
> - One active eel grass (*Vallisneria spiralis*) site.' [1220]
>
> 'Within the Ngāti Raukawa takiwā there are significant infestations of hornwort, parrots feather, Edgeria densa, Cape Pond lily, and various other noxious weeds. These feature heavily in the Greater Wellington Regional Council aquatic environment such as in Lakes Waiorongomai, Waitawa, and Waimanu (Chrystals Lagoon), as well as in numerous streams for example the Mangapouri, Mangaone, and Rangiuru streams.'[1221]

[1219] Kelly, D. J. 2012. Statement of evidence of David John Kelly on behalf of the Minister of Conservation. https://www.horizons.govt.nz/HRC/media/Media/One%20Plan/SWQ-Dave-Kelly.pdf?ext=.pdf

[1220] Personal communication, Megan Banks, email received after enquires made due to feedback by Pātaka Moore and Caleb Royal during the Draft Report feedback stage, 26 July 2017.

[1221] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

6.6 Groundwater

Groundwaters in agricultural and urban catchments are being degraded by burgeoning nitrate levels at 39 per cent of monitored sites. At a further 21 per cent, groundwater is contaminated, with pathogen levels exceeding human drinking standards.[1222] Many New Zealand drinking supplies are from groundwater, but because private bores are not systematically tested this statistic is likely to be an underestimate. Furthermore, shallow aquifers are usually the first to show declines. This is because pollutants generally sink deeper into formerly unpolluted aquifers over time, again obscuring the true degradation of groundwaters.

Elevated nitrate levels are found in groundwater fed by leachate from pastoral land particularly in catchments predominantly in dairy farming.[1223] Irrigated farms leach more nutrients than non-irrigated due to the increased intensification and higher cow numbers they allow along with more water to flush nutrients through the soil to groundwater.[1224] Dairy intensification can increase nutrient leaching rates by 100 per cent.[1225]

6.6.1 Groundwater in the Inquiry District

The most recent study on groundwater in the Horizons region revealed poor quality at some of the limited number of groundwater monitoring sites.[1226] Challenges exist throughout the entire inquiry district.

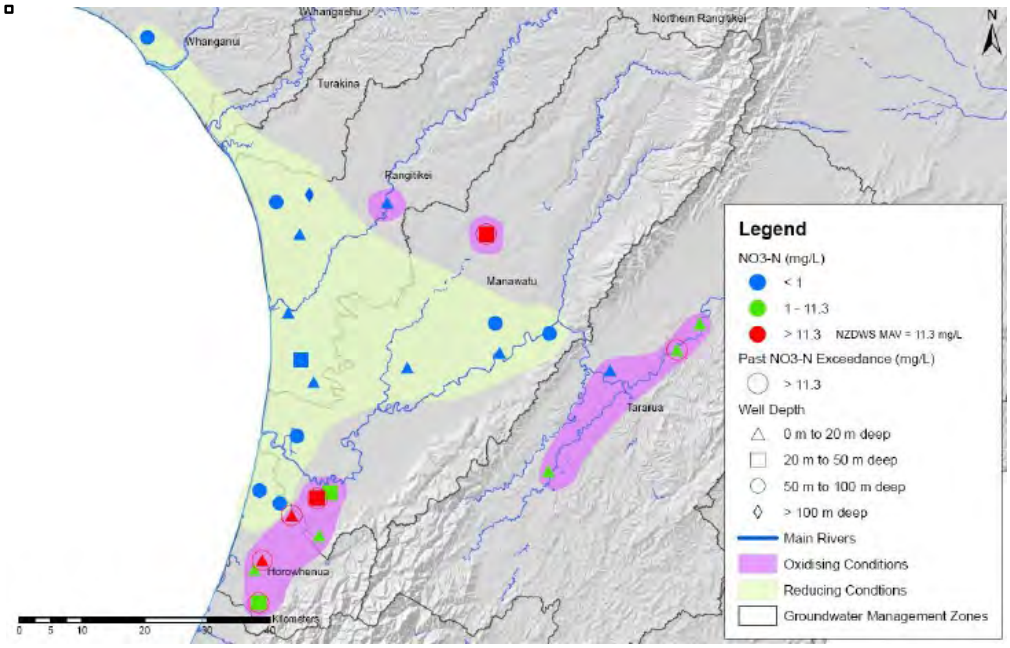
> 'There are known groundwater issues in the Kāpiti district that have been highlighted with the recharging of the Waikanae River with groundwater. High levels of phosphorus in this water have direct links to the proliferation of weeds and potentially harmful cyanobacteria mats. There is very little information on the interaction between groundwater and surface waters. This is particularly important with regard to contaminated ground water resurfacing around the coastal

[1222] Daughney, C. J., and M. Wall. 2007. Groundwater quality in New Zealand: Status and trends 1995-2006. . GNS Science Consultancy Report 2007/23. GNS, Wellington.
[1223] Waikato, E. 2008. The condition of rural water and soil in the Waikato region: Risks and opportunities. Environment Waikato, Hamilton.
[1224] Green, S. R., A. Manderson, B. E. Clothier, A. D. Mackay, and M. Benson. 2012. Catchment-wide modelling of land-use impacts on the Ruataniwha Plains.in 25th Annual FLRC Workshop: Advanced Nutrient Management; Advanced Nutrient Management: Gains from the Past – Goals for the Future, Palmerston North.
[1225] Power, I., S. F. Ledgard, and R. Monaghan. 2002. Nutrient budgets for three mixed farming catchments in New Zealand. MAF technical paper No. 2002/17, MAF Information Bureau, Wellington. MAF technical paper No. 2002/17, Wellington.
[1226] Pattle Delamore Partners LTD 2013. Report on Horizons Groundwater Quality Monitoring Network.

environment, dune lakes, spring heads, and significant sites used for the storage of food. Good examples of this interface are the Mangapouri and Rangiuru Streams. Lakes such as Horowhenua also receive around 50 per cent of their recharge through the groundwater and surface water interface (outlined in the Lake Horowhenua and Hōkio Stream Catchment Management Strategy 1998).'[1227]

6.6.2 Nitrogen in Groundwater

The most recent New Zealand Drinking Water Standards (DWSNZ) specify a maximum acceptable value (MAV) for nitrate-nitrogen of 11.3 g/m³ based on the World Health Organisation (WHO) limits. [1228] Median nitrate nitrogen concentrations for the period 2005 – 2012 exceeded the DWSNZ MAV in four Manawatū wells, with a total of six wells having at least one sample in this time period exceed the MAV. The locations of the wells which have breached the DWSNZ MAV are shown in Map 68. All breaches occurred in wells less than 27 m deep, suggesting effects from agricultural land use and/or domestic wastewater disposal systems.

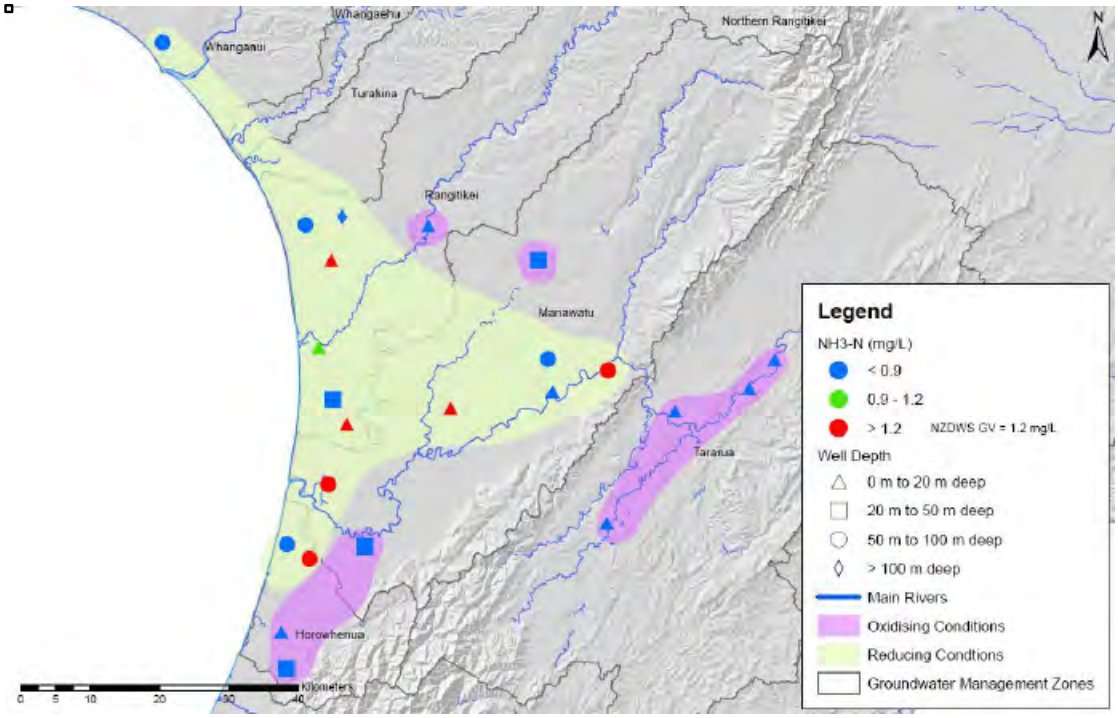


Map 68: **Median nitrate nitrogen concentrations and maximum nitrate nitrogen concentrations that have exceeded the DWSNZ MAV since 2005.[1229]**

[1227] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.
[1228] http://www.health.govt.nz/publication/drinking-water-standards-new-zealand-2005-revised-2008
[1229] Pattle Delamore Partners LTD 2013. Report on Horizons Groundwater Quality Monitoring Network.

6.6.3 Ammonia in Groundwater

The DWSNZ set a limit for ammonia of 1.5 mg/L, equivalent to 1.3 mg/L when reported as ammonia-nitrogen. Map 69 shows the location of wells with elevated ammonia concentrations; six of the wells had median ammonia concentrations above the guideline value (GV) and occur in both shallow (<20 m) and deep wells (50 – 100 m).

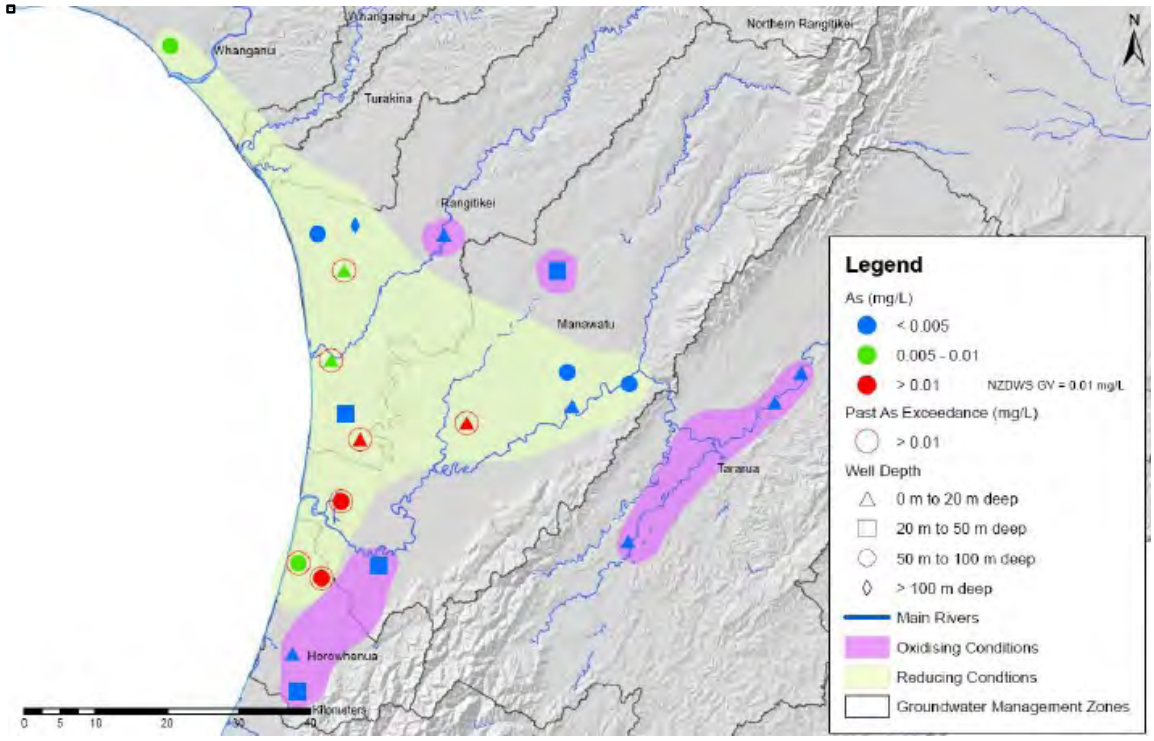


Map 69: **Median total ammonia nitrogen concentrations and breaches of the maximum allowable value (MAV) for the period 2005 – 2012.**[1230]

6.6.4 Arsenic in Groundwater

Of the twenty-two wells in the Manawatū region sampled for arsenic, four had median concentrations above the maximum allowable value (MAV), and in total seven wells had at least one sample with concentrations above the MAV. The location of these wells is shown in Map 70.

[1230] Pattle Delamore Partners LTD 2013. Report on Horizons Groundwater Quality Monitoring Network.

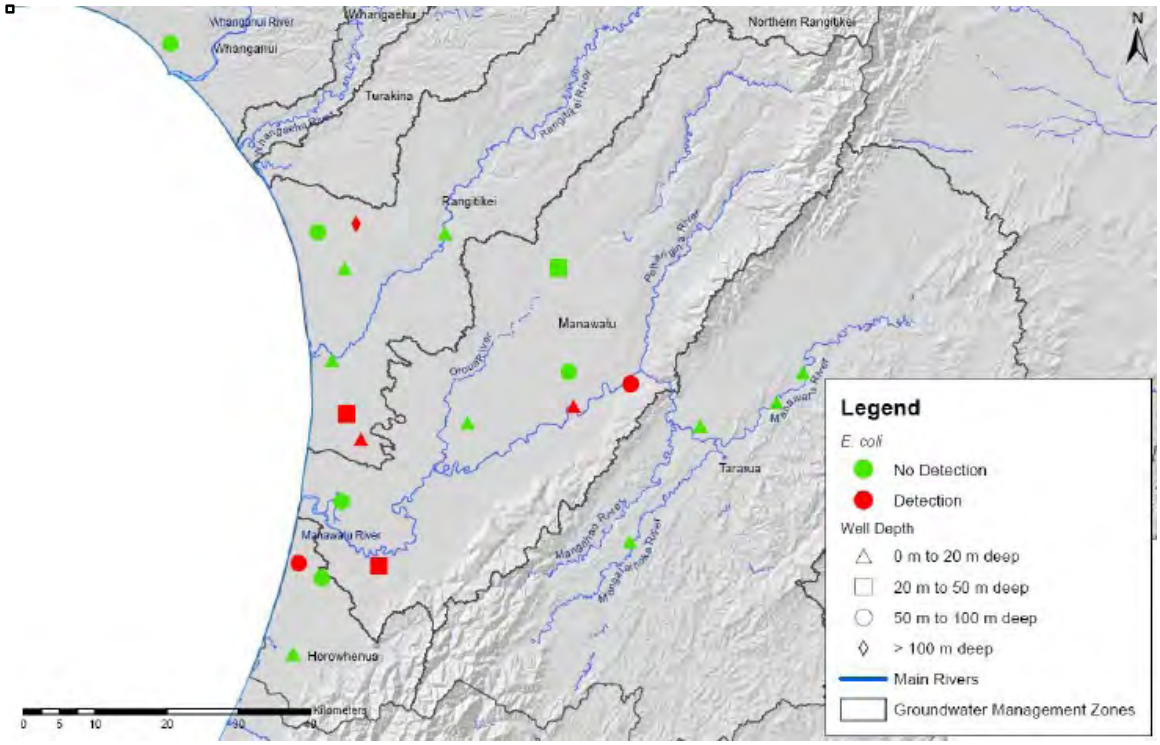


Map 70: **Median Arsenic (As) concentrations and breaches of the MAV for the period 2005 – 2012.**[1231]

6.6.5 Bacteria in Groundwater

Seven of the twenty-two wells analysed for *E. coli* during 2011-2012 had *E. coli* detections in at least one sampling. Any *E. coli* is dangerous to human health and the drinking water standards demand no presence. The depths ranged from 11 metres to 117 metres (Map 71). The presence of *E. coli* indicates that there has been animal faecal contamination and the potential for waterborne diseases.[1232]

[1231] Pattle Delamore Partners LTD 2013. Report on Horizons Groundwater Quality Monitoring Network.
[1232] Ibid.



Map 71: ***E. coli* detections in groundwater samples collected since 2005.**[1233]

6.7 Freshwater Biodiversity

Freshwater biodiversity includes fish, which are covered in Chapter 7, but in this section biodiversity is covered as an indication of water quality and ecosystem health. The limitations noted earlier in this chapter of the contemporary water quality measures are mostly overcome by the use of bioassessment. Bioassessment is the use of the biota to give a measure of the ecosystem health of a system.

The environmental impacts described in this report, plus many more, have had a major effect on New Zealand's biodiversity.[1234] New Zealand now has the highest proportion of threatened and at-risk species in the world.[1235] Around one-third (2788) of all native plants and animals are listed by the Department of Conservation as threatened or "at risk", and a further one-third as "data-deficient".[1236] The latter tend to be the ones that are rare or can't be found, so their number could be much higher if the resources and scientists were available to investigate further. Some of the worst statistics relate to the 54

[1233] Pattle Delamore Partners LTD 2013. Report on Horizons Groundwater Quality Monitoring Network.
[1234] Brown, M., T. Stephens, R. Peart, and B. Fedder. 2015. Vanishing Nature: facing New Zealand's biodiversity crisis. Environmental Defence Society, Auckland.
[1235] Seabrook-Davison, M. N. H. 2010. An evaluation of the conservation of New Zealand's threatened biodiversity
[1236] Ibid.

native freshwater fish species: the number under threat has greatly increased in the past 20 years from about 20 per cent in the early 1990s to 74 per cent in 2013 (Figure 44). Freshwater crayfish and New Zealand's only freshwater mussel are also listed as threatened with extinction.[1237]

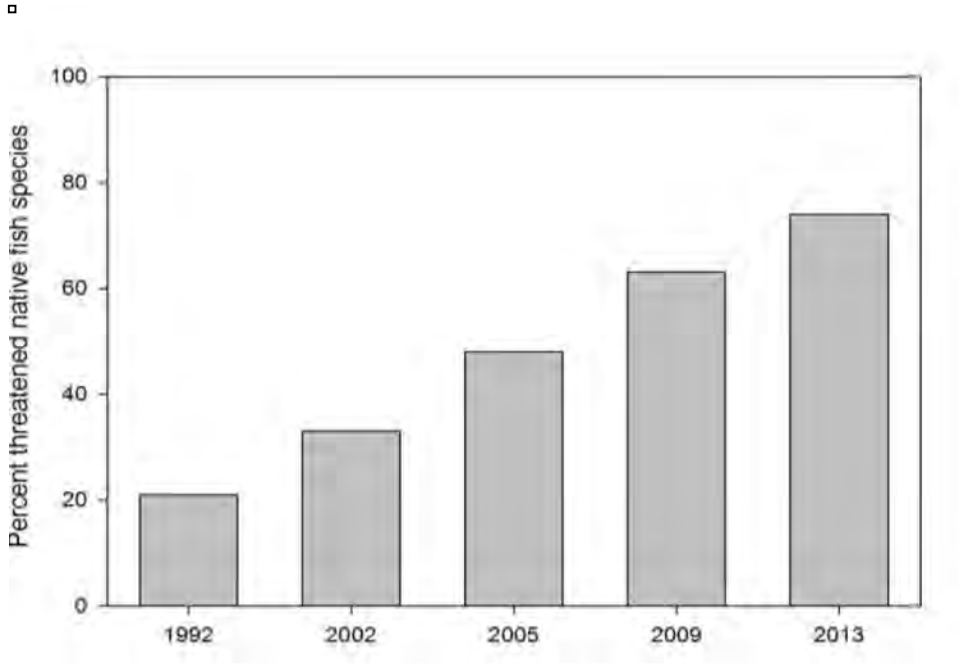


Figure 44: **The proportion of threatened or at risk freshwater fish species in New Zealand since the first classification in 1992.[1238]**

This is the highest proportion of threatened freshwater fish species reported anywhere in the world, and reveals much about the extent of degradation of fresh waters in New Zealand.[1239]

Because they sit at the top of freshwater food webs, these fish are highly sensitive indicators of changes in river health; in effect, they are the fresh water equivalent of miners' canaries. Research, using about forty years of data from 25,000 samples in the New Zealand freshwater fish database, clearly shows that if native fish continue to

[1237] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1238] Joy, M. K. 2015. Freshwaters in New Zealand. Pages 227 - 239 in A. Stow, N. Maclean, and G. Holwell, editors. Austral Ark; The State of Wildlife in Australia and New Zealand. Cambridge University Press, Cambridge.

[1239] Ibid.

decline at the rate they have been, then most if not all will be extinct by 2050 (Figure 45).[1240]

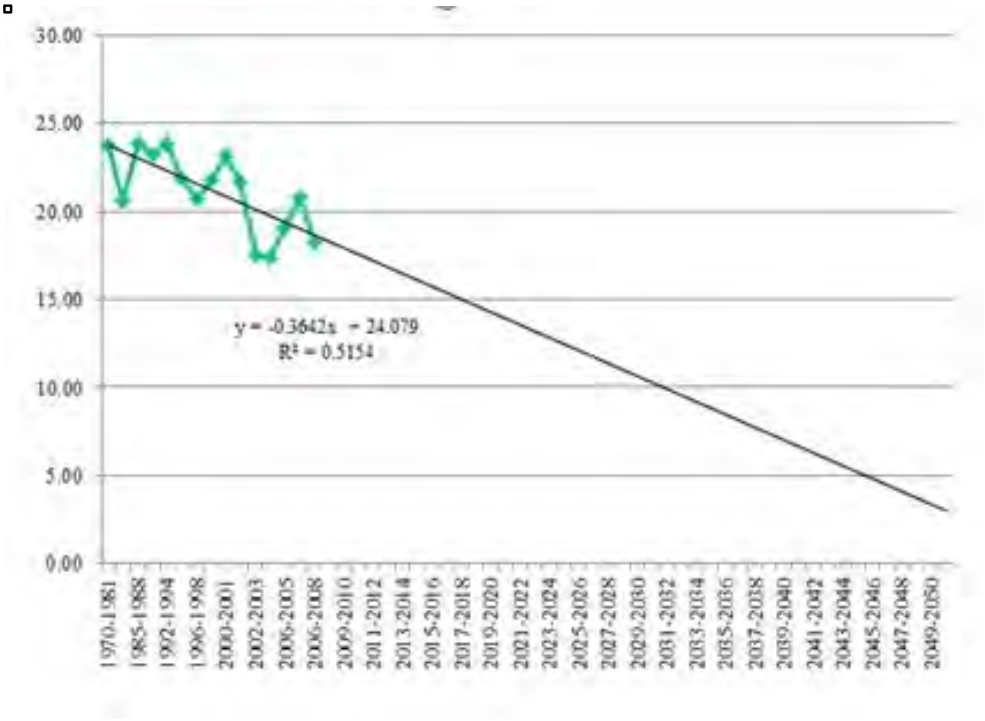


Figure 45: **The fish index of biotic integrity (NZ fish IBI) score from 1970 to 2010 based on ~25,000 sites in the New Zealand Freshwater Fish Database and projection into the future using a linear regression line fitted to the scores (the different sampling years are to give the same number of sites in each group).[1241]**

6.7.1 Freshwater Biodiversity in the Inquiry District

Much of the freshwater biodiversity in freshwater ecosystems are microscopic and only become obvious when they reach unnatural levels, for example when algae becomes so proliferate they creates algal blooms. There are different types of water plants, known as macrophytes: bryophytes (liverworts and mosses), filamentous algae, diatoms, and cyanobacteria (blue-green algae). These are the primary productive base of the food webs in aquatic systems. These varied aquatic plants are then fed on by aquatic macroinvertebrates, mostly insects but also molluscs, crustaceans, and worms. The next trophic level contains the predators such as fish and larval insects and birds. The apex predators are the larger fish and birds.

[1240] Joy, M. K. 2009. Temporal and land-cover trends in freshwater fish communities in New Zealand's rivers: an analysis of data from the New Zealand Freshwater Database - 1970 - 2007 A report to the Ministry for the Ministry for the Environment. Massey University

[1241] Joy, M. K. 2009. Temporal and land-cover trends in freshwater fish communities in New Zealand's rivers: an analysis of data from the New Zealand Freshwater Database - 1970 - 2007 A report to the Ministry for the Ministry for the Environment. Massey University

Records in the New Zealand Freshwater fish database over the last 40 years show 19 native freshwater fish fauna in the inquiry district and six estuarine and marine wanderers.[1242] There is a decline in fish species diversity with increasing elevation, found all over New Zealand, and this is related to the high proportion of diadromous (migratory) species.[1243]

6.7.2 Kākahi (Hyridella menziesior)

Freshwater mussels are also considered a significant traditional food by Māori, being highly valued as food for the young or infirm. Freshwater mussels are found in lakes, rivers, and streams throughout the country, but most of the information on their biology come from lake or impounded river populations. Anecdotal evidence from the Whanganui River catchment suggests kākahi have been declining since the turn of the 20th century due to declining water quality.[1244]

6.8 Bioassessment of Rivers

The most holistic and comprehensive measure of a river or stream's ecological health is the health of the community of animals living in it. Invertebrates and fish are great indicators of ecosystem health because they integrate all the processes and chemistry of the ecosystems. Fish and some insects live for many years so they reflect the health of freshwater ecosystems much better than one-off chemical samples that can vary widely (as with dissolved oxygen variability, which is discussed in the section on nitrogen above), especially in degraded systems. The assessment of waterway health using biology is known as bioassessment, and is done by applying scores to various species: higher scores for those found in healthy systems and lower for those in degraded ones. The macroinvertebrate community index ("MCI") is a commonly used, scientifically robust, and well-accepted measure of organic enrichment; it has a long history of use in New Zealand and is based on the response of individual species to rising nutrient levels. Given the science and history behind it, the omission of the MCI from the current NPS-FM has caused considerable conjecture. This is an issue that will be covered later in this evidence.

[1242] McDowall, R. M., and J. Richardson. 1983. The New Zealand freshwater fish survey-a guide to input and output. Fisheries Research Division Information leaflet 12, Ministry of agriculture and Fisheries, Wellington

[1243] Joy, M. K., I. M. Henderson, and R. G. Death. 2000. Diadromy and longitudinal patterns of upstream penetration of freshwater fish in Taranaki, New Zealand. New Zealand Journal of Marine and Freshwater Research 34:531-543.

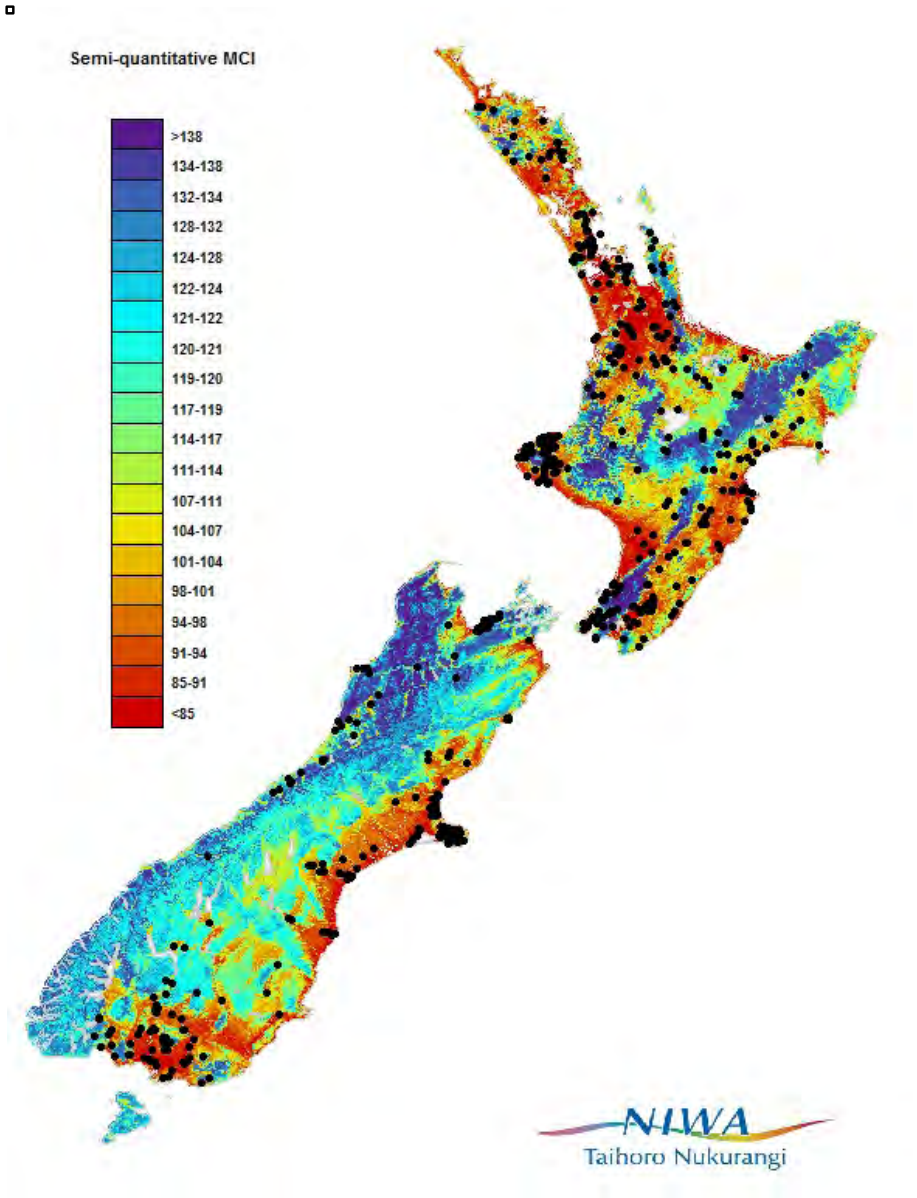
[1244] Horrox, J. 1998. Benthic communities of the Whanganui River catchment and the effects of land use and geology. Massey University, Palmerston North.

NIWA's national distribution of modelled MCI scores shows the polluted waterways in this country; mirroring the nutrient hot areas, the lowest scores are mainly located in lowland New Zealand where intensive agriculture occurs and the highly urbanised stream environments of the Auckland Region.[1245] Most lowland waterways in pasture catchments are classed as moderately or severely polluted. However, the West Coast, the East Cape coast, and the Coromandel Peninsula show that lowland waterways in undeveloped or well-managed catchments still enjoy good health (Map 72).

> 'It is worth noting that the Macroinvertebrate Community Index (MCI) and other bio-assessments have not been developed to include or consider the values of Māori. The MCI as an example does not place additional significance on the abundance of freshwater shrimps found in our lowland streams and lakes. These shrimps play a significant role in sustaining higher order predator species such as tuna, and also impart the sweet flavour that tuna feeding on shrimp are known for.
>
> The same could be said about the abundance of common bullies and īnanga in coastal lakes in the inquiry district. They are a critical part of the food chain that sustains tūturu taonga species such as tuna. While the bioassessment work is valuable, it is not informed by Māori values or interpreted against Māori values and so bioassessment results do not, therefore, adequately represent Māori stream values.'[1246]

[1245] Unwin, M. J., and S. T. Larned. 2013. Statistical Models, Indicators and Trend Analyses for Reporting National-scale River Water Quality) (NEMAR Phase 3). . NIWA, Wellington.

[1246] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.



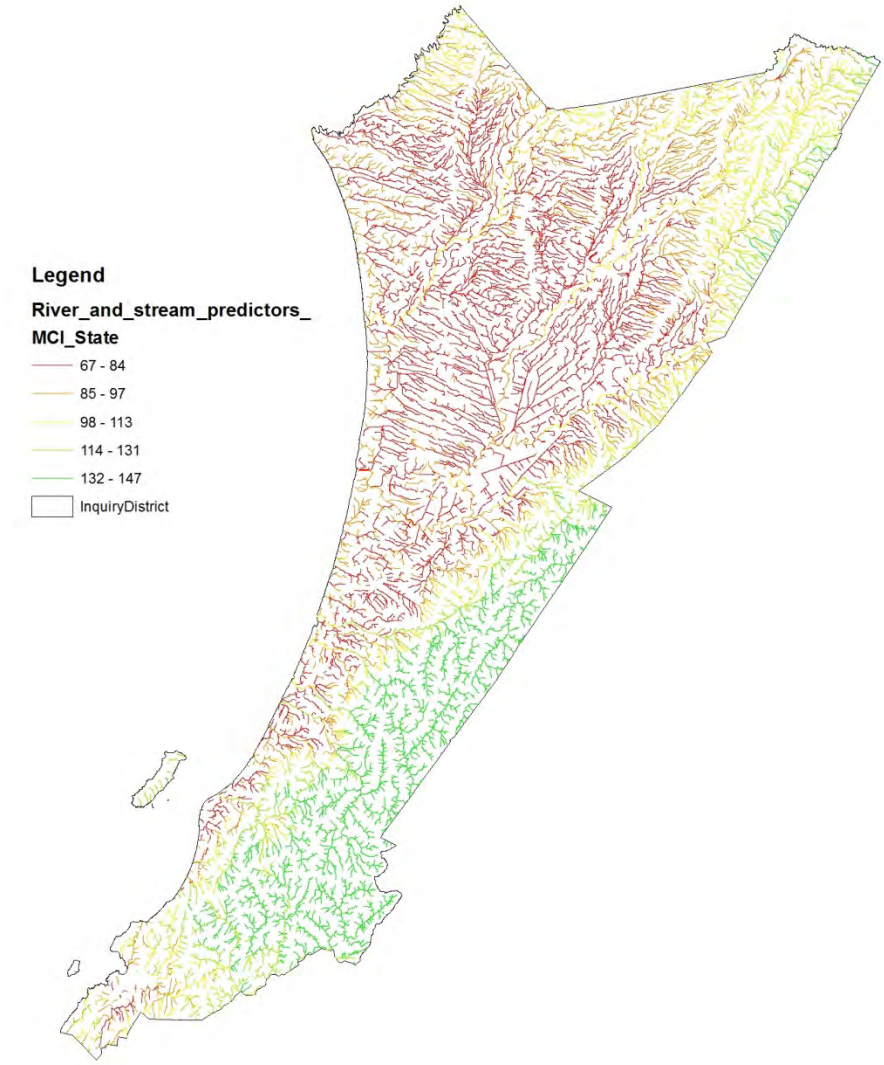
Map 72: **Map of predicted MCI. All dark orange and red score either < 100 moderately polluted or < 80 severely polluted.**[1247]

6.8.1 Macroinvertebrate Community Index (MCI) in the Inquiry District

The predictive map (Map 73) for the inquiry district reveals the degraded lowland waterways with most of the lowland reaches scoring below 100, thus severely (<80) or moderately (80 – 100) polluted.[1248]

[1247] Ibid.

[1248] J Clapcott, EO Goodwin, T Snelder, K Collier, and M Neale (forthcoming), 'A Comparison of Model Approaches for Predicting Benchmarks for Macroinvertebrate Community Metrics', in *New Zealand Journal of Marine and Freshwater Research*, 2017.



Map 73: **Predicted MCI scores for the inquiry district.**[1249]

Two lowland sites in the Lake Horowhenua catchment (Arawhata Stream at Hōkio Beach Road and Hōkio Stream lake outlet weir) have been rated as consistently poor by the MCI with MCI values in 2014-2015 of 55-75 (Table 7).[1250] All sites apart from Waikawa fail Horizons targets and are classed as either moderately (<100) or severely polluted (< 80), with the Manawatū and Oroua rivers as the most severely polluted. An iwi assessment done in 2013 showed invertebrate communities declined in the Oroua River and its tributaries downstream from the headwaters and were worst below Feilding[1251].

[1249] Ibid.
[1250] Stark, J. D. 2016. Aquatic Invertebrate Communities of the Manawatū-Wanganui Region Trends in River Health. Stark Environmental ltd for Horizons.
[1251] Michael Cribb, Thomas Tane, Anthony Bowler, and A. Spinks. 2013. Ngā Kaitiaki o Ngāti Kauwhata Oroua River Aquatic Insect Monitoring Report; Prepared for the Integrated Freshwater Solutions Project.

Table 7: **Macroinvertebrate community index scores for sites in the Horizons region**[1252]

Site	# samples	Mean MCI	Meets target	per cent of samples not meeting target
Manawatū at Opiki	9	84	No	78
Manawatū at Teachers College	13	96	No	62
Oroua at Awahuri	13	90	No	67
Waikawa at Nth Manakau	3	135	Yes	0
Hōkio Lake outlet	3	70	No	100
Kahuterawa at Johnstown's	4	108	No	100

6.8.2 Fish Index of Biotic Integrity (FIBI) Ecosystem Health

Freshwater fish are also used by many regional councils to assess ecosystem health by means of the Index of Biotic Integrity (IBI).[1253] The fish IBI is a measure of the fish community at a site taking into account natural differences over elevational trajectories. A low fish IBI score indicates reduced fish biodiversity at the site and uses metrics based on human induced impacts. Thus, it is a bioassessment metric: a fish version of the MCI (the maximum IBI score is 60). A report for the Ministry for the Environment using the fish IBI shows clearly the impact on fish communities and ecosystem health in pastoral and urban catchments.[1254] Over the last four decades time scores have declined at all sites (Figure 46, top left plot). The other plots show declines over time at pasture sites, less so at scrub sites, and no decline at indigenous forest sites (Figure 46).

[1252] Stark, J. D. 2016. Aquatic Invertebrate Communities of the Manawatū-Wanganui Region Trends in River Health. Stark Environmental ltd for Horizons.

[1253] Joy, M., and R. Death. 2004. Application of the index of biotic integrity methodology to New Zealand freshwater fish communities. Environmental Management 34:415-428.

[1254] Joy, M. K. 2009. Temporal and land-cover trends in freshwater fish communities in New Zealand's rivers: an analysis of data from the New Zealand Freshwater Database - 1970 - 2007 A report to the Ministry for the Ministry for the Environment. Massey University

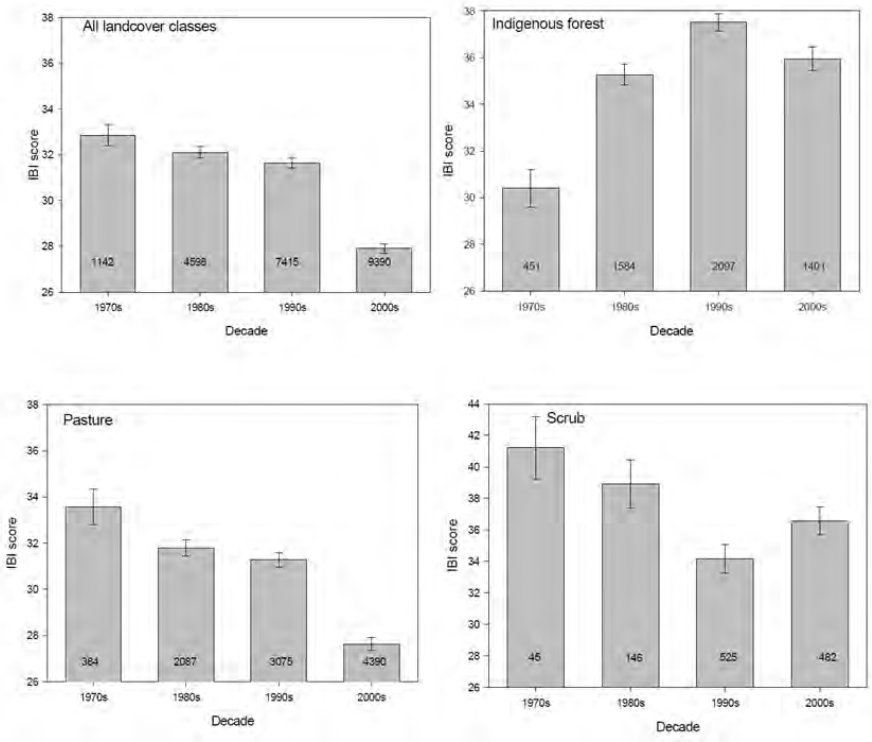


Figure 46: **Fish IBI decadal average scores (± SE) showing all River Environment Classification (REC) land cover classes, indigenous forest, scrub, and pasture (clockwise from top left). The declining average scores for all land cover classes show that for the whole country at all sites fish biodiversity and river health is dropping every decade. The indigenous forest and scrub sites show some increasing or steady decadal changes. The pasture catchment sites (bottom left) reveal significant declines every decade.**[1255]

Analysis of the freshwater fish data available for the Manawatū-Whanganui Region reveals similar patterns with the lowest number of sites classed as excellent fish IBI scores in high intensity pasture, exotic forest, and urban sites (Figure 47).[1256] Most excellent sites were in low intensity pasture native forest and scrub sites.

[1255] Joy, M. K. 2009. Temporal and land-cover trends in freshwater fish communities in New Zealand's rivers: an analysis of data from the New Zealand Freshwater Database - 1970 - 2007 A report to the Ministry for the Ministry for the Environment. Massey University

[1256] Joy, M. K. 2016. A Fish Index of Biotic Integrity (IBI) For Horizons Regional Council. Massey University.

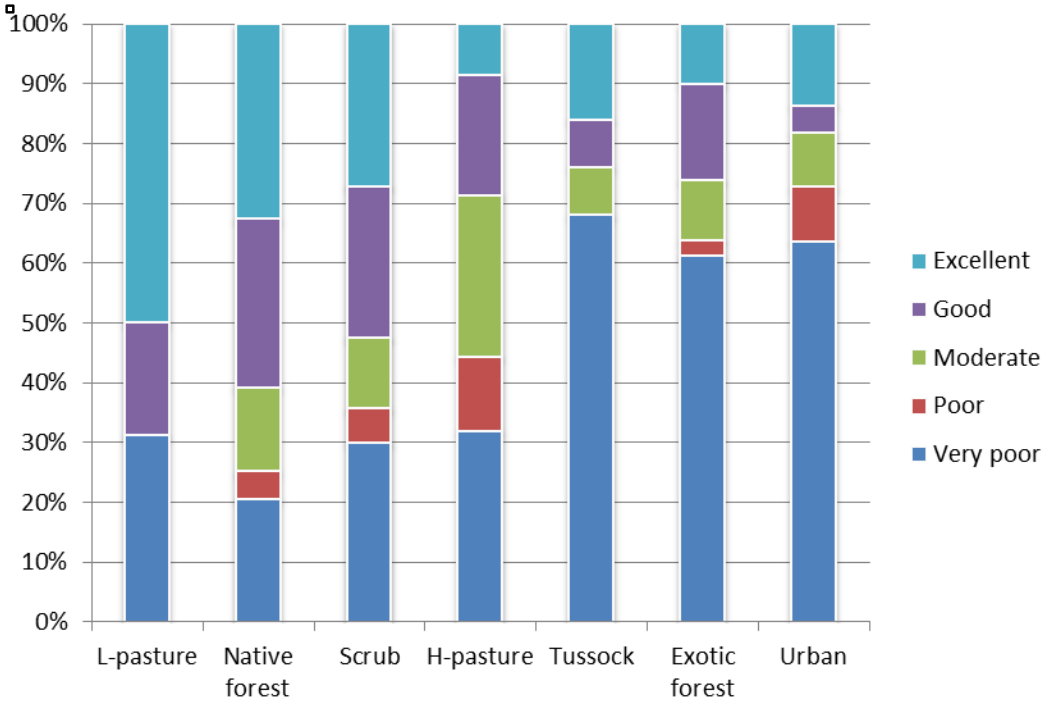


Figure 47: **Fish IBI scores for the Horizons Regional Council freshwater fish sites**[1257]

6.9 Urban Water Quality Issues

While urban waterways make up less than one per cent of the length of all of New Zealand's waterways, they have some of the worst water quality. Half of the sites in urban catchments nationally have an MCI score of less than 80 (severely polluted).[1258,1259] The causes of these poor conditions are many but include the fact that a large proportion of an urban catchment area is impervious, so that rainfall events very quickly run-off into waterways changing the hydrology and making them very hydrologically 'flashy' (this means they have sudden and intense changes in flow).

An example of the impacts of urbanisation on waterways in the inquiry district is seen in the Porirua Stream. The water quality of the Porirua Stream is tested monthly at two locations (Glenside and Wall Park) as part of Greater Wellington Regional Council's rivers state of the environment water quality monitoring programme. The most recent

[1257] Joy, M. K. 2016. A Fish Index Of Biotic Integrity (IBI) For Horizons Regional Council. Massey University.

[1258] Ministry for the Environment. 2015. Freshwater Programme: Managing within limits, pressures and opportunities. . Ministry for the Environment, Wellington.

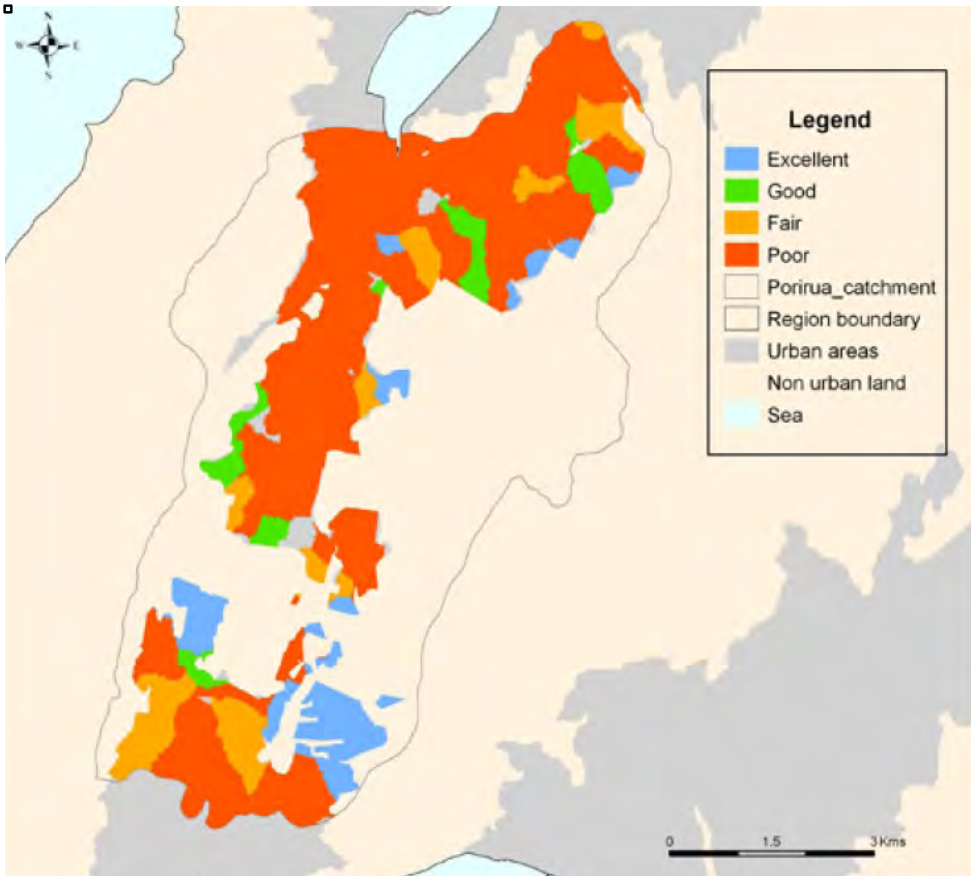
[1259] The MCI is a measure of the ecological health of a site based on its invertebrate community. It is used in New Zealand by all Regional Councils and was first developed in 1985[1259]. The maximum score is 160 and the minimum is zero, and scores have been broken into classes with less than 80 being classed as severely polluted.

annual freshwater quality report classifies water quality in Porirua Stream as "poor" at both sites.[1260] This is because of elevated faecal bacteria, dissolved nutrient concentrations, and poor water clarity. Aquatic ecosystem health, as measured through biotic indices such as the MCI, was classified as fair. Contamination of fresh water by microbial organisms such as faecal bacteria is a significant contributor to poor water quality. The elevated faecal bacteria levels, coupled with elevated dissolved nitrogen concentrations, indicate that there may be significant sewage/stormwater cross connection issues in the catchment.

The Porirua Stream catchment has significant areas of impervious area with most of the low elevation areas classed as poor or fair (Map 74).[1261] Vegetated catchments act as a sponge and store water so it is slowly released. In contrast, water immediately runs off in impervious catchments. Also, run-off includes eco-toxic contaminants such as heavy metals from roofs, brake linings, and car tyres. This has implications for food gathered from waterways, beaches, and harbours, as well as from freshwater ecosystems.

[1260] Perrie, A. 2008. Annual freshwater quality monitoring report for the Wellington region, 2007/08. Publication No. GW/EMI-T-08/161., Greater Wellington Regional Council, Wellington

[1261] Blaschke, P. M., C. Anstey, and F. Forsyth. 2009. Ecological restoration priorities for the Porirua Stream and its catchment. Blaschke and Rutherford Environmental Consultants, Wellington



Map 74: **Imperviousness in the Porirua catchment: 0 – 5 per cent Excellent, 5 – 15 per cent Good, 15 – 20 per cent Fair, or 20 – 100 per cent Poor.**[1262]

Another impact on urban waterways is the replacement of open streams with pipes. Investigation into the piping of streams shows that in the last five years, 4.7 kilometres of tributaries of the Porirua stream were put into pipes. The Porirua stream tributaries contributed the greatest amount of loss of streams through piping or reclamation in the Wellington region, accounting for more than a third of stream loss in the entire region.[1263]

Flood management in cities means that streams are often channelised, straightened, and sometimes concreted (Figure 48). This is done to enable movement of water out to sea as quickly as possible in rain events. This obviously compromises instream habitats for fish and invertebrates as there is no cover and no refuge in high flows. Concrete lined waterways, like the one in Figure 48, lose their connection to beds as the interstitial

[1262] Blaschke, P. M., C. Anstey, and F. Forsyth. 2009. Ecological restoration priorities for the Porirua Stream and its catchment. Blaschke and Rutherford Environmental Consultants, Wellington
[1263] Ibid.

spaces that are crucial habitats for fish and invertebrates are no longer accessible.[1264] Sedimentation is also a significant issue in urban streams, blocking the interstitial spaces and having large impacts on the coastal receiving environments: the estuaries and harbours.[1265] An example of this is the Porirua Stream that enters the southern end of the Onepoto Arm of Porirua Harbour and is the major freshwater input to the Onepoto Arm. Monitoring and investigations by Greater Wellington Regional Council indicate that, along with sediment, the stream carries significant nutrient, toxicant, and pathogen loads to the Onepoto Arm, especially after high rainfall events.[1266] Elevated concentrations of zinc and copper are also present in the surface sediments in the southern end of the Onepoto Arm.

Figure 48: **The Porirua Stream in Porirua near the railway station, an urban stream showing artificial banks.**

Urban waterways also have human health issues indicated by high pathogen loads, with catchments from urban areas in Auckland having 84 times the median *E. coli* concentration of catchments that have predominately indigenous vegetation cover.[1267] Urban areas are growing quickly, particularly in the Wellington Region where projections

[1264] McEwan, A., and M. Joy. 2014. Habitat use of redfin bullies (Gobiomorphus huttoni) in a small upland stream in Manawatū, New Zealand. Environmental Biology of Fishes 97:121-132.

[1265] Morrison, M. A., M. Lowe, D. Parson, N. Usmar, and I. McLeod. 2008. A review of land-based effects on coastal fisheries and supporting biodiversity in New Zealand. Report, NIWA, Auckland.

[1266] Blaschke, P. M., C. Anstey, and F. Forsyth. 2009. Ecological restoration priorities for the Porirua Stream and its catchment. Blaschke and Rutherford Environmental Consultants, Wellington

[1267] Ministry for the Environment. 2015. Freshwater Programme: Managing within limits, pressures and opportunities. Ministry for the Environment, Wellington.

are for significant population growth, and thus, these issues are likely to worsen over time.

Many urban areas already have serious issues with failing or overloaded wastewater infrastructure and this has impacts through untreated effluent finding its way into waterways and overloaded wastewater treatment plants failing to meet resource consent conditions. For example, the Manawatū District Council wastewater treatment plant in Feilding into the Oroua River has very rarely ever complied with discharge resource consent conditions in more than two decades of consented operations.[1268]

6.10 Pollution Sources

6.10.1 Influence of Land Use on Water Quality

The measures of water quality in the Manawatū River catchment reveal they are strongly related to land use. Agricultural land-use was related to degradation showing positive correlations with nutrients and pathogens, whereas native and exotic forest catchment sites were correlated with good water quality measures (negative correlations).[1269] Dairy farming land use had the highest correlation with nitrogen, while sheep and beef land use was highly correlated with pathogens and phosphorus. Pastoral farming that is a combination of sheep, beef and dairy was highly correlated with both nutrients and pathogens. However, forestry and native forest was negatively correlated with all measures.

[1268] Rose, R. 2014. Section 42a Compliance Hearing Report, Resource Consent applications. 106945-106951 and 107070-107072, Notice of Requirement application NOR8359. Horizons Regional Council, Palmerston North.

[1269] Ballantine, D., and R. J. Davies-Colley. 2009. Water Quality State and Trends in the Horizons Region NIWA, Hamilton.

Table 8: **Spearman rank correlations between median water quality variable concentration and catchment land use. Significant correlations highlighted by asterisk and colours; Red shows land use is related to degradation (positive correlations) and green shows land use related to better water quality (Significance 10 per cent *; 5 per cent ** and 1 per cent ***) (table 5 pg. 15).** [1270]

Measure	per cent Diary	per cent Sheep and Beef	per cent Pastoral (sheep beef and dairy)	per cent native forest	per cent Forestry exotic
Phosphorus (DRP)	0.378	0.552**	0.534**	-0.433*	-0.443*
Nitrogen (SIN)	0.62***	0.596**	0.777***	-0.762***	-0.78***
Pathogens (E. coli)	0.008	0.753***	0.61***	-0.519**	-0.511**

6.10.2 Nutrient Loads

The nutrient loads in rivers in the Manawatū confirm the correlations with land use and reveal that the majority of nutrients in lowland rivers come from diffuse sources rather than point sources (out of pipe). The Manawatū River at its gorge carries 2280 tonnes of nitrogen, of which only 1.2 per cent (29 tonnes) is from point sources, and 54 tonnes of phosphorus, of which 13 per cent (7 tonnes) is from point source origin.[1271] In the Waikawa Stream, 100 per cent of the nitrogen and phosphorus load is from diffuse sources. The progression downstream of the accumulation of nitrogen from Weber Road to Opiki Bridge can be seen clearly in Figure 49, as well as the variability at different flows.

[1270] Ibid.

[1271] Roygard, J., K. Mcarthur, and M. Clarke. 2012. Environment Court Expert statement technical evidence - Oneplan appeal. Horizons Regional Council.

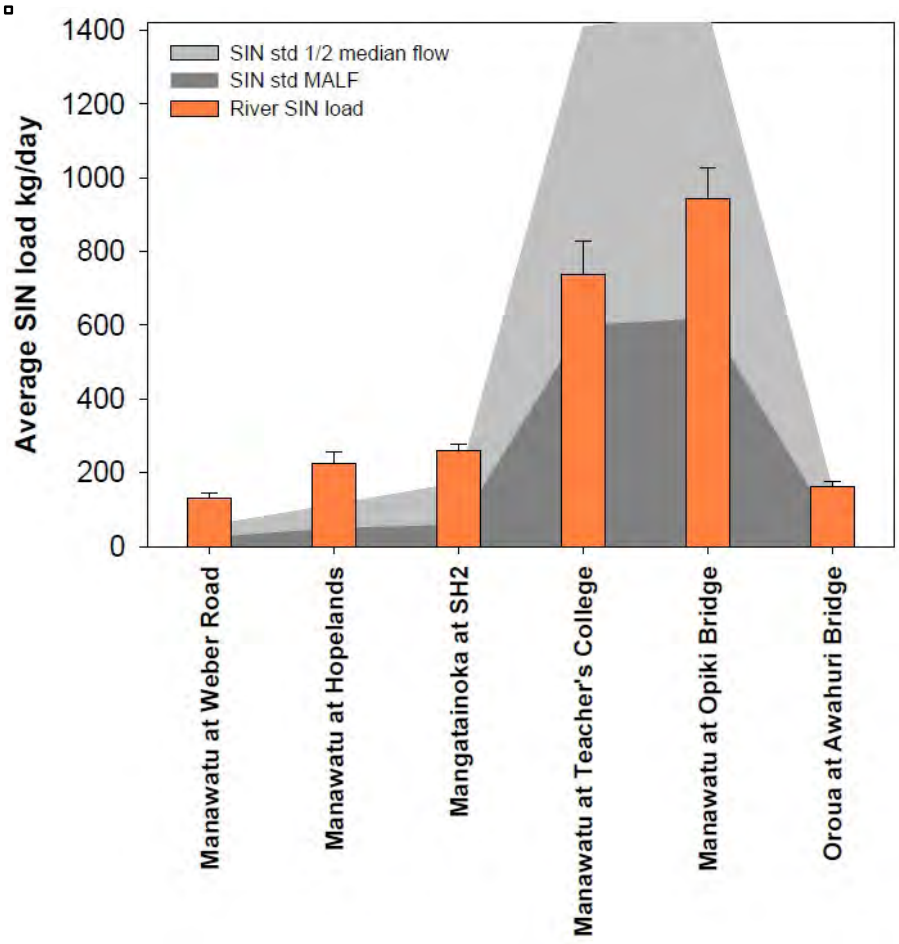


Figure 49: **Nitrogen Loads in the Manawatū catchment at different flows[1272]. SIN = Soluble inorganic nitrogen.**

Nutrients that are not assimilated by alga or sediments are exported downstream where they have impacts on estuarine and coastal ecosystems. In the case of the Manawatū, the receiving area for all the pollutants – nutrients, pathogens, and sediment - is the Manawatū Estuary, a Ramsar designated wetland of international significance. [1273] Adverse effects on the estuary include nuisance growth of macro algae, anoxia of estuarine sediments and water resulting in death of estuarine fauna, as well as adverse effects on amenity and food gathering.

Finally, the nutrients and pathogens not assimilated in the river or estuary are then exported to the coastal seawater, where they can have detrimental effects from algal growth and impact on swimming. Algal blooms are commonly reported at Himatangi,

[1272] Roygard, J., and M. Clark. 2007. Nitrogen and Phosphorus Loads to Rivers in the Manawatū-Wanganui Region: An Analysis of Low Flow State. 2007/EXT/793, Horizons, Palmerston North.

[1273] http://www.ramsar.org/

Foxton, and Waitarere beaches and complaints from the public about this are often fielded by regional council staff. These blooms show up as surf-alga, a brown/green scum that washes up on beaches and is often mistaken for cow faeces. The increased nutrient levels in sea water at popular beaches are revealed in Figure 50 with high chlorophyll a concentrations and contrast with the lower levels at beaches without large rivers with high nutrient loads (such as Kai Iwi and Akitio beach).[1274]

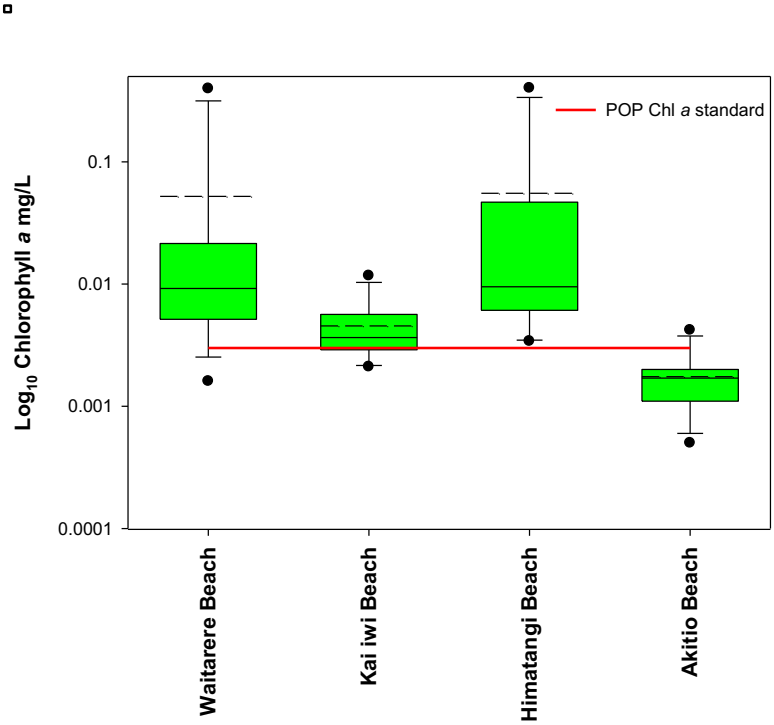


Figure 50: **Log10 seawater chlorophyll a concentrations (mg/L) collected monthly (Jan-Dec 2011) from Horizons coastal monitoring sites.**[1275]

6.11 Central and Local Government Failures

The failure of the Crown to protect inland waterways can be seen in the failings of both central and local government to limit impacts. The poor water quality in urban waterways and coastal receiving environments is fundamentally the result of three factors that are all working together. They are, first, inadequate national bottom lines for ecosystem health; second and consequently, inappropriate authorisations of activities (including through discharge permits and resource consents) that harm water ecosystems; and, third, poor

[1274] McArthur, K. 2014. Statement of evidence by Kathryn Jane McArthur at a joint hearing of applications for resource consents and a notice of requirement lodged by Manawatū District Council (Infrastructure Group) in relation to the treatment and disposal of treated wastewater from the Feilding Wastewater Treatment Plant.

[1275] Ibid.

information gathering and oversight of the existing regime, including inadequate steps being taken to determine and enforce compliance with ecological bottom lines. For example, when wastewater treatment plants are allowed to continually breach consent conditions, as with the Manawatū and Oroua examples (and there are many more examples),[1276] then there is no pressure to make upgrades as required – if an operator can get away with doing nothing and save money they are incentivised to do nothing.

A further example of the failure of councils to address issues is a survey that showed that many councils have identified capability or capacity issues in relation to their ability to implement the NPS-FM.[1277] It can also be noted that, at a national scale, the majority of existing resource consents will not expire until 2027.[1278] These facts, individually and together, will contribute to further water quality degradation and, potentially and all else being equal, a reaching of further ecological tipping points before resource consents expire.

> 'This is an important section as it illustrates that by failing to protect the waterways, the Crown has actually facilitated the demise of freshwater. While the RMA states that all persons exercising functions and powers under the RMA must 'recognise and provide for the relationship of Māori with their waters…', the Crown has set bottom lines that allow polluters to undermine this relationship. Furthermore, the Crown has not invested resources to develop indices or parameters that could be used to benchmark how the national bottom-lines relate to the 'provision of a relationship to waters'. This has led to science being placed in the ascendant, both in the field of resource development and data generation. This information is subsequently used in the courts where Māori are forced to defend the nature of their relationship, without resources or data sets. Given the investment in the ill-founded scientific measures, and the neglect of Māori indices and parameters, it is 'normal' for decisions made in resource consent hearings and the Environment Court to be made in favour of the polluter. It could be argued

[1276] Rose, R. 2014. Section 42a Compliance Hearing Report, Resource Consent applications. 106945-106951 and 107070-107072, Notice of Requirement application NOR8359. Horizons Regional Council, Palmerston North.

[1277] Ministry for the Environment. 2015. Freshwater Programme: Managing within limits, pressures and opportunities. . Ministry for the Environment, Wellington.

[1278] Ministry for the Environment. 2015. Freshwater Programme: Managing within limits, pressures and opportunities. . Ministry for the Environment, Wellington. (pp56-58, paras 2-4)

that science, policy, and law have been used to racially prejudice Māori values and to belittle those who struggle to protect the natural inheritance of future generations. Central and local government have systematically provided for the pollution of Ngāti Raukawa waterbodies, and failed to adequately provide for Māori values.'[1279]

6.12 Problems with the Crown's Regime for Freshwater Management

Having outlined above the poor and deteriorating state of fresh water in New Zealand, there are also features of the existing regime for managing freshwater resources that are contributing to water quality issues. The purpose of this section is to identify parts of the existing regime that need to be changed and, relatedly, things to avoid in any reforms.

6.12.1 Weak Limits in the NPS-FM

The first National Policy Statement for Freshwater Management (NPS-FM) was made in 2011, almost two decades after the RMA took effect. Amendments were made to the NPS-FM in 2014. In 2013-14 supporting guidelines – the National Objectives Framework (NOF) – were implemented. This framework is designed to provide limits and numbers with the specific goal of achieving the purposes of the NPS-FM.[1280]

The narrative of the NPS-FM raises ambitious expectations for maintaining or improving freshwater quality, but the numbers and limits prescribed in the NOF are insufficient to achieve them. Rather, they allow for still greater deterioration.[1281] Notably, most of the parameters previously used to measure the health of fresh waters are not included in the NOF.[1282] Thus, instead of supporting the NPS-FM to achieve its goals, the NOF, in practical terms, does the opposite, permitting further deterioration of our fresh water.[1283]

Some key issues arising from the current (2014) NPS-FM are: 1) many National Bottom Lines in the NOF are set lower than current water quality and will allow significant degradation of water quality and Ecosystem Health, Human Health, and other values; 2)

[1279] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

[1280] http://www.mfe.govt.nz/more/cabinet-papers-and-related-material-search/cabinet-papers/freshwater/fresh-start-fresh-water

[1281] http://www.sciencemediacentre.co.nz/2013/11/07/national-bottom-lines-for-freshwater-quality-experts-respond/

[1282] http://freshwater.science.org.nz/pdf/NZFSS_response_to_NPS-FM_July_2014.pdf

[1283] Sinner, J. 2011. The Implications of the National Policy on Freshwater Management. Cawthron Institute.

safety of rivers for cultural practices and contact with water are not supported by the NPS-FM or NOF; 3) protection of 'outstanding freshwater bodies', 'significant values' and 'overall water quality' will not provide for iwi and community values relevant to local waters (addressed in the 'Next Steps' section); and 4) There is a clear lack of connectivity across a number of areas in the NPS-FM that is inconsistent with a Māori worldview of water.

6.12.2 Bottom Lines Approach

The NOF framework applies a 'bottom line approach' to the management of ecosystem and human health values. In many cases the bottom lines are lower than current water quality in most rivers. An important example is the bottom line for nitrate toxicity (annual median 6900 milligrams per cubic metre and annual 95th percentile 9800 milligrams per cubic metre) which is several orders of magnitude greater than the median nitrate (N03N) concentration for almost all monitoring sites in New Zealand (Figure 51).

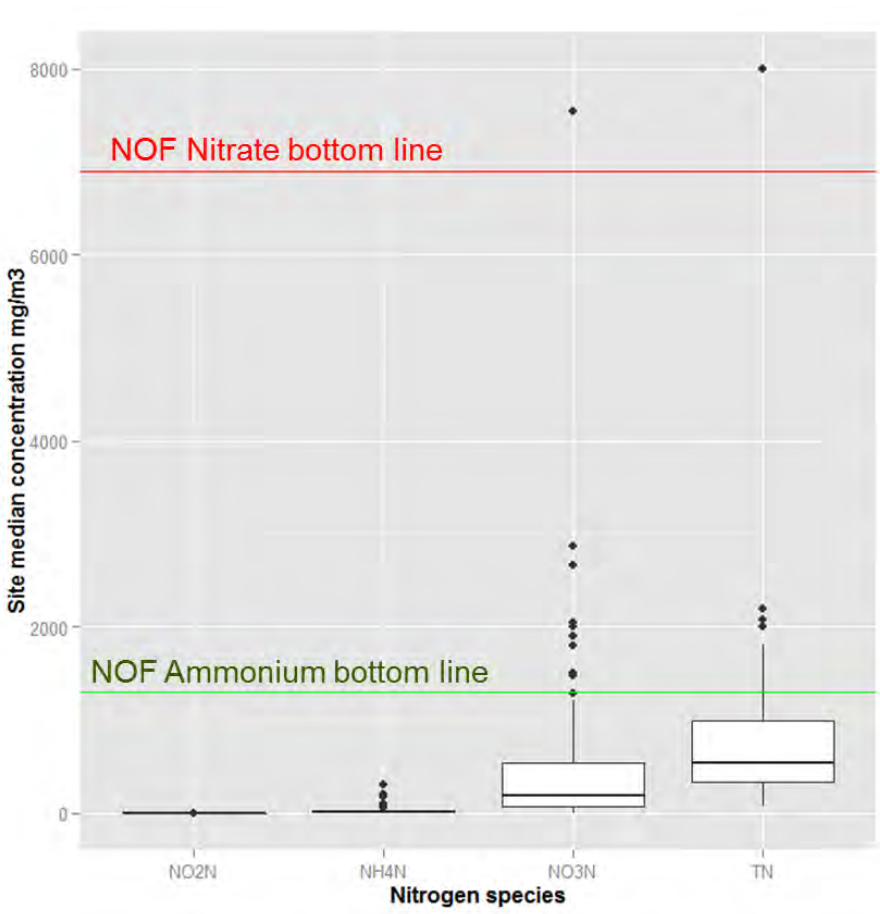


Figure 51: **Median nitrogen concentrations for various species at monitoring sites throughout New Zealand in relation to NOF ammonium and nitrate toxicity bottom lines.** ***Source: Presentation for Ministry for the Environment by Tom Snelder.***

For example, the Manawatū River had a median nitrate concentration of 0.51 mg/L and a maximum of 1.42 mg/L between July 2010 and March 2013, whereas the bottom line is 6.9 mg/L median and 9.8 mg/L 95th percentile. The usefulness of the bottom lines to manage significant water quality degradation is largely controlled by the 'maintain or improve' and 'overall' descriptions within the policies of the NPS-FM (see the discussion on maintenance within a band in the section below on 'Next Steps'). Many in regional councils and primary industries have set these bottom lines as mechanisms to create 'headroom for further contamination' as they are not set in relation to bottom lines for nitrogen that reflect ecosystem health (only direct toxicity and effects on growth and survival).

In addition, the bottom line for dissolved oxygen applies only to rivers below point-sources, rather than all fresh waters. Dissolved oxygen is critical for the survival of aquatic invertebrates and fish and is highly influenced by temperature, barometric pressure, salinity, and growth of nuisance plants and aquatic weeds. None of these factors are accounted for in the dissolved oxygen attribute table, as it is limited to point sources. The only meaningful way to measure dissolved oxygen is to sample continuously as in degraded systems it changes diurnally (see section 6.2.3 for example). Additionally, the attribute band descriptors in the NOF provide for circumstances where dissolved oxygen levels can cause losses of sensitive fish and macroinvertebrate species.

> 'The bottom lines suggested by the Crown do not include any measure of Māori values. There is an opportunity to include measures such as the Cultural Health Index.[1284] This is a continuation of creating poor policy that undermines the relationship Māori have with water.'[1285]

6.12.3 Attributes Missing from the NOF

The numeric attribute state for cyanobacteria (a potentially toxic algal growth) refers to both rivers and lakes but contains an attribute that is only relevant to lakes. Toxic algae are mentioned in the value state table but no numeric attribute states are provided for rivers. Benthic cyanobacteria is a significant concern for human and animal health in

[1284] Teirney, L. and Tipa, G. 2006. Using the Cultural Health Index: How to assess the health of streams and waterways.

[1285] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

rivers. National guidelines for benthic cyanobacteria risk in rivers have been in use since 2009,[1286] but have not been included in the NOF.

Barriers to native fish migration and other physical habitat limitations are also not mentioned within any of the NOF attributes. Barriers to migration are a critical impediment to maintaining the life-supporting capacity of many waterways and their ability to realise their full Ecosystem Health value and potential. Reference to native fish and their migration pathways is needed to be included as an attribute somewhere within the NOF. Possible links to the Freshwater Fisheries Regulations (with respect to barriers) requires investigation.

In addition, there are a number of key attributes for Ecosystem Health missing from the NOF parameters. Water temperature is critical to the survival, reproductive success, and distribution of aquatic species but is not included in the Ecosystem Health attributes. Enough is known about the effects of water temperature on organisms like aquatic macroinvertebrates,[1287] to use water temperature as an attribute in the NOF and recommendations for managing fresh water to achieve temperature attributes,[1288] particularly in upper catchment or small rivers with potential for shading through riparian management.

Dissolved oxygen is also critical for life and yet it is only present as an attribute where it relates to point-sources (see above). Ecosystem Health is dependent on critical attributes such as dissolved oxygen and water temperature.

Water clarity is integral for Ecosystem Health and Human Health values. In lakes, clarity determines whether submerged plants are able to grow and survive; reductions in lake clarity are therefore closely associated with loss of diversity and distribution of indigenous aquatic plants and the ecosystems they support. In rivers, clarity is closely associated with safe recreation, desirability for use, and suitability for fishing and boating

[1286] Wood, S. A., D. P. Hamilton, W. J. Paul, K. Safi, and W. M. Williamson. 2009. New Zealand Guidelines for Cyanobacteria in Recreational Fresh Waters – Interim Guidelines. Prepared for the Ministry for the Environment and the Ministry of Health Ministry for the Environment and Ministry of Health, Wellington.

[1287] Quinn, J. M., and C. W. Hickey. 1990. Magnitude of effects of substrate particle size, recent flooding, and catchment development on benthic invertebrates in 88 New Zealand rivers. New Zealand Journal of Marine and Freshwater Research 24:411-427.

[1288] Quinn, J. M., A. B. Cooper, R. J. Davies-Colley, J. C. Rutherford, and R. B. Williamson. 1997. Land use effects on habitat, water quality, periphyton, and benthic invertebrates in Waikato, New Zealand, hill-country steams. New Zealand Journal of Marine and Freshwater Research 31:579-597.

as well as ecological attributes. Poor clarity can affect the migration of native fish species, causing avoidance of some waterways and thereby loss of habitat, and the ability of fish to sight-feed on drifting invertebrates or smaller fish.[1289] Clarity-reducing sediment loads carried by rivers also have significant adverse impacts on estuaries, creating anoxic conditions through deposition of mud and providing substrate for the growth of nuisance macroalgae.

Closely associated with water clarity is the level of deposited sediment in rivers. Considerable regional and central government resource has been spent on the development of national guidelines for deposited sediment in rivers and yet these guidelines are not being utilised within the NOF.[1290]

Important bio-indicators of Ecosystem Health are also completely absent from the NOF. For example, the MCI is a well-accepted and nationally used bio-indicator of Ecosystem Health (see further the 'Next Steps' section below). Aquatic invertebrates integrate conditions over long time-scales, providing more information about river conditions than physical or chemical spot water quality measures. No indicators of the health of fish are included.

Periphyton cover is also an extremely important biological aspect of the health of rivers. Periphyton cover has been replaced by periphyton biomass, expressed by the surrogate biomass measure chlorophyll *a*. There are several disadvantages to using chlorophyll *a* in place of periphyton cover, including: 1) it is expensive and time consuming to monitor, requiring specialist sampling, transport, and laboratory costs (which reduces the ability of tangata whenua and others to affordably monitor their local rivers); 2) it is not a direct measure of the effect on values while per cent cover is; and 3) chlorophyll *a* can be affected by factors such as light/shading, temperature, and taxonomic composition of the periphyton.

[1289] Rowe, D. K., M. Hicks, and J. Richardson. 2000. Reduced abundance of banded kōkopu (Galaxias fasciatus) and other native fish in turbid rivers of the North Island New Zealand. New Zealand Journal of Marine and Freshwater Research 34:547-558.

[1290] Clapcott, J., R. G. Young, J. S. Harding, C. Matthaei, J. M. Quinn, and R. G. Death. 2011. Sediment Assessment Methods: Protocols and guidelines for assessing the effects of deposited fine sediment on in-stream values. . Cawthron Institute, Nelson, New Zealand.

A recent review of the instream plant and nutrient guidelines recommended a combined (and simpler) composite periphyton cover guideline known as PeriWCC.[1291] This guideline utilises weighted cover of filamentous and mat algae in one combined attribute with several levels of cover associated with ecological condition (general guidelines of <20 per cent, 20-39 per cent, 40-55 per cent and >55 per cent periphyton weighted composite cover are recommended as indicators of 'excellent', 'good', 'fair' and 'poor' ecological condition, respectively, at sites where other stressors are minimal), and aesthetic/recreation values (<30 per cent). Given this is the latest research in this area, on which significant regional and central government resources have been spent, it seems a waste to have developed a national level tool that isn't utilised through the NOF.

The NPS-FM allows 17 per cent exceedance of periphyton guidelines based on monthly samples over three years. This allowance effectively nullifies the use of periphyton as a measure of Ecosystem Health because as outlined above with reference to the Manawatū River, extreme oxygen fluctuations can occur. Usually this is only for a short period of time, commonly in late summer. The exceedances are based on 17 per cent of times over three years of monthly sampling, so six samples could exceed the bottom line and this would be classed as acceptable. This is despite the fact that late summer blooms that have been missed by the sampling regime could have had lethal effects.

Benthic cyanobacteria cover has been excluded from the Human Health attribute. The risks associated with toxic compounds from benthic cyanobacteria such as *Phormidium* is an increasing concern for Human Health and recreational river use. It should be included as an attribute.

Additionally, there are no Māori attributes included in the NOF. These need to be included, such as through a mahinga kai score or a Māori use score.[1292]

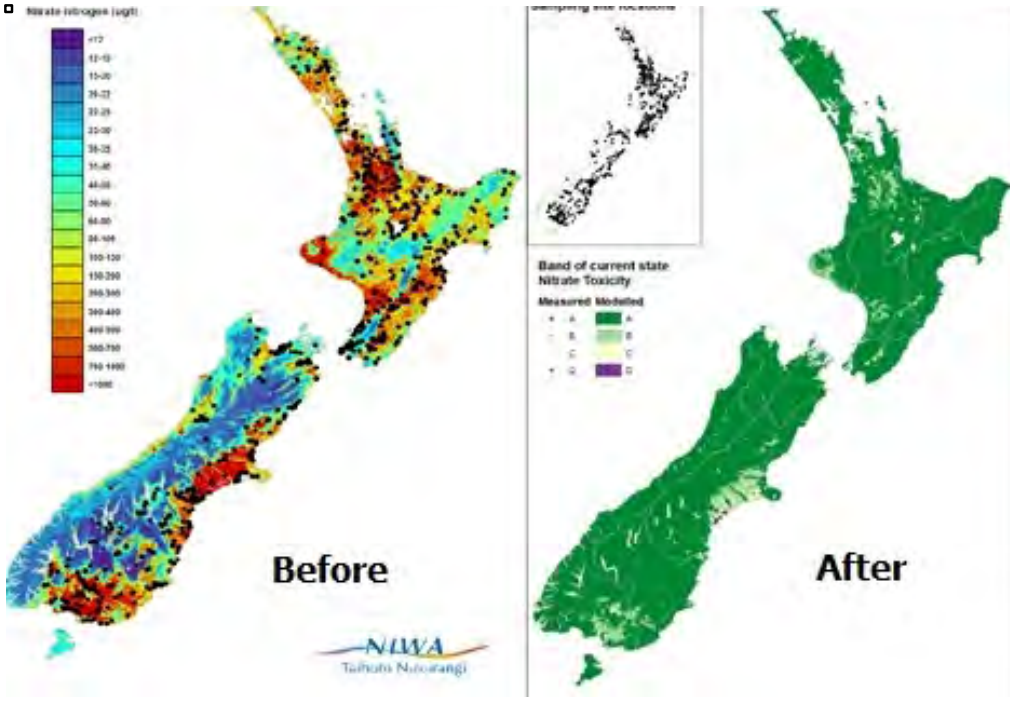
There is no direct reference to groundwater or aquifer systems and how to manage these with respect to the NOF attributes or of the connectedness to surface water. Similarly there is no mention of attributes specific to estuaries, a critical component of the Ecosystem Health of river catchments and the end point of our freshwater systems. Effects on estuaries from the NOF attributes applied to rivers should be a key

[1292] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

management consideration given the crucial role estuaries play in assimilating nutrients, sediment, and other contaminants; as pathways and nurseries for native fish; and as the interface between freshwater and coastal ecosystems. Often estuaries are in close proximity to major populated areas and are the main point of contact between people and water. For instance, estuaries are areas of significant use for recreational contact such as boating, fishing, and food gathering and are also linked to human health.

6.12.4 Attributes Inadequately Regulated by the NOF

The NOF sets limits for only one of the two critical nutrients – nitrogen – and problematically it allows for new nitrogen loads ten times greater than previous guidelines, extending even the limits currently used by many regional councils. Whereas the preceding and scientifically robust ANZECC guidelines allowed for levels up to 0.61mg/l, the new bottom-line is 6.9 mg/l.[1293] The NOF also implements new quality bands – A, B, C, and D (the last being a fail level). The inadequacy of these bands from a water quality perspective is demonstrated by the fact that less than 1 per cent of the rivers in New Zealand breach the bottom line reflected in the "D" band. This can be seen in the map below (Map 75).



Map 75: **Maps showing the weakening of nitrogen limits after the NPS-FM. The map on the left shows the actual nitrogen levels - all the red areas exceed the ANZECC limits. On the right**

[1293] http://www.environment.gov.au/water/publications/quality/australian-and-new-zealand-guidelines-fresh-marine-water-quality-volume-1.

after the limits were moved from ecosystem protection to toxicity almost every river in New Zealand meets the limit, the only exceptions being in South Canterbury.[1294]

Under the new limits in the NOF most New Zealand rivers, no matter how laden with nutrients, still score an A or B (<2.2 mg N/l).[1295] Yet more than 80 per cent of New Zealand's lowland pasture rivers already exceed ANZECC limits for *E. coli* and nutrients.[1296] Comparison with other countries shows just how weak the NOF limits are. Some of the world's most nutrient polluted rivers, for example the Yangtze and Mississippi,[1297] would score a B under the NPS-FM 2014 ranking. The Seine and the Thames would not breach the "D" band bottom line and would score a C grade. The sites on the Manawatū River where the oxygen variability was higher than 570 sites around the world would nevertheless score an A or B for nitrate-nitrogen.

The NOF also discounts the information provided by most of the health assessment criteria routinely used by regional councils, such as oxygen variability, temperature extremes, deposited sediment, and, crucially, well-developed biomonitoring tools such as the MCI and the fish IBI.[1298] Other omissions are any assessments of groundwater and estuary health and any scrutiny of benthic cyanobacteria, the toxic growth in polluted rivers that, as outlined above, has already killed dogs.

Protections and limits to safeguard human health from faecal contamination have also been significantly weakened under the NOF that supports the current NPS-FM. The existing safe measure for bathing – the Ministry of Health and ANZECC 'contact recreation' limit for pathogens – was replaced by a new measure called 'secondary contact' which increases the thresholds from 260 cfu/100ml to 1000 cfu/100ml, which in practical terms means that swimmers are no longer protected from waterborne health risks. 'Secondary contact' protects only people in boats or waders (Map 76).

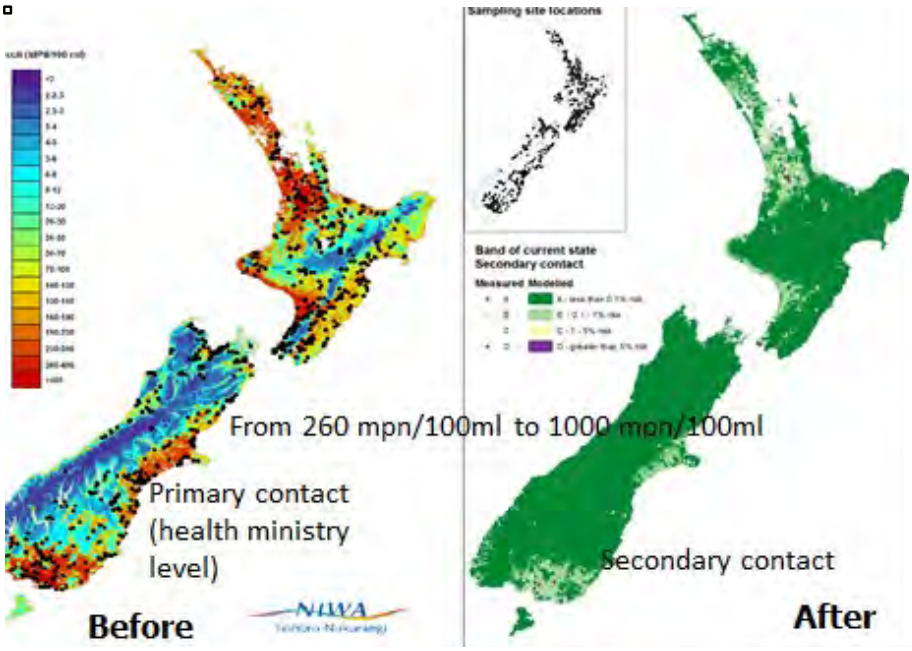
[1294] Unwin, M. J., and S. T. Larned. 2013b. Statistical Models, Indicators and Trend Analyses for Reporting National-scale River Water Quality) (NEMAR Phase 3). . NIWA, Wellington.

[1295] Ibid.

[1296] Larned, S. T., M. R. Scarsbrook, T. H. Snelder, and B. F. Biggs. 2004. Water Quality on Low-elevation streams and rivers of New Zealand recent state and trends in contrasting land cover classes. . New Zealand Journal of Marine and Freshwater Research 38:347-366.

[1297] Müller, B., M. Berg, Z. P. Yao, X. F. Zhang, D. Wang, and A. Pfluger. 2008. How polluted is the Yangtze river? Water quality downstream from the Three Gorges Dam. . Science of the Total Environment 402:232-247. Sprague, L. A., R. M. Hirsch, and B. T. Aulenbach. 2011. Nitrate in the Mississippi River and Its Tributaries, 1980 to 2008: Are We Making Progress? Environmental Science & Technology 45:7209-7216.

[1298] Joy, M.K. & Death, R.G.(2004). Application of the index of biotic integrity methodology to New Zealand freshwater fish communities. *Environmental Management* 34:415-428.



Map 76: **Maps showing the weakening of pathogen (*E. coli*) limits after the implementation of the NPS-FM. The map on the left shows the modelled current levels with all the red areas exceeding the primary contact limits from the ANZECC guidelines and the Ministry of Health. The map on the right shows the new limits and bands.[1299]**

As with nitrogen, these new human-health limits have been given quality bands: A, B, C, and fail. Most waterways now score an A or B. However, NIWA modelling shows that 62 per cent of the length of all rivers exceeds the Ministry of Health and ANZECC safe limit for swimming.[1300]

While it could be argued that the NPS-FM having limits for fresh water is an improvement over the situation prior when only 7 per cent of surface water catchments were subject to water quality limits,[1301] this is unlikely to be an improvement when the pre-existing ANZECC guidelines were far more comprehensive and in the case of nitrogen over 10 times lower (ANZECC Total Nitrogen limit 0.61 mg/l and NPS-FM bottom line 6.9 mg/l).

Nutrients enter waterways by a variety of paths, mostly either through the soil from urine (dairy cow urine patches), over the ground via storm-water and rainfall, or from wastewater treatment plant pipes. Water-quality protection has failed in large part because

[1299] Unwin, M. J., and S. T. Larned. 2013b. Statistical Models, Indicators and Trend Analyses for Reporting National-scale River Water Quality) (NEMAR Phase 3). . NIWA, Wellington.

[1300] NIWA (2011). Draft Regulatory Impact Statement: Proposed Amendments to the National Policy Statement for Freshwater Management. NIWA, Wellington.

[1301] Ministry for the Environment. 2015. Freshwater Programme: Managing within limits, pressures and opportunities. Ministry for the environment. p13, paras 8-9.

only one of those multiple pathways is controlled by regional councils through resource consents, and that one – out-of-pipe discharges – is generally the least of those evils. Milking-shed effluent constitutes at most just 20 per cent of the problem, because cows are only in the shed for a few hours a day. Similarly, industrial outfalls are typically only a minor component of total nutrient loads in rivers. Far more destructive is nitrogen overload via urine patches and phosphorus loads in sediment. But apart from a few rare exceptions, these have not been limited by consent or taxed in any way.

6.12.5 Compartmentalized Approach in the NOF

Finally, the NOF is problematic from an ecological perspective because of the compartmentalized nature of the limited range of attributes that are required to be managed through the NOF, which does not provide in any holistic sense for ecosystem or human health.

6.12.6 Nutrient Toxicity

If ecosystem health is to be restored or maintained, nutrients need to be managed to prevent excessive periphyton growth from suffocating invertebrates and fish. Nitrogen toxicity, the putative basis of the weakened nitrogen limits in the NOF, is in practical terms a non-issue because the ecosystem level effects of too much nitrogen mean that fish and other stream life are dead long before nutrient levels get to be toxic. As fish can't die twice, having a limit that protects them from toxic levels is pointless.

The toxicity levels were obtained experimentally by holding all other parameters like temperature and oxygen at a constant healthy level while adding nitrogen. This is an acceptable experimental process to find toxic limits, but is unrealistic because in real life, oxygen, temperature, and other life requirements all come into play long before any toxicity effects. Thus, toxicity would only be important in relation to point source discharges where nitrogen is in the form of ammonia, in a tank or lined pool where all other parameters were controlled or at sites with very little light reaching the bed of the stream.

The principal factors driving reduced freshwater ecosystem health in rivers and streams include: increased nutrient levels (leading to many secondary effects, described above), loss of riparian habitats, altered and reduced flows, and increased suspended and deposited sediment. Thus, ecosystem health and life supporting capacity should be the goal and focus of freshwater management objectives. Nitrogen toxicity limits do not in

any way achieve this goal. The only time the toxicity level and NOF bottom line for nitrogen (6.9 mgN/l) would be an issue over and above the ecosystem protection level (0.61 mgN/l) would be in deep dark streams receiving no light so that alga could not proliferate. But even then, excess nitrogen would be exported to downstream estuarine or coastal environments where it can contribute to marine eutrophication.

Recent reference by officials to NPS-FM and associated NOF toxicity levels as indicating that there is room or an opportunity for further agricultural intensification reveals a concerning lack of ecological understanding. As outlined above, ecosystem health is compromised at 0.61 mg total nitrogen per litre and the toxic limit is 6.9 mg/l. Thus, a documented assumption in a Ministry for the Environment paper that there is headroom for more pollution fundamentally undermines ecosystem health requirements, and would be very concerning, from an ecological perspective, if it came to be relied upon to justify further agricultural intensification.[1302] As noted above, the Manawatū River has nitrogen levels in the "A" band in the NOF but has ER and GPP levels so extreme they are double the next highest measured in world.[1303] Thus, the river at these monitored sites and likely at much more of the river not measured has dissolved oxygen in the early morning so low that most fish and invertebrates could not survive. Yet officials in the paper preferred to see an opportunity to have river nitrogen levels five times higher than that.

6.12.7 Problems with the Crown's Freshwater Reform Package[1304]

Proposed amendments 1.1 and 1.2 of 'Next Steps' relate to clarifying where and how 'maintain and improve overall' water quality will be applied. The proposal is to remove reference to water quality across a region and replace this with maintain or improve water quality within a Freshwater Management Unit (FMU). While this is a better option than assessing across a region, the approach still carries a risk that water quality will be allowed to degrade between rivers or within a catchment, depending on the manner in which maintain or improve is implemented and whether FMUs are defined in a consistent manner.

[1302] Ministry for the Environment. 2015. Freshwater Programme: Managing within limits, pressures and opportunities. . Ministry for the Environment, Wellington.
[1303] Young, R. No date. Ecosystem metabolism in the Manawatū River. Cawthron Institute.
[1304] Ministry for the Environment, *Next Steps for Fresh Water: Consultation Document* (Wellington: Ministry for the Environment, 2016).

There is no legitimate scientific method to trade off waterways to reach an 'overall' state of water quality.

The proposed amendment 1.2 of 'Next Steps' is intended to clarify what is meant by 'overall' water quality within the 'maintain or improve' objective for regions/FMUs. The ability to use trade-offs or to apply an 'unders and overs' approach to maintaining or improving water quality is still captured within this amendment. Given the state of fresh water and the declines in ecosystem health (particularly with respect to native fish communities) that have occurred under the watch of regional councils, it would be unwise to allow councils the level of 'flexibility' that is proposed in 'Next Steps'. Overall this proposal is unlikely to result in positive outcomes in the environment.

Another proposed option is to use the NOF band system to ensure water quality within an FMU does not significantly degrade. Such an approach would result in further significant declines in water quality, failure to maintain or improve water quality, and failure to maintain and enhance ecosystems. That is because for a number of the bands the difference between the upper and lower band boundaries can mean significant change in water quality, ecosystem health, and/or human health. For example, for ammonia toxicity a shift within the 'B' band from an annual median of 0.03mg/L to 0.24mg/L is a significant decline in median water quality and shifts the risk of impacts on sensitive species from 95 per cent protection to 80 per cent protection at the upper and lower bounds, respectively. Likewise, for nitrate toxicity a shift from low levels of nitrate up to 1mg/L (band A) constitutes a significant decline in water quality and would result in adverse effects on the ecological health of fresh water. These issues have been raised consistently by the New Zealand Freshwater Sciences Society in their submissions to government on the NPS-FM and amendments. Furthermore, and as outlined earlier, the notion of toxicity is only useful in relation to extreme wastewater treatment plant discharges.

The example used in the 'Next Steps' document is periphyton biomass. Comparing the 'B' band upper and lower bounds of 50 mg/m^2 and 120 mg/m^2 of chlorophyll *a*, movement within this band would result in significant declines in this attribute and likely commensurate impacts on the ecological health of the freshwater body. It is highly likely that macroinvertebrate communities at the extreme ends of these biomass values for 'B' band will be quite different, with equivalent changes in measured MCI score. The New

Zealand Periphyton Guidelines applied a threshold of 50mg/m^2 for maintaining aquatic biodiversity values and a threshold of 120mg/m^2 to support trout fishery and recreational values.[1305] There is certainly a distinguishable change in periphyton cover between rivers with slightly greater than 50mg/m^2 and rivers with 120mg/m^2 biomass both in aesthetic and recreational value terms, and in terms of ecosystem health within the macroinvertebrate community.

An additional complexity is added because aquatic stressors usually do not act in isolation from one another. The effect of allowing decline within the bounds of a band of one attribute, in combination with changes to other stressors (which may or may not be accounted for within the NOF attributes) may cause significant decline in values, including ecosystem health, while returning results that remain in the same attribute band.

Demonstrating maintenance of values that do not have defined attributes or bands within the NOF may be even more difficult. Ideally, attributes/limits would be applied to provide for the state of value that tangata whenua and others intend to maintain and these attributes/limits will be measureable over time, including through the use of mātauranga Māori and cultural monitoring tools. Monitoring attributes and/or limits within an FMU or at specific sites can be used to determine whether values are being maintained or improved. The need for resourcing of further work to develop mātauranga Māori-based monitoring tools has been identified by the Iwi Advisors Group for Freshwater, among others.

6.12.8 Ecosystem Health - Macroinvertebrate Community Index

Science supports the inclusion of the MCI (or QMCI) in the NPS-FM as a mandatory measure of ecosystem health. Variations of these indices have been applied consistently in wadeable, hard-bottomed streams for several decades and they are well-understood and well-researched tools for communicating the health of aquatic ecosystems. The use of a soft-bottomed MCI/QMCI variant adds to the range of streams and rivers that can be monitored and assessed using these metrics.

Biological and ecological indicators are essential attributes for the NOF if the NPS-FM is to provide for Ecosystem Health as a compulsory national value or if councils are to meet their section 30(1)(c)(iiia) RMA requirements to maintain ecosystems. The MCI or QMCI

[1305] http://www.mfe.govt.nz/publications/freshwater-publications/stream-periphyton-monitoring-manual

variant should be included as an attribute now within the NOF given it is the most highly used and well-researched macroinvertebrate measure in the country. The science does not support the view of MfE officials that the MCI does not lend itself for use as an attribute and there is no technical justification for this view.

However, it must be borne in mind that the quality of collection of invertebrate samples required for determining MCI scores can vary significantly, as can the sorting and analysis of the samples. The NPS-FM must include reference to a standard methodology for the collection and analysis of invertebrate samples. Any method chosen will need to be fit for purpose for a wide range of environmental conditions (in particular substrate size) and be as affordable as possible, while still collecting robust information. This would ensure consistency around New Zealand and allow samples throughout New Zealand to be collected and compared by government and non-government organisations alike.

> 'The MCI/QMCI are excellent tools for looking at ecosystem health but they do not necessarily represent the cultural health of waterways. Some water bodies can have a low score with the MCI but still sustain good mahinga kai. The QMCI is a better tool as it allows for an abundance measure. It is also worth noting that both the MCI and the QMCI have not been developed to represent Māori values so they are not representative of Māori perspectives of ecosystem health.'[1306]

6.12.9 Coastal Lakes and Lagoons

Proposal 1.6 in 'Next Steps', to include intermittently closing and opening lakes and lagoons in the lake provisions of the NOF is useful. These waterbodies are of significant biodiversity and value for tangata whenua. In many cases these waterbodies are degraded and require protection from further decline.

Clearer direction for councils is needed to allow for transitional objectives where bottom lines are already exceeded in these habitats.[1307] This continues to be an important consideration for the management of Te Waihora in Canterbury. Taking an intergenerational view, the lack of resource management options currently available to

[1306] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

[1307] See, Ministry for the Environment, *Next Steps for Fresh Water: Consultation Document* (Wellington: Ministry for the Environment, 2016).

deal with legacy land use change and pollution effects, such as those degrading Te Waihora and other coastal lakes and lagoons, should not allow waterbodies to be 'written off'. Ideally, councils would be directed to ensure management under the NPS-FM includes a trajectory of continuous improvement in water quality (through management of contaminants from land or discharges) and aquatic habitat.

6.12.10 Stock Exclusion from Waterways

The adverse effects of stock on aquatic habitat and water quality are well recognised in resource management and in the scientific literature. Proposals to exclude stock are needed to manage the nutrient and faecal contamination of water. However, there is a risk that the current proposal outlined in 'Next Steps' will be difficult to implement and enforce. It would be clearer if stock on all dairy support blocks were excluded from 2020. This would also bring forward the environmental benefits of dairy stock exclusion. In addition, applying stock exclusion only to properties with a slope less than fifteen degrees is likely to result in similar implementation and enforcement issues and may not effectively manage the contaminants at the wider catchment scale.

The application of the stock exclusion regulation only to drains and streams that are wider than one metre and deeper than 30 centimetres is inconsistent with the ecological importance of these habitats. Small streams and intermittently-flowing streams are often the most important areas for key ecosystem functions and aquatic biodiversity. Small streams and/or intermittently-flowing streams provide critical habitat for a range of native fish, including many threatened species. They often have lower flushing capacity, are subject to pasture and weed encroachment, and are less resilient to stock damage. Sedimentation (caused by erosion from stock trampling) and encroachment of pasture and weeds cause major losses in stream width in rural streams thus reducing viable gravel habitat for fish and invertebrates.[1308]

Nationally, 74 per cent of New Zealand's native fish taxa are at risk or threatened with extinction.[1309] This proportion has risen considerably since work to classify species

[1308] Davies-Colley, R. J. 1997. Stream channels are narrower in pasture than in forest. New Zealand Journal of Marine and Freshwater Research 31:599-608.

[1309] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

threats began in New Zealand.[1310] It is clear that the manner in which resource management of fresh water and the coastal interface are being undertaken is failing to sustainably manage the environment to avoid adverse effects on native fish. The basic purpose of the Resource Management Act is not being fulfilled.

6.12.11 Mātauranga Māori and Māori Freshwater Science

Mātauranga Māori monitoring tools such as the Cultural Health Index already exist. Further development of mātauranga Māori and Māori freshwater science needs resourcing and support. Many freshwater practitioners have a strong interest in aligning western science with mātauranga Māori to improve freshwater outcomes for tangata whenua. This is not raised as a subject of any of the detailed proposals in 'Next Steps'.

6.13 Concluding Remarks

As detailed in this chapter, it is clear from the analysis and description of freshwater quality (both state and trends), that the Crown has comprehensively failed to protect the health of inland waterways in the inquiry district. This failure is systemic and has had a major impact on their life-supporting capacity and thus their use by hapū and iwi as a key source of food, fibre, and medicine; as the basis of their economy; and as sites for spiritual cleansing and rejuvenation.

The implementation of the relatively recent Resource Management Act 1991, or lack of it, has not halted the degradation. If anything, it appears to be contributing to it, as under the Resource Management Act, significant impacts on water quality in New Zealand through sedimentation, and diffuse nutrient and pathogen pollution are being ignored. Ignoring these impacts, the majority of which result from agricultural intensification in particular, has allowed increased degradation of lowland lakes and rivers, as well as many aquifers, estuaries, and harbours.

The freshwater management approaches taken to date by the Crown have patently failed to protect ecosystem health and fish habitat. Over time the failure has led to local species extinction and unless significant changes are made and made soon, it is apparent from the trajectories of decline that we will have more species on the threatened list. The current NPS-FM and NOF are not backed up by meaningful water quality limits, and in most

[1310] Molloy, J., B. Bell, M. Clout, P. J. De Lange, G. Gibbs, G. Given, D. D. Norton, N. Smith, and T. Stephens. 2002. Classifying species according to threat of extinction. A system for New Zealand. Department of Conservation, Wellington.

cases the bottom lines they set are much weaker than the guidelines they replace. This problem is in turn exacerbated by the fact that under the current NPS-FM and NOF the wrong things are in many cases measured the wrong way. For example, many of the important components or indicators of ecosystem health are not included, and others like dissolved oxygen are measured as one-off when it is diurnal variability that is crucial. Furthermore, the fact that the regional councils are not required to fully implement the NPS-FM until 2030 means that there will be no potential for any net improvement in water quality for many years, at best.

In this environment, lowland lake ecosystems in New Zealand have already passed ecological tipping points. In 2010, for instance, 44 per cent of monitored lakes had become eutrophic or worse, meaning they have tipped into another trophic state due to excess nutrients and sediment.[1311] Estuaries and harbours at the end of catchments are under severe pressure with ocean fish nursery areas such as eel grass beds lost from most New Zealand harbours and estuaries, in turn having major impacts on ocean fisheries.[1312] Riverine ecosystems in lowland reaches in intensive pasture catchments regularly pass tipping points with sediment and nutrient impacts, although some reaches are ecologically reset when flood flows flush out sediment and periphyton.

Tipping points are hard to predict but it is clear that many lakes and harbours in New Zealand have passed the point of no return, at least for decades or longer. Rivers are relatively easier to pull back from tipping but given the lag times for sediment and nutrient impacts, all else being equal, many rivers can be expected to decline for decades to come. Given the lag times for nutrients and sediment from past land use change and intensification of farming in the last few decades, it is likely that freshwater ecosystems will continue to decline and more will tip into a worse state. The effects of all of this degradation on aquifers and groundwater are more difficult to know at this point, due to difficulties in scientifically measuring, but it is not likely to be positive.

[1311] Verburg, P., K. Hamill, M. Unwin, and J. Abell. 2010. Lake Water Quality in New Zealand 2010: Status and Trends. Ministry for the Environment.

[1312] Morrison, M. A., M. Lowe, D. Parson, N. Usmar, and I. McLeod. 2008. A review of land-based effects on coastal fisheries and supporting biodiversity in New Zealand. Report, NIWA, Auckland.

7. FISHERIES AND WETLANDS

7.1 Introduction

The inland waterways and wetlands in the inquiry district were clearly a vital resource for Māori: freshwater fish, waterfowl, and water-plants were food, fibre, and rongoā. Human settlement patterns and seasonal movements were based around these waterways, especially the extensive wetlands which made up 34 per cent of the inquiry district before European colonisation. However, with subsequent drainage and conversion to pasture, the wetland area is now just less than one per cent.

The draining of these wetlands has had profound impacts on the value of this landscape to claimant hapū and iwi in many ways, as detailed in this report. It was undoubtedly seen by the colonists as a very worthwhile task to make the landscape suitable for farming, however, our current knowledge shows that process was retrograde step. The late world renowned freshwater ecologist and environmental historian Robert McDowall summed up the destruction of wetlands, saying:

> '…although for Māori they were priceless assets – rich, self-renewing sources of food and fibre, to Pākehā they were something useless to turn into excellent farmland.'[1313]

Wetlands are traditional mahinga kai, or resource gathering areas. Early Māori harvested harakeke (NZ flax; *Phormium tenax*) for clothing, mats, kete (baskets), and rope; kuta (bamboo spike sedge; *Eleocharis spacelata*) for weaving and insulation; raupō (*Typha orientalis*) for thatching and dried moss for bedding; and mānuka (*Leptospermum scoparium*) for poles and palisades; as well as culturally important plants for use as rongoa.[1314] Wetlands provide habitat for eels (*Anguilla spp.*), and habitat and breeding grounds for īnanga, banded and giant kōkopu (*Galaxiid* spp.); common, Crans, and Upland bullies (*Gobiomorphus* spp.); as well as abundant birdlife. Thus to Māori, wetlands were endlessly self-sufficient suppliers of food, pharmacy, and fibre.

[1313] RM McDowall, *Ikawai: Freshwater Fishes in Māori Culture and Economy* (Christchurch: Canterbury University Press, 2011), p 597.
[1314] B Clarkson, AG Ausseil, and P Gerbeaux, 'Wetland Ecosystem Services', in *Ecosystem Services in New Zealand : Conditions and Trends*, edited by J Dymond (Palmerston North: Landcare, 2014).

Robert McDowall comprehensively detailed how European colonisation of New Zealand led to significant losses in freshwater assets and fisheries.[1315] The worst cases were where Māori were driven completely from their tribal lands, through to the impacts of colonisation which included land sales and land use change like wetland drainage, as well as the impact of introduced freshwater species. McDowall summarised the losses in this list:

- Loss of actual habitat;
- Deterioration in habitat quality, often of a rather more general nature, sometimes incidental to other activities;
- Deprivation of access to habitat – Māori have long complained about loss of access to some fisheries by private ownership of land and threats of action for trespass;
- Exclusion from actual fisheries sometimes caused by the passage of new laws; losses due to exploitation of other resources, such as forests, by Pākehā.; and
- Governmental or private development schemes on rivers and lakes (e.g. dam construction, water abstraction).[1316]

Historian Alan Ward summed up the situation clearly:

> 'The loss of Māori of their waterways has been very heavy – heavier in some respects than the loss of land. These rights are of the utmost importance to a people whose existence was as much bound up with water as with the land, and the loss of customary rights, with little or no negotiation or compensating except in respect of major lakes, does not sit well with treaty obligations.'[1317]

As the land was taken up by Pākehā settlers and turned into farms, access to many waterways for Māori was gradually lost and thus many traditional fishing areas became inaccessible.

Wetlands were compulsorily acquired by the Crown and, where deemed necessary, were then stop-banked, drained, and turned into farms – a huge gain for Pākehā but a huge loss

[1315] RM McDowall, *Ikawai: Freshwater Fishes in Māori Culture and Economy* (Christchurch: Canterbury University Press, 2011), p 548.
[1316] Ibid.
[1317] A Ward, *National Overview* (Wellington: Waitangi Tribunal, 1997), p 367.

for Māori.[1318] All sorts of statutes, including the Native Land Act 1973 and a series of Public Works Acts 1876, 1882, and 1908, all culminating in the Swamp Drainage Act 1915, left Māori with virtually no rights over these wetlands and waterways.[1319] The Crown could take whatever land it wanted without redress from Māori owners, and as a result, more than 90 per cent of all New Zealand wetlands have been drained.[1320]

According to ecologist Geoff Park, by the 1960s:

> 'Crown drainage operations had eliminated the indigenous fauna and flora of a great many of New Zealand's lowland swamps.'[1321]

What happened to the wetlands of the inquiry district exemplifies what happened nationally and Park went on to say that:

> '… swamps were undoubtable customary taonga … the Crown's actions in swamp drainage were consistently against the Māori interest and represented a major abrogation of the Treaty guarantee to Māori.'[1322]

The development of drained wetlands into farms added value to the farms, leading to economic gains and that led to more demand for wetlands to be drained. The marginal areas of lakes and existing wetlands became popular for grazing and there were demands that these marginal lands not be inundated as water tables rose or river mouths were blocked. Adkin, when talking about Lake Papaitonga, said:

> 'The practice in recent years by adjoining European landowners has been to persuade the Māori owners of the lakes and streams to permit lowering of water levels. This had for its objective the drainage of contiguous swamp-lands to increase the pasturage for livestock … This has been detrimental to the lakes themselves. Their size has been diminished, their margins altered and made less favourable as eel feeding places, and a greatly augmented rate in the silting up of the lake basins has resulted. Is it not possible that a dear-bought bid for progress

[1318] RM McDowall, *Ikawai: Freshwater Fishes in Māori Culture and Economy* (Christchurch: Canterbury University Press, 2011).
[1319] Ibid.
[1320] B Clarkson, AG Ausseil, and P Gerbeaux, 'Wetland Ecosystem Services', in *Ecosystem Services in New Zealand : Conditions and Trends*, edited by J Dymond (Palmerston North: Landcare, 2014).
[1321] G Park, *Nga Uruora – The Groves of Life: Ecology and History in a New Zealand Landscape* (Wellington: Victoria University Press, 1995), p 39.
[1322] Ibid, p 673.

has been made in the accelerated obliteration of the beautiful, natural, moisture-conserving water-features of our landscape?'[1323]

Concomitant with drainage and intensification and spread of farming and urbanisation was a decline in the standard of water quality, covered in detail in Chapter 6. Adkin wrote of a friend describing Lake Horowhenua as a lake of:

> 'Surprising beauty…largely surrounded by virgin forest.… many beautiful lagoons, with clean-cut margins bounded by grassy slopes or copses of verdure that completed a landscape of unspoilt charm.'[1324]

This description is hard to reconcile with what is seen today, after decades of sewage discharge into the lake from Levin township and high nutrient run-off from horticulture and pastoral farming in the catchment.

Another impact on waterways and fisheries were the river developments to control flooding and drainage. Many lowland waterways are stop-banked and the tributary streams therefore have flap-gates on them. These flap-gates, as well as culverts and weirs, have many impacts on fish passage.[1325] This loss of free upstream and downstream passage is a major issue for freshwater fish in New Zealand because of the predominance of migratory species in the fauna.[1326]

The failure of the Crown to protect freshwaters is starkly revealed by New Zealand's freshwater biodiversity statistics. Some of the worst statistics are for the 54 native freshwater fish species: the number under threat has greatly increased in the past 20 years from about 20 per cent in the early 1990s to 74 per cent today. Freshwater crayfish and New Zealand's only freshwater mussel are also listed as threatened with extinction.[1327] As fish are near the top of food webs they are crucial indicators of the state of freshwaters

[1323] GL Adkin, *Horowhenua: Its Māori Place Names and Their Topographic and Historical Background* (Wellington: Department of Internal Affairs, 1948), p 24.
[1324] Ibid, p 18.
[1325] James A, Joy MK 2008. A preliminary assessment of potential barriers to fish migration in the Manawatū River catchment, North Island, New Zealand. Massey University. 437-HZLC45. 137 p. James A, Joy MK 2009. Prioritisation for restoration of out-flow stream habitat of coastal wetlands on the West Coast of the Manawatū-Wanganui River. Horizons Regional Council.
[1326] Joy MK, Henderson IM, Death RG 2000. Diadromy and longitudinal patterns of upstream penetration of freshwater fish in Taranaki, New Zealand. New Zealand Journal of Marine and Freshwater Research 34: 531-543.
[1327] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

and habitats. There are many components of the Crown failure described in this report and in more detail in two recent book chapters; the 'Freshwaters of New Zealand' chapter in *Austral Ark; the State of Wildlife in Australia and New Zealand*,[1328] and the chapter 'Freshwater Biodiversity' in *Ecosystem Services in New Zealand*.[1329]

These two chapters describe the dire state of freshwater biodiversity in New Zealand and the drivers of the declines. The reveal how New Zealand's freshwater systems; rivers, lakes, groundwater and wetlands are all suffering immense ecological impacts. Almost all lowland waterways in the North Island and on the east-coast of the South Island are significantly or severely impacted. These declining freshwater ecosystems are all impacted by the usual drivers implicated globally in freshwater degradation; vegetation clearance, damming of rivers, invasive fish introductions, agricultural run-off, urban and industrial wastewater discharges and over-allocation of water abstraction rights. The single best indicator of the extent of degradation waterways have suffered in NZ is the shocking reality that three-quarters of native fish taxa are listed as threatened or at risk. To see clearly what the contemporary riverine freshwater quality and ecosystem health issues are maps of water quality in NZ released by NIWA and others that reveal that the declines are all associated with intensive farming dominated catchments. The analysis clearly shows that native freshwater communities are more impacted and that fish diversity is declining much faster in intensively farmed catchments.

7.2 Ecosystem Loss

Indigenous biodiversity has been greatly reduced throughout the lower North Island. This loss is reflected in the increasingly fragmented and degraded nature of the remaining bush remnants and wetland habitats, and absence of species that were once common. Prior to the arrival of humans, the lower North Island was almost completely covered (98 per cent cover) in indigenous vegetation, dominated by extensive forest.[1330] For the Manawatū district, 94.27 per cent of the vegetation was removed by 2000, and for the Horowhenua

[1328] Joy, M. K. 2015. Freshwaters in New Zealand. Pages 227 - 239 in A. Stow, N. Maclean, and G. Holwell, editors. Austral Ark; The State of Wildlife in Australia and New Zealand. Cambridge University Press, Cambridge.

[1329] Joy, M. K., and R. G. Death. 2013. Freshwater Biodiversity. Page 448 in J. R. Dymond, editor. Ecosystem Services In New Zealand. MANAAKI WHENUA PRESS, Lincoln New Zealand.

[1330] Ewers RM, Kliskey AD, Walker S, Rutledge D, Harding JS, Didham RK 2006. Past and future trajectories of forest loss in New Zealand. Biological Conservation 133: 312-325.

district, 80.98 per cent was destroyed.[1331] All vegetation/habitat types have been impacted, but the most altered are those in the lowlands. Most of the podocarp forests have been lost but the wetland forest types, including kahikatea and pukatea forests, have been virtually decimated (Figure 52).[1332]

Catherine Knight detailed the history of ecosystem loss in the Manawatū in her book *Ravaged Beauty* and highlighted the importance of wetlands for all their values.[1333] The book contains many examples of the importance of wetlands to Māori and the impacts on them of drainage and engineering works on the Manawatū River.

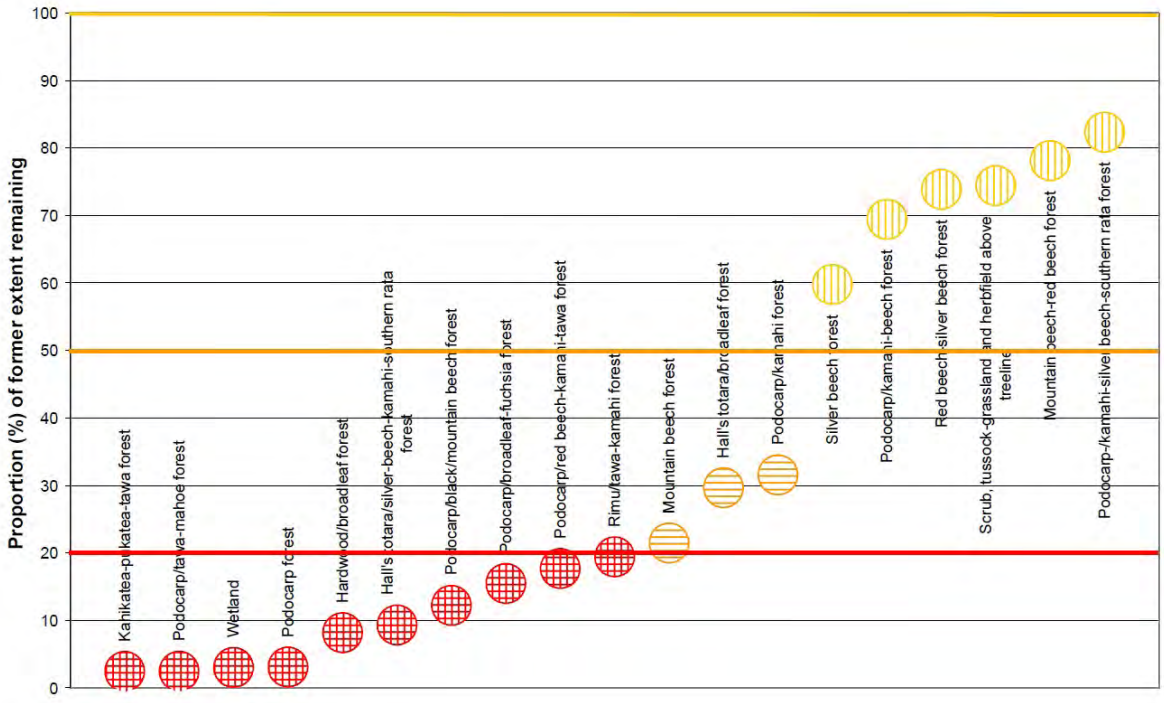


Figure 52: **Habitat types identified in the Manawatū-Whanganui Region and remaining extent of each habitat type as proportion of previous extent. Habitat types below the red line are considered threatened, and below the orange line are 'at risk'.**[1334]

[1331] Ibid.
[1332] Maseyk F 2007. Past and current indigenous vegetation cover and the justification for the protection of terrestrial biodiversity within the Manawatū-Whanganui Region. Horizons.
[1333] C Knight, *Ravaged Beauty: An Environmental History of the Manawatū* (Wellington: Dunmore Press, 2014).
[1334] Maseyk F 2007. Past and current indigenous vegetation cover and the justification for the protection of terrestrial biodiversity within the Manawatū-Whanganui Region. Horizons.

7.3 Wetlands

7.3.1 What are Wetlands?

Wetlands have been defined as the transitional lands between terrestrial and aquatic systems where there is an oversupply of water for all or part of the year.[1335] In the Resource Management Act 1991, the definition is similar to those from the rest of the world as: "permanently or intermittently wet areas, shallow water, and land and water margins that support a natural ecosystem of plants and animals adapted to wet conditions".

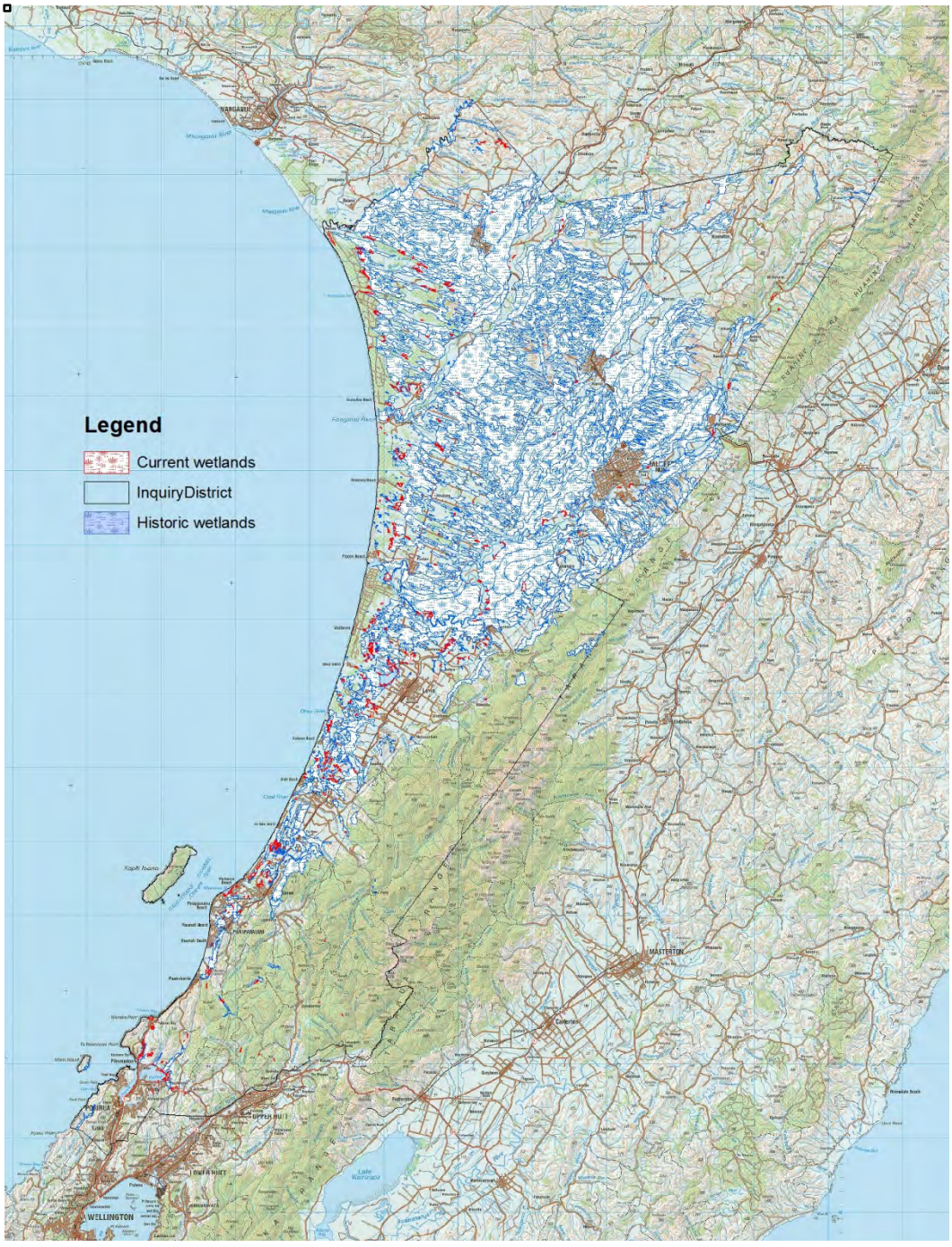
The drainage and destruction of wetlands in the south-western North Island has been a huge loss of value. Of all the worlds' ecosystems, wetlands are among the most productive and thus the most valuable. Before European colonisation, wetlands made up a substantial proportion of the inquiry district. Within the area, more than 88 per cent of wetlands have been lost since European colonisation with total wetland coverage dropping from approximately 172,000 ha to just less than 2000 ha today (Map 77). The losses were mainly the wetland type known as swamp, but also most of the bogs, fens, and marshes; the only type to increase were seepages (Table 9).

Table 9: **Change in hectares for wetlands in the inquiry district since European colonisation.[1336]**

	Bog	**Fen**	**Marsh**	**Seepage**	**Swamp**	**Total Wetland**
Historic area (ha)	503	197	6,175	0.30	165,458	172,335
Current area (ha)	3	25	453	22.33	1,454	1,958
Total loss (ha)	-499	-172	-5,722	+22	-164,004	-170,376

[1335] Clarkson BR, Ausseil AGE, Gerbeaux P 2013. Wetland ecosystem services. Dymond JR ed.

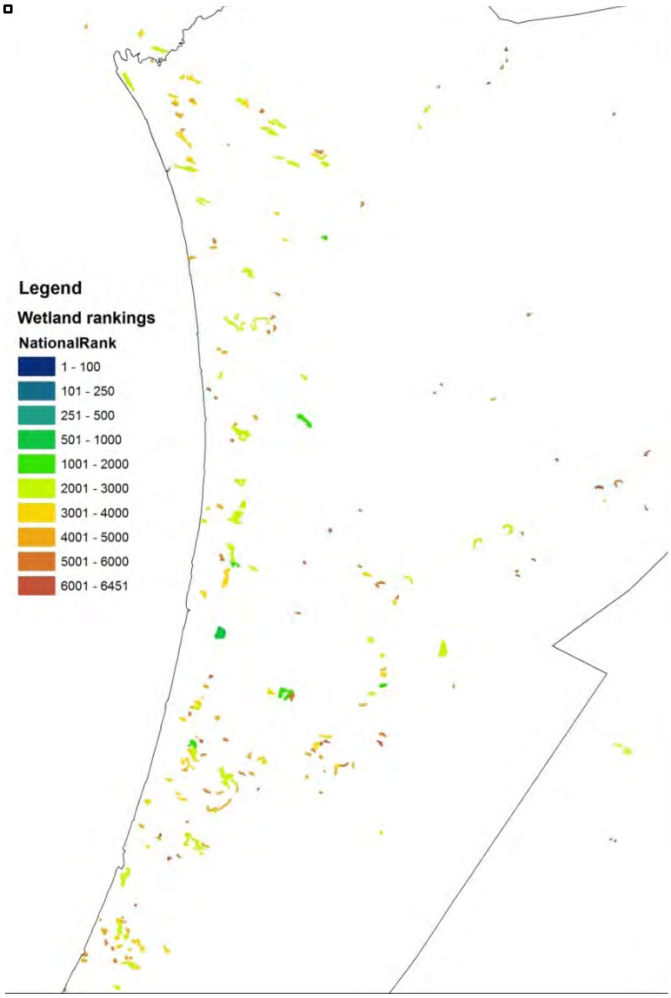
[1336] Calculated from GIS layers in, Leathwick J, West D, Chadderton WL et al. 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE. Department of Conservation, Research & Development Division, Hamilton.



Map 77: **Historic and current wetland extent in the inquiry district; data from Freshwater Environments of New Zealand (FENZ).**[1337]

The tiny proportion of wetlands remaining are generally in poor condition and fragmented in comparison to wetlands nationally,[1338] as can be seen in the national wetland ranking in Map 78.

[1337] Leathwick J, West D, Chadderton WL et al. 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE. Department of Conservation, Research & Development Division, Hamilton.



Map 78: **Wetland condition score in the lower North Island and in the inquiry district.**[1339]

7.3.2 The Value of Wetlands

Wetlands are particularly important because they provide high-value ecosystem services, such as acting as pathways, recipients, sources, and sinks of biotic and abiotic resources.[1340] What this means functionally is that, situated at lower parts of catchments, they receive water, sediments, and nutrients from upslope and process them. The combination of abundant nutrients and shallow water promotes vegetative growth that takes up nutrients and purifies water; in doing so they make habitat available to a wide range of fish, birds, and invertebrates.

[1338] Ausseil AGE, Gerbeaux P, Chadderton WL, Stephens T, Brown D, Leathwick JR 2008. Wetland ecosystems of national importance for biodiversity: Criteria, methods and candidate list of nationally important inland wetlands. . Landcare Research Contract Report.

[1339] Leathwick J, West D, Chadderton WL et al. 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE. . Department of Conservation, Research & Development Division, Hamilton.

[1340] Zedler JB, Kercher S 2005. Wetland resources: Status, trends, ecosystem services, and restorability. Annual Review of Environment and Resources pp 39-74.

Wetlands provide a wide array of benefits: economic, social, environmental, and cultural; these have been dubbed 'ecosystem services'[1341]. These 'services' are the things that are valuable to humans, including: maintaining or improving water quality and a stable supply of water; regulating activities like sequestering carbon; sustaining indigenous biology (plants and animals, both aquatic and terrestrial); and providing many cultural, recreational, and educational resources.

7.3.3 The Monetary Value of Wetlands

Wetlands are crucial components of local and global water cycles and are fundamental to the connections between water, food, and energy cycles. In a recent book, *The Economics of Ecosystems and Biodiversity (TEEB) for Water and Wetlands*[1342], the authors calculated dollar values for a selection of ecosystems and wetlands came out at a staggering figure of approximately US$44,000 per hectare per year. This is among the highest value of all ecosystems studied by the TEEB authors and this value is one important measure of what has been lost in the inquiry district.

In New Zealand relatively few wetland ecosystem valuations have been published, but the functions and processes in New Zealand wetlands have been shown to be similar to those found in northern hemisphere wetlands[1343]. One example of a New Zealand national valuation of wetland ecosystem services was recently published by Bev Clarkson, Anne-Gael Ausseil and Phillippe Gerbeaux. This study was the first of its kind and revealed the huge loss of wetlands and their services for the whole country.[1344] This paper revealed that the more than 90 per cent of wetlands that have been lost nationally since European arrival is one of the highest rates in the developed world.

[1341] Costanza, R., R. D'Arge, R. de Groots, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. V. O'Neill, J. Paruelo, R. G. Raskin, P. Sutton, and M. van den Belt. 1997. The value of the world's ecosystem services and natural capital. Nature 387:253-260.

[1342] TEEB 2013. The Economics of Ecosystems and Biodiversity (TEEB) for Water and Wetlands. London & Brussles, Ramsar Secretariat.

[1343] Clarkson B, Aussiel A-G, Gerbeaux P 2014. Wetland Ecosystem Services. In: Dymond J ed. Ecosystem Services in New Zealand : Conditions and Trends. Palmerston North, Landcare; Clarkson BR, Schipper LA 2005. New Zealand Journal of Botany 43: 365-365; Clarkson BR, Ausseil AGE, Gerbeaux P 2013. Wetland ecosystem services. Dymond JR ed. 192-202 p; Myers SC, Clarkson BR, Reeves PN, Clarkson BD 2013. Wetland management in New Zealand: Are current approaches and policies sustaining wetland ecosystems in agricultural landscapes? Ecological Engineering 56: 107-120.

[1344] Clarkson B, Aussiel A-G, Gerbeaux P 2014. Wetland Ecosystem Services. In: Dymond J ed. Ecosystem Services in New Zealand : Conditions and Trends. Palmerston North, Landcare

7.3.4 Monetary Value of Lost Wetland Ecosystems in the Inquiry District

Ecosystem services can be valued by calculating what it would cost if you had to pay to get these services. Based on three different estimations on the monetary value of wetlands, the value of historic losses of swamp wetlands in the inquiry district has been calculated and presented in Table 10.

Table 10: **Loss of ecosystem services value in dollars due to wetland loss in the inquiry district (swamp only).**

	$NZ 43,320/ha/yr (Van den Belt 2009[1345]	**$US44,597.00 ha/yr (Maximum global value TEEB 2013)[1346]**	**$NZ52,530 ha/yr (Patterson and Cole 2013)[1347]**
Historic area	$7,167,676,420	$7,378,967,343	$8,691,552,224
Current area	$62,989,745	$64,846,576	$76,381,609
Value of lost ES $	-$7,104,686,674	-$7,314,120,767	-$8,615,170,614

Within the ecosystem valuations there are different categories: provisioning, regulating, habitat, and cultural. Values are broken into these categories for the inquiry district in Table 11.

[1345] van den Belt M, Chrystall C, Patterson M 2009. Rapid ecosystem service assessment for the Manawatū-Whanganui region, New Zealand Centre for Ecological Economics.

[1346] TEEB 2013. The Economics of Ecosystems and Biodiversity (TEEB) for Water and Wetlands. London & Brussles, Ramsar Secretariat.

[1347] Patterson M, Cole A 1999. Assessing the values of New Zealand's biodiversity. Report prepared for Environment Waikato. Massey University, Palmerston North.

Table 11: **Monetary valuation of services provided by wetlands per hectare per year for the relative importance of services, and for the total amount of wetlands lost in the inquiry district.**

	Max global value (Int$2007) TEEB 2013[1348]	Proportion of total	Value of ES in the inquiry district (Table 2)
Total	$44,597	1.00	$7,378,967,343
Provisioning	**$9,709**	**0.22**	**$1,546,727,423**
Food	$2,090	0.05	$332,955,022
Freshwater supply	$5,189	0.12	$826,652,446
Raw materials	$2,430	0.05	$387,119,954
Genetic resources	-	-	
Medicinal resources	-	-	
Ornamental	-	-	
Regulating	**$23,018**	**0.52**	**$3,666,965,891**
Influence on air quality			
Climate regulation	$351	0.01	$55,917,326
Moderation of extreme events	$4,430	0.10	$705,737,201
Regulation of flows	$9,369	0.21	$1,492,562,492
Waste treatment	$4,280	0.10	$681,840,907
Erosion prevention	-	-	
Maintenance of soil fertility	$4,588	0.10	$730,907,963
Pollination	-	-	
Biological control	-	-	
Habitat	**$3,471**	**0.08**	**$552,960,231**
Life cycle maintenance	$917	0.02	$146,086,007
Gene pool protection	$2,554	0.06	$406,874,223
Cultural	**$8,399**	**0.19**	**$1,338,033,127**
Aesthetic	$3,906	0.09	$622,259,482
Recreation/tourism	$3,700	0.08	$589,441,906
Inspiration	$793	0.02	$126,331,738
Spiritual experience	-	-	
Cognitive information	-	-	

[1348] TEEB 2013. The Economics of Ecosystems and Biodiversity (TEEB) for Water and Wetlands. London & Brussles, Ramsar Secretariat.

7.4 What was Lost – Fisheries

There is no way to accurately quantify the distribution and abundance of freshwater species before European colonisation of New Zealand, but historical accounts give us a picture of immeasurable abundance. For example, John Featon wrote:

> '[that] perhaps no … tribes that ever existed … had such an abundance of the good things of this world' as early Māori.'[1349]

Another historian, Gordon Lewthwaite, wrote of the abundance of freshwater life:

> 'Aotearoa offered a wealth of freshwater fish that greatly surpassed anything the islands cold offer … satisfying the Māori zest for fat and facilitating the spread of riverine settlement.'[1350]

He went on:

> 'the now-vanished grayling (*Prototroctes oxyrhynchus*) … and variety of whitebait … were available to add savour and reconcile the fishermen to the eel-less waters of Taupō and upper mountain streams.'[1351]

James Belich stated:

> 'The inland waters provided eels and freshwater crayfish and mussels, and a dozen species freshwater fish such as kōkopu or "native trout', grayling, whitebait and lamprey.'[1352]

Elsdon Best noted that at least by the time of European colonisation:

> 'The Māori was assuredly a very expert fisherman; long-continued practise made him so; hence it rendered him expert in the manufacture of fish implements, and gave him knowledge of the habits and movements of many species of fish.'[1353]

[1349] Featon J 1863. The Waikato Wars 1863-64, Auckland, Capper press reprint 1971, p 20.
[1350] Leathwaite RG 1965. Land and society in New Zealand; Essays in historical geography R.F. W ed. Wellington, Reed, p 20.
[1351] Ibid.
[1352] Belich J 1996. Making people: A history of the New Zealanders from Polynesian settlement to the end of the nineteenth century. Auckland, Allen Lane/Penguin, p 68.
[1353] Best E 1929. Fishing methods and devices of the Māori. Dominion Museum Bulletin 12: 1 – 231, p 199.

A report on Māori freshwater fisheries for the Department of Conservation stated that during the Muriwhenua and Ngai Tahu fisheries claims to the Waitangi Tribunal, there was a wealth of information within Māori and academic worlds on traditional fisheries. This included historical accounts, ethnographic information, and accounts of iwi themselves. These provide detailed information on the nature and extent of traditional Māori fisheries.[1354]

McDowall noted that neither the government nor Te Ohu Kai Moana (TOKM, the Treaty of Waitangi Fisheries Commission) had addressed the issues of Māori interests in freshwater fisheries, although TOKM had established and funded the Te Wai Māori Trust to begin to deal with them. McDowall then stated that he hoped his book *Ikawai* (published after his death in 2011) would help achieve that aim.[1355]

7.5 What was Lost – Freshwater Biology and Fisheries: Tuna (Eel)

Tuna were crucial to life for Māori as they were a constant and readily available source of protein.[1356] Furthermore, tuna provided vitamins, fatty acids, and higher calorie content than kumara and other root species that made up the traditional Māori diet.[1357] This importance also led to tuna becoming culturally important to Māori.[1358] The capture and management of tuna was an important part the yearly food gathering cycle.

The two main species of tuna in New Zealand are the native shortfin (*Anguilla australis*) and the endemic longfin (*Anguilla dieffenbachia*); and there has also been a third tuna species arrival in the last few decades: the Australian longfin (*Anguilla reinhardtii).*[1359]

7.5.1 Tuna Lore

Tuna hold a special place as a character within Maoridom. For example, tuna occur in accounts of Maui separating the tuna deity creating the source of both freshwater and

[1354] IKA C 1994. Report on Māori Customary Fishing Rights for the Department of Conservation. IKA consultants, Auckland.
[1355] McDowall RM 2011. *Ikawai: Freshwater fishes in Māori culture and economy*. Christchurch, Canterbury University Press.
[1356] Paulin CD 2007. Perspectives of Māori Fishing history and techniques. Ngā āhua me ngā purākau me na hangarau ika te Māori. Tuninga; Records of the Museum of New Zealand Te Papa Tongarewa 18: 11 - 47.
[1357] Leach BF 2006. Fishing in pre-European New Zealand. New Zealand Journal of Archaeology Special Publication and Archaeofauna 15: 1 - 359.
[1358] Marshall Y 1987. Māori mass capture of freshwater eels: an ethnoarchaeological reconstruction of prehistoric subsistence and behaviour. New Zealand Journal of Archaeology 9: 55-79.
[1359] Jellyman DJ, Chisnall BL, Dijkstra LH, Boubee JAT 1996. First record of the Australian longfinned eel, Anguilla reinhardtii, in New Zealand. Marine and Freshwater Research 47: 1037-1040.

saltwater tuna. They are also considered a gift from the heavens when the waterways dried up and fresh water and salt water were split with the different species of tuna. Tuna in a physical manifestation can be found in a variety of forms, such as kaitiaki, for example tuna touro representing a bad omen, or as a warning, attacking humans as a taniwha in the representation of giant eels protecting a stretch of river.[1360] These tuna are considered representations of ātua, and continue to be revered and cared for by Māori.[1361]

For Māori, there were strict rules around the process of making traps and nets as well as the taking of tuna. These kaitiakitanga practices were managed in accordance with tikanga under the guidance of tōhunga, with men, women, and children having different roles in fishing and preparation of food.[1362] At different times of the year tōhunga had particular karakia to recognise Tangaroa (the deity of fish) to ensure fishers were successful.

Freshwater ecologists, Don Jellyman and Robert McDowall, have described the in-depth and intimate knowledge of the life cycles and habits of tuna that Māori have developed.[1363] Māori traditional knowledge led to a management regime that included a variety of techniques for tuna harvesting, including through the use of a combination of traps, spearing, bait fishing, and large weirs.[1364]

7.5.2 Habitat Loss for Tuna

On top of the loss of habitat through drained wetlands, research by NIWA has revealed that around half of longfin habitat has been lost to longfin tuna due to migratory barriers, principally hydro dams and other barriers. Of an estimated total of 12,000 tonnes of tuna biomass, 6000 tonnes is lost because of dams removing the access to habitat.[1365]

Longfin tuna migrate extensively inland, thus they have been negatively impacted by the installation of physical barriers to migration – upstream for elvers and downstream for mature adults. The barriers are many weirs and dams. The Crown has made no legislative

[1360] Downes TW 1918. Notes on eels and eels weirs. Proceedings of the Royal Society of New Zealand 50.
[1361] Paulin CD 2007. Perspectives of Māori Fishing history and techniques. Ngā āhua me ngā purākau me na hangarau ika te Māori. Tuninga; Records of the Museum of New Zealand Te Papa Tongarewa 18: 11 - 47.
[1362] Best E 1929. Fishing methods and devices of the Māori. Dominion Museum Bulletin 12: 1 - 231.
[1363] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press.
[1364] Downes TW 1918. Notes on eels and eels weirs. Proceedings of the Royal Society of New Zealand 50.
[1365] Graynoth E, Jellyman D, Bonnet ML 2007. Spawning escapement of female longfin eels.

provision for upstream or downstream passage of tuna because reduced abundance or exclusion upstream was deemed to be favourable to recreational fisheries based on imported brown and rainbow trout. The result of this has been extensive exclusion of tuna from upstream habitats. For example, a series of eight hydro-electric dams on the Waikato River effectively excluded tuna from 30 per cent of this catchment. Likewise, installations of major hydro-schemes on large South Island rivers (Waiau, Clutha, and Waitaki) collectively impacted upstream recruitment to more than 20 per cent of the whole of the South Island.

As well as this removal of habitat, there are extensive irrigation and other farm draining pumping systems in some regions, and intakes are often unscreened and result in the unreported deaths of tuna. Less than 10 per cent of national longfin stocks are in DOC reserves,[1366] and only seven per cent of total longfin stocks are in waters protected from commercial exploitation.[1367]

7.5.3 Habitat Loss for Tuna in the Inquiry District

In the inquiry district there has been a major loss of eel habitat through physical and water-quality impacts. Using various estimates of tuna densities and the loss of wetlands, estimates of the biomass of tuna lost is shown in Table 12. The estimates range from a loss of 9,000 to 183,000 tonnes. The reasons for the large variation are many, including the variability of habitat and densities of tuna within any wetland, as well as sampling and other effects. The high density estimates come from Pukepuke wetland lakes in the 1970s which appear to be ideal tuna habitat;[1368] thus, this may not be representative of the pre-colonisation habitat in the inquiry district. The lower contemporary estimates come from lowland rivers only and were estimated by NIWA and DOC scientists.[1369]

[1366] Graynoth E, Niven K 2004. Habitat for female longfinned eels in the West Coast and Southland, New Zealand.

[1367] Doole GJ 2005. Optimal management of the New Zealand longfin eel *(Anguilla dieffenbachia).* Australian Journal of Agricultural and Resource Economics 49: 395-411.

[1368] Skrzynski W 1974. Review of biological knowledge of New Zealand Freshwater Eels (Anguilla spp.) New Zealand Ministry of agriculuture and fisheries, Wellington New Zealand.

[1369] Graynoth, E., and K. Niven. 2004. Habitat for female longfinned eels in the West Coast and Southland, New Zealand. Department of Conservation.*www.doc.govt.nz/documents/science-and-technical/SfC238.pdf*

Table 12: **Estimated loss of eel biomass in the inquiry district through wetland drainage**

Estimated change in eel biomass (kg) at a point in time in the inquiry district since European arrival			
Estimated eel biomass	**@ 1120kg/ha (Skrzynski 1974)[1370]**	**@ 438kg/ha (Caithiness 1973)[1371]**	**@ 60kg/ha (Graynoth et al. 2004a)[1372]**
Total historic	185,313,887.13	72,470,966.58	9,927,529.67
Total current	1,628,543.74	636,876.93	87,243.41
Total loss (kg)	-183,685,343	-71,834,089	-9,840,286

7.5.4 Traditional Capture of Tuna

Pa tuna or eel weirs are v-shaped structures to funnel or direct fish where they can be netted or stored by cutting off the return to river. Such structures are not confined only to New Zealand, for example similar structures are found in Ireland, Sweden, and Japan.

7.5.5 Traditional Harvest of Tuna in the Inquiry District

Peterson reported that the smaller settlements scattered over Manawatū Forest and plains were located in the vicinity of favoured sources of food, Awahuri and Taonui for tuna, and Hokowhitu for tuna found in the river lagoons.[1373] Another historian writing about the Horowhenua district, Ewart O'Donnell, thought that:

> 'No one writing of the food supply of Māori can afford to overlook the important part played by the tuna of eel … The existence of a swamp of lake which provided a constant source of supply of what to him was one of his chief delicacies constituted in a large measure his standard of the desirability of a locality.'[1374]

New Zealand's pre-eminent freshwater biologist and fisheries historian, Robert McDowall, stated that as far as he was able to determine:

[1370] Skrzynski W 1974. Review of biological knowledge of New Zealand Freshwater Eels (Anguilla spp.) New Zealand Ministry of agriculture and fisheries, Wellington New Zealand. 37 p.

[1371] Caithiness TA 1973. Research at Pukepuke. Wildlife – a review 4: 49-51. . Wildlife Service, Dept. of Internal Affairs. Wellington

[1372] Graynoth, E., and K. Niven. 2004. Habitat for female longfinned eels in the West Coast and Southland, New Zealand. Department of Conservation.w*ww.doc.govt.nz/documents/science-and-technical/SfC238.pdf*

[1373] Peterson GC 1973. Palmerston North; A centennial history. Wellington, Reed.

[1374] RA McDonald and E O'Donnell, *Te Hekenga: Early Days in Horowhenua* (Palmerston North: GH Bennett & Co Ltd, 1929), p 45.

> ‘The Horowhenua was the area of the greatest concentration of whakamate (eel channels) [in New Zealand], possibly because of its very large areas of wetlands, but also owing to a lack of large rivers.’[1375]

McDowall concluded that Adkin’s account revealed that the Horowhenua area right through to Whanganui in the north was one of the most productive and intensively fished tuna resources known to Māori.[1376] Adkin alluded to the area from Ōtaki to Whanganui as:

> ‘…famed for its natural food resources, especially for its eel supply … “The fisheries were highly favoured by their owners and coveted by the tribes of less favourable territories … the water courses teemed with eels [which] were taken in vast numbers. In Horowhenua the lakes and lagoons and many of the streams and water courses teemed with eels, of which there were at least two species and many local varieties. The sorts of favoured foods were taken in vast numbers in due season, either for immediate use or for drying and storing for future consumption. Storage alive in artificial ponds or tanks was also practised.’[1377]

Ecologist Geoff Park also discussed the immense traditional importance of inland waterways to Horowhenua. In his treatise on New Zealand’s lowland forest ecosystems, he stated that:

> ‘The Horowhenua’s vast swamps of harakeke and eels were the mainstay of mana, and the central attractions to the Waikato people who overran them. Māori fished for flounder, kākahi, whitebait, and eels in Lake Horowhenua and its associated swamps and streams – especially the Hōkio.’[1378]

Not only was fish an important part of the local Māori diet, it was also dried and traded and Adkin showed that Muaūpoko engaged in tuna husbandry.[1379]

[1375] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press, p 195.
[1376] Ibid.
[1377] Adkin GL 1948. Horowhenua: its Māori place names and their topographic and historical background. Department of Internal Affairs, Wellington, p 19.
[1378] Park G 1995. Nga Uruora – The Groves of Life: Ecology and History in a New Zealand Landscape. Wellington, Victoria University Press, p 572.
[1379] Adkin GL 1948. Horowhenua: its Māori place names and their topographic and historical background. Department of Internal Affairs, Wellington.

The Horowhenua region has had a relatively recent and meticulous description of tuna weirs by Adkin (23 weir sites) and their associated whānau and whakapapa of each site.[1380] Adkin identified tuna weirs or pā tuna consistent with earlier records; he described the construction of kouma, 1 – 12 canals between the 23 recorded lagoons. The largest canals he described were substantial, being up to 100 metres long, 5 metres wide, and 2 metres deep, tapering to shallow ends where eels could be trapped. Adkin wrote of the tuna weirs on the Hōkio stream and noted the 'rau-matangi' which he described as a:

> '…sharply zig-zagged fence of stakes driven vertically and wattled with mānuka brush, and hīnaki were placed at openings at each of the angles.'[1381]

The Horowhenua pā tuna comprised permanent v-shaped structures, holding pots, and hīnaki areas at sites on streams that demarcated access for whānau. These structures had carved symbols depicting the users' whānau or whakapapa, and thus the pā tuna were also places that recorded a historical right of ownership of the stream and its resources.

7.5.6 Pā Tuna History

Tuna fishing has taken many forms according to tribal tradition, season, location, and habitat. Past fishing methods included koumu (eel trenches), hīnaki (eel pots), pa-tuna (eel weirs), toi (eel-bobbing without hooks), korapa (hand netting), rapu tuna (feeling with hands and feet and catching in hands), rama tuna (using torch light), patu tuna (eel striking), and mata rau (eel spearing). Details on the techniques and structures were provided by early ethnologists like Downes,[1382] and Best.[1383]

Elsdon Best gives details of the Māori classification system for different ages and life stages of tuna and localised differences in taste associated with them. He described the cultural practices and traditions associated, like karakia, with different fishing methods. He also highlighted the in-depth written and oral traditional knowledge held in relation to the different species, and the amounts taken based on seasonal variations and lunar cycles. Best also described the intricate symbolism on equipment associated with the pā

[1380] Ibid.
[1381] Ibid, p 19.
[1382] Downes TW 1918. Notes on eels and eels weirs. Proceedings of the Royal Society of New Zealand 50.
[1383] Best E 1929. Fishing methods and devices of the Māori. Dominion Museum Bulletin 12: 1-231.

tuna, representing and recognising different aspects of ātua and their realms where the fish inhabit.[1384]

Downes and Best both described the technological developments made over time in the construction of nets, their patterns, shapes, and framing. They also described how fish were farmed by being removed from traps and transported to other holding nets, fed, and used at a later date.

7.6 The Status of Tuna Fisheries in New Zealand

The decline of the longfin tuna in New Zealand is further evidence of the failure of the Crown to protect freshwaters and fisheries. The failure is two-fold: allowing the degradation of waterways, and allowing the commercial fishing of a declining species.

Longfin tuna are New Zealand's largest native freshwater fish, and historically tuna dominated the biomass of all waterways often constituting 90 per cent of the total stream fish biomass.[1385] With this loss of significant numbers of large longfins, there is now concern about the resulting ecological impacts on lower trophic levels.[1386]

The National Institute of Water and Atmospheric Research (NIWA) undertake research into New Zealand tuna species. The leading eel researcher at NIWA, Don Jellyman, has for a long time been concerned about the risk of extinction for longfin tuna due to habitat loss and over exploitation.[1387] Under New Zealand's threat classification system, the longfin tuna was classed as declining,[1388] and yet they make up 35 to 40 per cent of the commercial harvest. In 2004, estimates suggested that the annual recruitment of longfin tuna had declined by 75 per cent since the 1970s.[1389] Jellyman has made it clear that despite the Quota Management System (QMS), the current fishery is not sustainable:

[1384] Ibid.

[1385] Hicks BJ, Glova GJ, Duncan MJ 2004. Forestry interactions—New Zealand. . In: T. G. Northcote aGFH ed. Fishes and Forestry. Worldwide Watershed Interactions and Management, Blackwell.

[1386] Jellyman DJ 2007. Status of New Zealand fresh-water eel stocks and management initiatives. Ices Journal of Marine Science 64: 1379-1386.

[1387] Ibid.

[1388] Goodman JM, Dunn NR, Ravenscroft PJ et al. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1389] Doole GJ 2005. Optimal management of the New Zealand longfin eel (Anguilla dieffenbachii). Australian Journal of Agricultural and Resource Economics 49: 395-411.

> ‘Despite the additional gazetting of reserve areas, it is considered unlikely that such measures will be sufficient to arrest a predicted substantial decline in recruitment of this species.’[1390]

Another effect of the commercial fishery is that because female longfin tuna are larger they are preferentially taken by commercial fishers, thus an unnaturally high proportion of male tuna remain. This is evidenced in regularly commercially fished rivers where highly skewed sex ratios are found, for example in the Aparima River a study sample of around 500 tuna showed a > 90 per cent male bias.[1391] Obviously this ratio would have serious implications for breeding success.

7.6.1 Legislative Failure to Protect Tuna

Tuna as native fish fall under the responsibility of the Department of Conservation through the Conservation Act 1987, Part 2, Section (ab):

> ‘to preserve so far as is practicable all indigenous freshwater fisheries, and protect recreational freshwater fisheries and freshwater habitats.’

This protection, or no protection, is further complicated by the fact that tuna are managed under the Ministry for Primary Industries Quota Management System (QMS) under the Fisheries Act 1996, as commercially viable species. The Freshwater Fisheries Act 1983 protects native fish in Section 70, but then immediately negates this protection in section 71 where it states:

> ‘Nothing in regulation 70 shall be construed as a restriction on the taking of whitebait, or eels, or other indigenous fish for the purposes of scientific research or for purposes of human consumption.’

7.6.2 Tuna Migration Barrier Mitigation Efforts

Several decades ago, tuna were regarded as nuisance species, but with the Resource Management Act 1991 councils are now theoretically required to protect tuna. This has led to hydro-electric dam operators being required to provide access past barriers, and these are mostly in form of ‘trap and transfer’ systems to facilitate elver migration

[1390] Jellyman DJ 2007. Status of New Zealand fresh-water eel stocks and management initiatives. Ices Journal of Marine Science 64: 1379-1386, p 1384.

[1391] McCleave JD, Jellyman DJ 2004. Male dominance in the New Zealand longfin eel population of a New Zealand river: Probable causes and implications for management. North American Journal of Fisheries Management 24: 490-505.

upstream. Recent counts show that there are around 3-5 million elvers transferred using trap and transfer at large dams in New Zealand.[1392] However, there is little or no assessment as to whether this number transferred is actually sufficient to maintain sustainable populations upstream. Furthermore, to put these numbers into perspective, a single large longfin female can produce around 7.6 million eggs,[1393] so the total transfers at all New Zealand dams is half the number of elvers potentially produced by a single female longfin tuna. A further example of the insignificance of the 3-5 million elvers transferred annually in the whole of New Zealand is a record from the Waikato River of a shoal of elvers 5 metres wide, and 2-3 metres deep which continued upstream past the reporters' point of observation for more than 8 hours.[1394]

7.7 Acclimatisation Societies

During the most active time of the Acclimatisation Societies, there was little regard for indigenous species and essentially no understanding of the pending destructive impact of the exotic species on an island biota that had essentially evolved in isolation for 80 million years. Early legislation was rapidly gazetted (New Zealand Animal Protection Act 1867) to give the introduced species the best chance of establishing widely throughout New Zealand.

Between 1850 and 1922, it is estimated from Acclimatisation Society records that over 800 exotic species were introduced to New Zealand, with 51 of the vertebrate species (mammals, birds, fish, and reptiles) becoming pests.[1395] The majority of these early introduced species were protected by strict regulations under the New Zealand Animal Protection Act 1867.

The early Pākehā colonists in the mid-19th century wanted to turn New Zealand into the 'Great Britain of the South'.[1396] They were very successful; introducing a multitude of exotic species of plants and animals. Acclimatisation societies were set up as early as the

[1392] Jellyman DJ 2012. The status of longfin eels in New Zealand - an overview of stocks and harvest; Prepared for Parliamentary Commissioner for the Environment. Wellington

[1393] Todd PR 1981. Timing and periodicity of migrating New Zealand freshwater eels (Anguilla spp.). New Zealand Journal of Marine and Freshwater Research 15: 225-235

[1394] Cairns 1941 cited in McDowall RM 1978 New Zealand Freshwater fishes: a guide and natural history Heinemann.

[1395] Seabrook-Davison, M.N.H., Ji, W., Brunton, D.H., 2010. New Zealand lacks comprehensive threatened species legislation — comparison with legislation in Australia and the USA. Pacific Conservation Biology, Vol. 16: 54–65.

[1396] Hursthouse C 1857. New Zealand or Zealandia: The Britain of the south. London, Stanford.

1860s to establish populations of animals from the home countries. High on their list of species for introduction were trout and salmon. In 1867, the Trout and Salmon Act was passed, and trout introductions were one of the first activities of acclimatisation societies.[1397]

While the acclimatisation societies were privately-run organisations, they had a close relationship with the Crown throughout their history, often being referred to in legislation. Indeed, the Salmon and Trout Act became the basis of the Fisheries Act 1908. This included regulation of fisheries with closed seasons and fisheries, available only to those who paid for a licence.

These introductions created a fundamental dichotomy between Māori and Pākehā because Māori wanted access to their traditional fishing resources, whereas Pākehā commentators found little of no value in New Zealand's rivers, and wanted to rid them of abundant and, to them, huge eels.

Iwi and hapū members continue to be concerned that Crown agencies historically focused on the protection of introduced fish species such as trout over that of native fish species for example kōkopu (native trout species).[1398] It was not until recently that the Crown turned to consider the protection of these species, with indigenous species singled out for special treatment in legislation such as the Resource Management Act 1991.

7.8 Māori Fishing Rights

7.8.1 Crown Failure to Protect Māori Fishing Rights

Māori fishing rights were said to be protected by section 77 (2) of the Fisheries Act 1908 (in force until 1983). However, Section 77 was placed within Part 1 of the Act which related to sea fisheries. The Fisheries Protection Act 1887 stated in Section 8:

> "Nothing in this Act shall be deemed to repeal, alter or in affect any of the provisions of the Treaty of Waitangi, or to take away or annul, or abridge any of the rights of the aboriginal natives to any fishery secured to them thereunder."

[1397] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press.

[1398] Personal communication, Iwi Participant at the Feilding CFRT Hui for this Draft Report, 30 June 2017.

Thus, this legislation applied only to tidal areas of rivers and there was no comparable provision in Part 2 of the Act relating to freshwaters.

The Fisheries Act 1908 was finally updated in 1983 and is the current legislation. The Conservation Law Reform Act 1990 also added a freshwater section to the Conservation Act of 1987. The Department of Conservation's responsibilities and administrative roles for freshwater fisheries are described in Part 5B of the 1987 Act. The Act states that it shall not affect Māori fishing rights, but neither pieces of legislation define Māori statutory fishing rights.

In his book *Ikawai*, Robert McDowall referred to the Fisheries Protection Act 1877 Section 8 quoted above saying that:

> 'That seems fairly explicit! However, this provision did not deal with the issues of access to fishing waters, nor did protect Māori fisheries from deteriorating habitat or habitat loss (e.g. wetland drainage), from impacts of alien fisheries (e.g. trout), or from over exploitation. It was almost as if Māori were welcome to their fisheries if they could get to them and should there be anything left of value.'[1399]

Article 2 of the Treaty of Waitangi affirmed for Māori their:

> '…full exclusive and undisturbed possession of their lands and estates, forests, fisheries … as long as their wish and desire to retain the same in their possession.'

As McDowall noted:

> 'Despite apparent assurances in the Treaty of Waitangi that Māori would retain possession of their fisheries (among other natural resources) for as long as they wished … many Māori groups have argued that this promise has not been kept by the Crown. In some instances, the loss that Māori have sustained could not have been predicted as some have been indirect effects, incidental to other actions resulting from Pākehā colonisation. But there have clearly been some major losses for Māori that anyone could have predicted, and about some of these various Māori individuals or groups complained before the event, both informally and officially, and have done so time and time again since. These complaints have

[1399] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press, p 745.

> often been ignored, rejected or overruled. The losses sustained have been so pervasive, widespread and intense that it is difficult to know quite where to start.'[1400]

Freshwater fisheries were of little interest to the Crown prior to the 1960s when a commercial eel market developed in Europe. In a short time eel nets and traps were set in rivers all over New Zealand. This commercial fishery resulted in Crown intervention and they placed the fishery under a Quota Management System (QMS) in 2004. The QMS is administered by the Ministry of Primary Industries under the Fisheries Act 1996.

Most of the inquiry district is under the quota management areas LFE22 for longfin tuna and SFE 22 for shortfin tuna. The total allowable catch is 21 tonnes for longfin tuna of which 6 tonnes is customary and 5 is recreational, and 94 tonnes for shortfin tuna of which 14 tonnes is customary and 9 recreational. The data in Table 13 shows the commercial catch, but it is important to note that no figures are available for customary or recreational catch because the data is not collected. The shortfin tuna quota was exceeded in 2011, and the longfin tuna TACC (total allowable commercial catch) of 21 tonnes was never reached. In 2015, the catch was only half of the TACC. This suggests that the longfin harvest is declining, supported by data revealed by the Parliamentary Commissioner for the Environment,[1401] and the ranking of longfin tuna as threatened and in decline[1402].

Table 13: **Table 1. Commercial catch record for LFE 22 and SFE 22 from the Ministry for Primary Industries (MPI) NZ webpage for the period from 1 October 2010. Data accessed 27/10/2016 from fisheries InfoSite: www.fish.govt.nz**

Year	Longfin eel (kg)	Shortfin eel (kg)
2011	5,705	58,828
2012	18,567	95,664
2013	15,048	81,959
2014	14,700	82,145
2015	11,977	73,317

[1400] Ibid, pp 586-587.
[1401] Parliamentary Commissioner for the Environment 2013. On a pathway to extinction? An investigation into the status and management of the longfin eel. Wellington
[1402] Goodman JM, Dunn NR, Ravenscroft PJ et al. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

7.8.2 Crown Failure to Protect Whitebait

The juveniles of five New Zealand native fish species are known as whitebait, and their capture is a popular commercial and recreational fishery managed by the Department of Conservation (DOC). The five species are: īnanga, kōaro, banded kōkopu, giant kōkopu, and shortjaw kōkopu. However, four of the five species (all except banded kōkopu) are currently classified by DOC as 'at risk' or 'threatened' with extinction. The fishery management from DOC seems to be almost non-existent. Apart from a seasonal control there is no control on fishing intensity and no catch records are kept. This failure to protect the fishery is obvious with the threatened or at risk status of four of the five species that make up the fishery. This is an obvious failure of the Crown.

Te Waari Carkeek of Ngāti Raukawa, Ngāti Huia, and Ngāti Toa Rangatira has written that:

> 'Īnanga as a resource have been exploited through carelessness and selfishness and regulations that have intravened on Māori fishing rights as far back as 1894 … we used to catch them by the bucket fill …. [The reduction is] directly related to the destruction and reclamation of the extensive wet lands that this coast was once well known for. If we look closely at our coast today, it is no wonder catches have been depleted.'[1403]

7.9 Freshwater Fish Distribution in the Inquiry District

To give a picture of the current distribution of freshwater fish species in the inquiry district, predictive maps have been used. These maps fill in the gaps between sample sites to give a picture of where fish are and aren't now. The predictive maps were first developed in New Zealand in 2004 and the modelling process uses information from many thousands of sites nationally to give very testable representations of the contemporary distribution of individual fish species.[1404] Validation of these maps (based on data collected over the last twenty years) has shown them to be a very accurate representation of current distribution.

[1403] TW Carkeek, in Ngā Kaitiaki o Raukawa, *Ngāti Toarangātira, Āti Awa ki Waikanae, Ngāti Raukawa, Iwi Fisheries Claim Report* (Ōtaki: Ngā Kaitiaki o Raukawa, date unknown), p 75.

[1404] Joy, M. K., and R. G. Death. 2004. Predictive modelling and spatial mapping of freshwater fish and decapod assemblages using GIS and neural networks. Freshwater Biology 49:1036-1052.

7.9.1 Ūpokororo or Grayling *(Prototroctes oxyrhynchus)*

Known as the ūpokororo, grayling were highly valued by Māori,[1405] but are now extinct.[1406] They were last seen in the 1930s. The Southern graylings are found only in Australia and New Zealand and are closely related to the retropinnid smelts. The ūpokororo started to decline and began to disappear around the late 1800s and it was noted that few were seen around the turn of the century in the Ōtaki River.[1407]

7.9.2 Pōrohe, Ngaore, Paraki or Common Smelt *(Retropinna retropinna)*

The Southern smelts, like the ūpokororo, are found only in New Zealand and Australia. Smelts were known to Māori by a variety of names including tikihemi, porohe, and paraki. Smelt are one of the few anadromous native fish; this means they spend the bulk of their lives at sea and then travel up rivers to spawn at the end of their lives, although they can become 'lake locked' where they use lakes as the ocean phase. Lake Taupō is an example of this situation. The present distribution of smelt in the inquiry district is possibly little different now as the range shown on the map is what would be expected from other parts of New Zealand.[1408] However, Best noted:

> 'Small fish called tikihemi (smelt) is sometimes taken with īnanga. It is a scaly fish about 5 inches in length, flat sided and sharp nosed, having a blue stripe along its sides from gills to tail. It goes to sea about March, and comes up the streams with īnanga. They are not so plentiful as they used to be from Wellington to the Manawatū.'[1409]

McDowall noted that smelt are about the only native fish that have not been seriously harvested by recreational or commercial fisheries, and thus their numbers haven't been

[1405] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press.

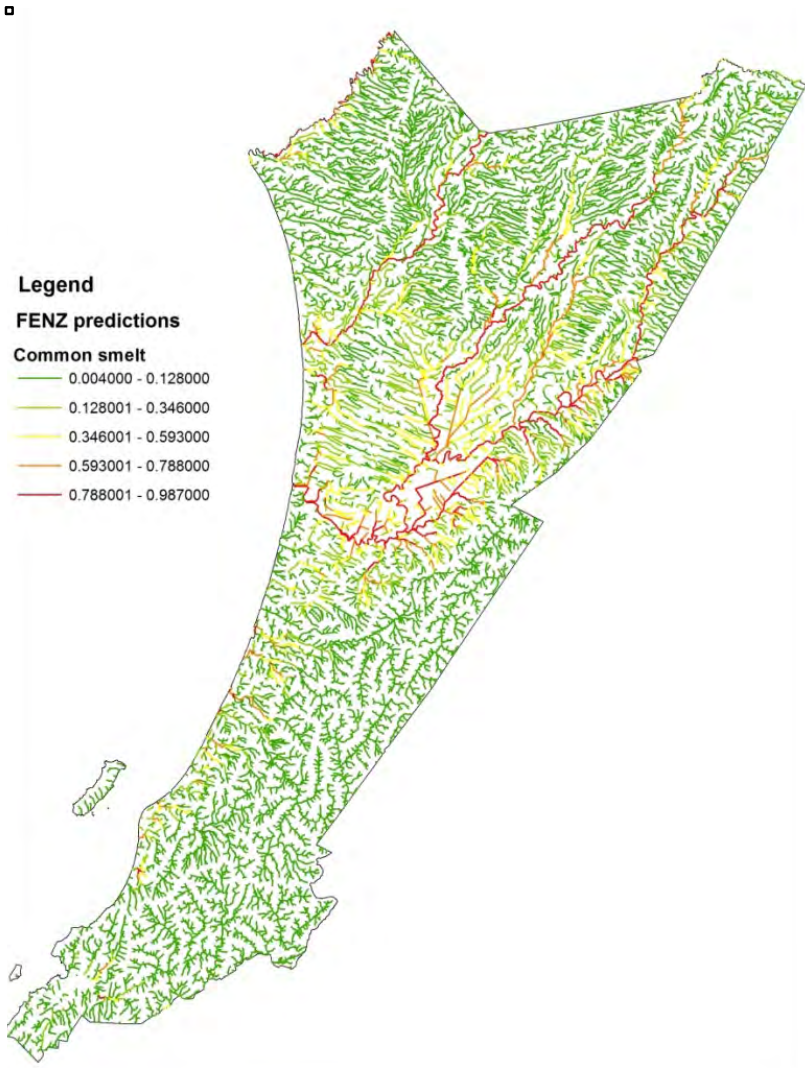
[1406] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1407] Best E 1929. Fishing methods and devices of the Māori. Dominion Museum Bulletin 12: 1 - 231

[1408] Joy MK 1998. Native fish diversity in the Oroua River and tributaries: a contribution to a study of the life supporting capacity of the Oroua River. A report to the Department of Conservation and the Manawatū-Wanganui Regional Council.

[1409] Best E 1929. Fishing methods and devices of the Māori. Dominion Museum Bulletin 12: 1 – 231, p 179.

severely impacted apart from the impacts on their habitats.[1410] Common smelt are currently not listed as threatened.[1411]



Map 79: **Predicted current distribution of smelt in the inquiry district.[1412]**

[1410] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press, p 261.

[1411] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1412] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.3 Giant Kōkopu *(Galaxias argenteus)*

The giant kōkopu is the largest of the three kōkopu species and is one of the five 'whitebait' species. It is currently listed as declining based on a 10-50 per cent decline.[1413] Apart from tuna, it was the largest freshwater fish Māori traditionally had available. This species is especially important in this evidence as its habitat includes wetlands and lakes; thus it has lost much of its habitat in the inquiry district. McDowall noted that giant kōkopu is listed as threatened as a result of this habitat loss:

> '… especially in areas like the Waikato, Manawatū and Canterbury where there has been extensive wetland drainage.'[1414]

Interestingly, Adkin only once mentioned kōkopu: when he was writing of what we now call banded kōkopu in a tributary of the Ōhau River called Wai-kōkopu .[1415] As McDowall noted:

> 'Somehow giant kōkopu were omitted by Adkin even though they must have been very common.'[1416]

Elsden Best recorded that kōkopu were taken during summer and autumn as in winter they deteriorate in quality.[1417]

The distribution map (Map 80) shows the current distribution mainly in the south of the inquiry district. Before wetland drainage and physical alteration of waterways, this species would have been right through the lower part of the Manawatū plains. Based on the fact that this species is commonly found in wetlands and lowland natural waterways, and given the decline of these habitats, it is possible to be very confident that within the

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[1413] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

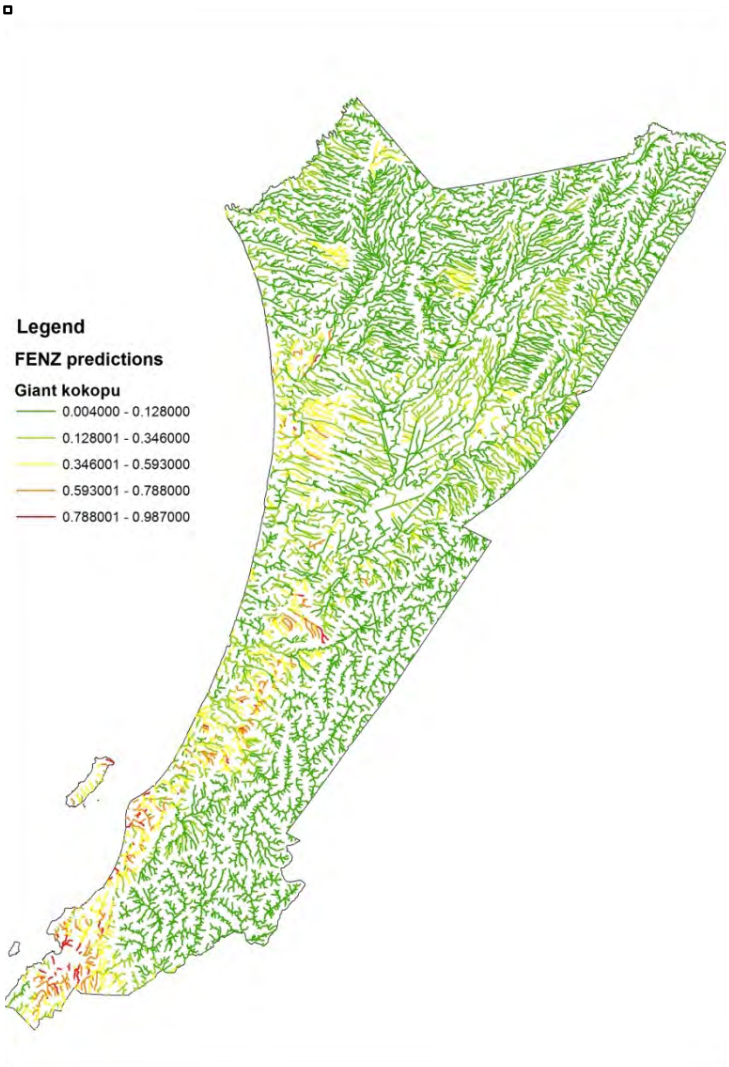
[1414] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press, p 596.

[1415] Adkin GL 1948. Horowhenua: its Māori place names and their topographic and historical background. Department of Internal Affairs, Wellington, p 270.

[1416] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press, p 270.

[1417] Best E 1929. Fishing methods and devices of the Māori. Dominion Museum Bulletin 12: 1 – 231, p 184.

inquiry district there has been a catastrophic decline in their abundance and distribution. Giant kōkopu are nationally listed as in 'gradual decline'.[1418]



Map 80: **Predicted current distribution of giant kōkopu in the inquiry district.[1419]**

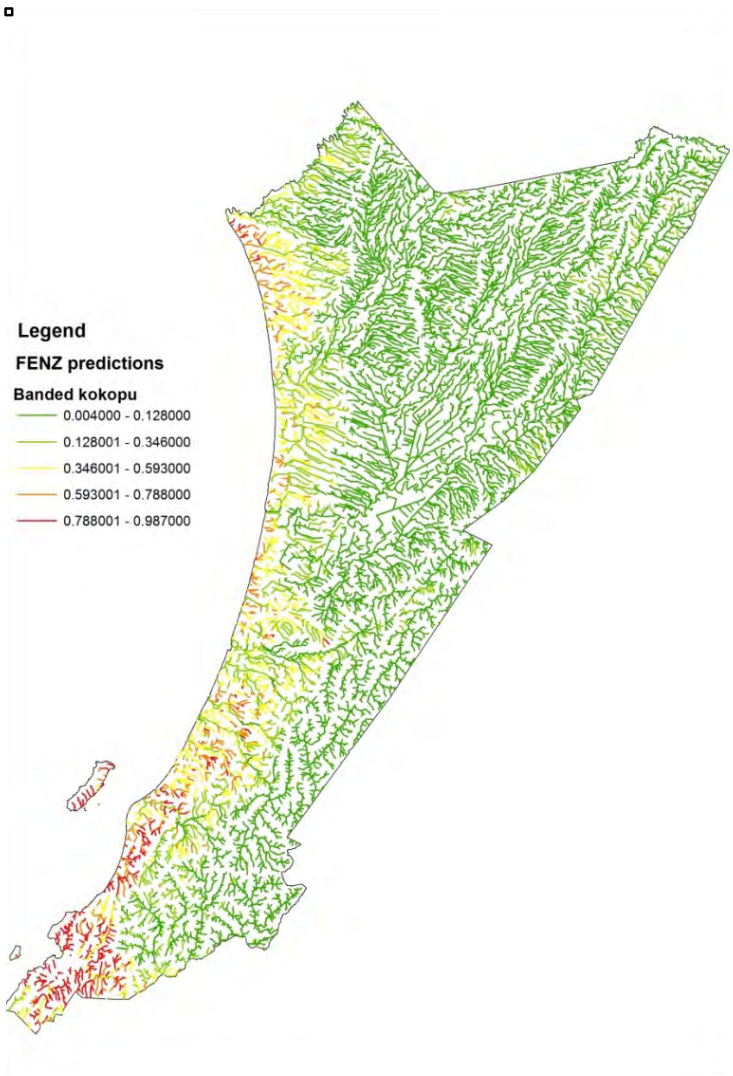
7.9.4 Banded Kōkopu *(Galaxias fasciatus)*

Banded kōkopu are the only one of the five whitebait species not listed as threatened although their range has been reduced.[1420] The current distribution map (Map 81) shows

[1418] Goodman JM, Dunn NR, Ravenscroft PJ et al. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1419] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

they are much more commonly found in the more forested and cleaner waterways in the south of the inquiry district than the more impacted northern part. Thus, there is likely to have been a significant loss of habitat for banded kōkopu in the inquiry district. Despite the detailed account of freshwater fisheries in the inquiry district, Leslie Adkin only once mentions banded kōkopu and then only in a tributary of the Ōhau.[1421]



Map 81: **Predicted current distribution of banded kōkopu in the inquiry district.**[1422]

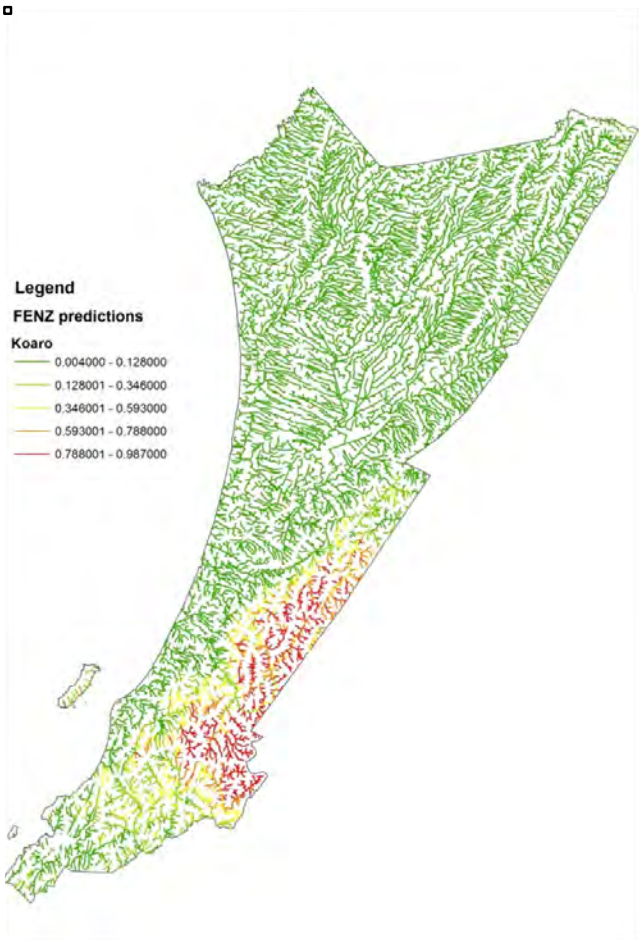
[1420] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1421] Adkin GL 1948. Horowhenua: its Māori place names and their topographic and historical background. Department of Internal Affairs, Wellington.

[1422] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.5 Kōaro - *galaxias brevipinnis*

Kōaro are generally the second most common species found in whitebait catches depending on the location around New Zealand but due to many impacts, they are now listed nationally as 'in decline'.[1423] The distribution map (Map 82) shows that they are now only found in reasonable numbers in the alpine areas of the Tararua ranges. This reveals that there has been a very significant loss of habitat for kōaro in the inquiry district as they are missing from much of the district, particularly the Ruahine ranges where they would have been found before land use changes. There are few mentions in historical reports about kōaro in the inquiry district, this may be because they are very cryptic and Pākehā writers may not have been aware of their existence.



Map 82: **Predicted current distribution of kōaro in the inquiry district.**[1424]

[1423] Goodman JM, Dunn NR, Ravenscroft PJ et al. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1424] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.6 Īnanga *(Galaxias maculatus)*

While there are five species that make up the whitebait catch, historians have tended to concentrate on īnanga when discussing whitebait. Īnanga are listed as in decline based on a 10-50 per cent decline in abundance and distribution nationally. Juvenile galaxiids (whitebait) were known to have been harvested by Māori using a range of methods. Best described some:

> '…a small net, called a rana and ranga [that] was used in taking white-bait on the east coast of the North Island. In the Ōtaki district a form of trap or net made of a thin rush called wiwi tane was used for this purpose.'[1425]

O'Donnell revealed that

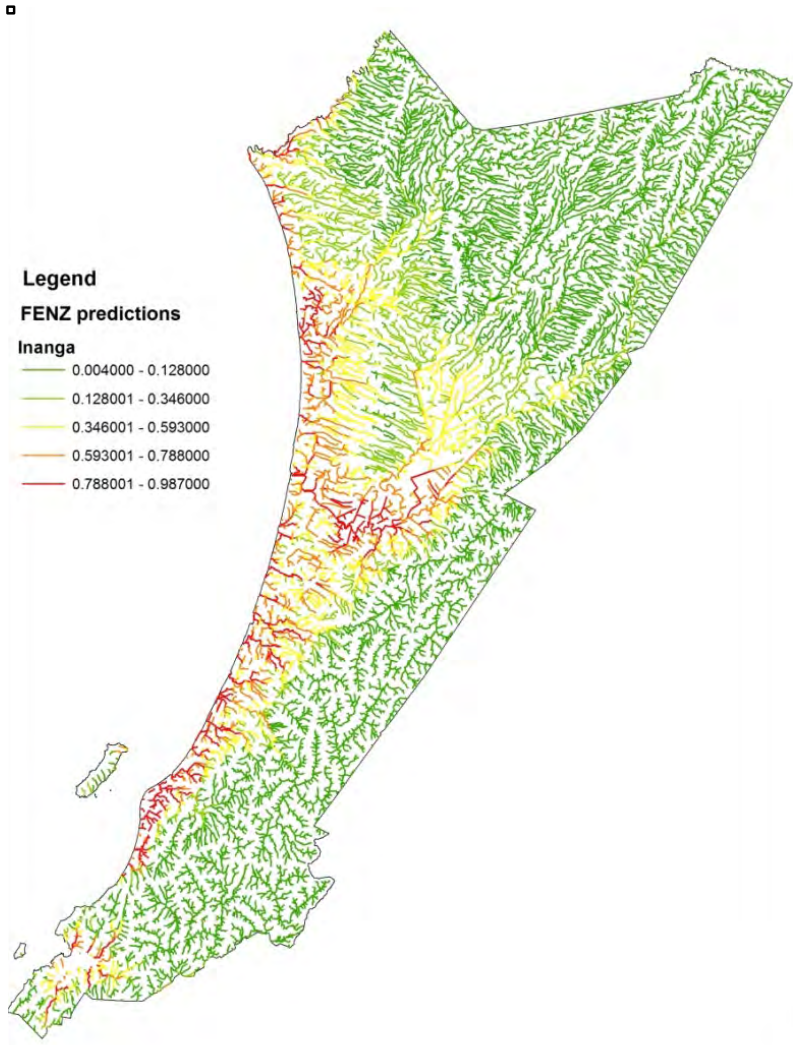
> 'Horowhenua Māori connected the upstream migrations of whitebait in spring and adult īnanga migrating downstream in August. This connection seemed to have been unknown by Europeans.'[1426]

O'Donnell also noted Māori at Hōkio

> '…feasting on the Īnangas, little balls of fat and roe – and very excellent they were too, cooked in a frying pan with butter.'[1427]

The distribution map (Map 83) shows the coastal distribution of īnanga, apart from the low elevation Manawatū River where they move well inland. Īnanga distribution has been much reduced and in the area occupied by īnanga there is likely to have been a reduction in density/abundance, but possibly not as severe as for the other four whitebait species.

[1425] Best E 1929. Fishing methods and devices of the Māori. Dominion Museum Bulletin 12: 1 – 231, p 172.
[1426] RA McDonald and E O'Donnell, *Te Hekenga: Early Days in Horowhenua* (Palmerston North: GH Bennett & Co Ltd, 1929), p 52.
[1427] Ibid.



Map 83: **Predicted current distribution of īnanga in the inquiry district.**[1428]

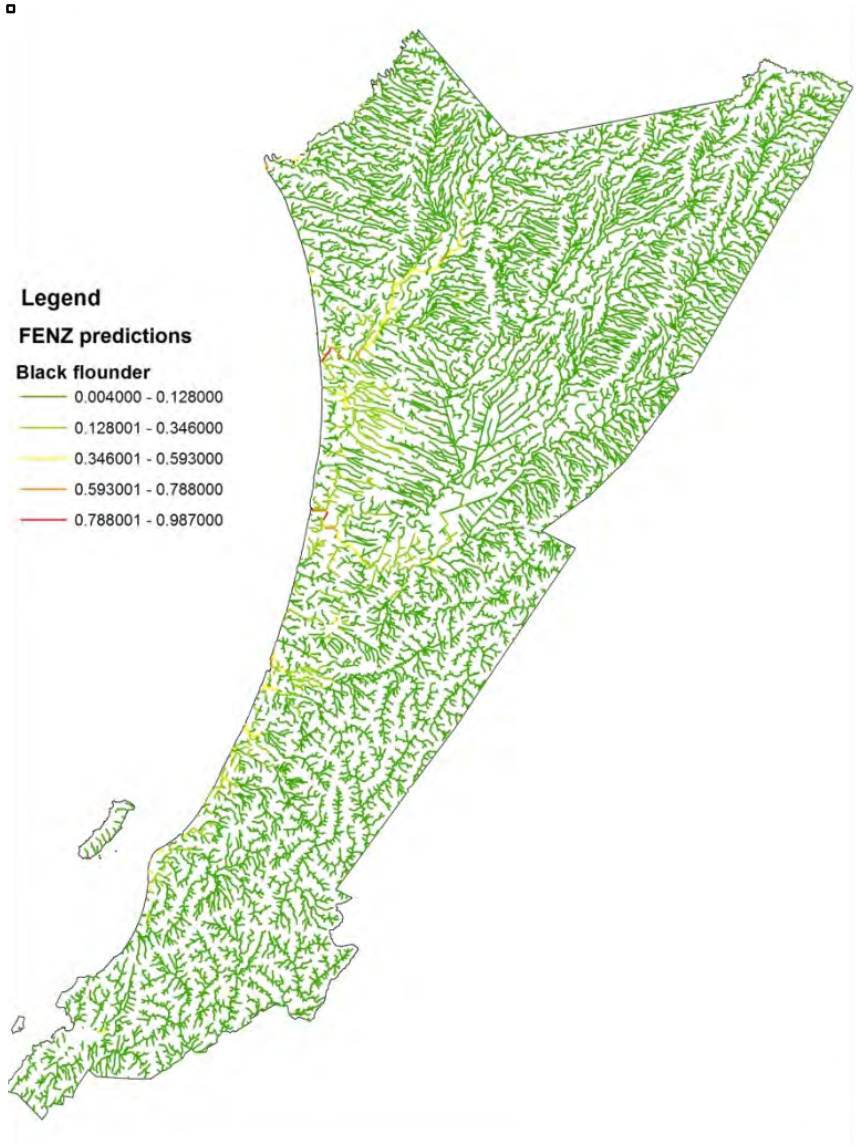
7.9.7 Black Flounder, Mohoao, Pātiki *(Rhombosolea retiaria)*

Black founder or pātiki are part of commercial and cultural fisheries in low elevation lakes such as Lake Onoke and Lake Wairarapa in the Wairarapa district. Black flounder are now rare in the inquiry district (Map 84), but it is not known how much the distribution has changed since European occupation. Black flounder are not currently listed as threatened but there is very little data available possibly because they are hard to sample.[1429]

[1428] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

[1429] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

'Pātiki were once abundant in Lake Horowhenua. They were also plentiful in the Ōhau River, Waitohu Stream, Ōtaki River and the Waikawa Stream. While they are no longer found in such large numbers or are as big, they are none-the-less still around and still a highly valued fish. They are dwindling in numbers.'[1430]



Map 84: **Predicted current distribution of black flounder in the inquiry district.**[1431]

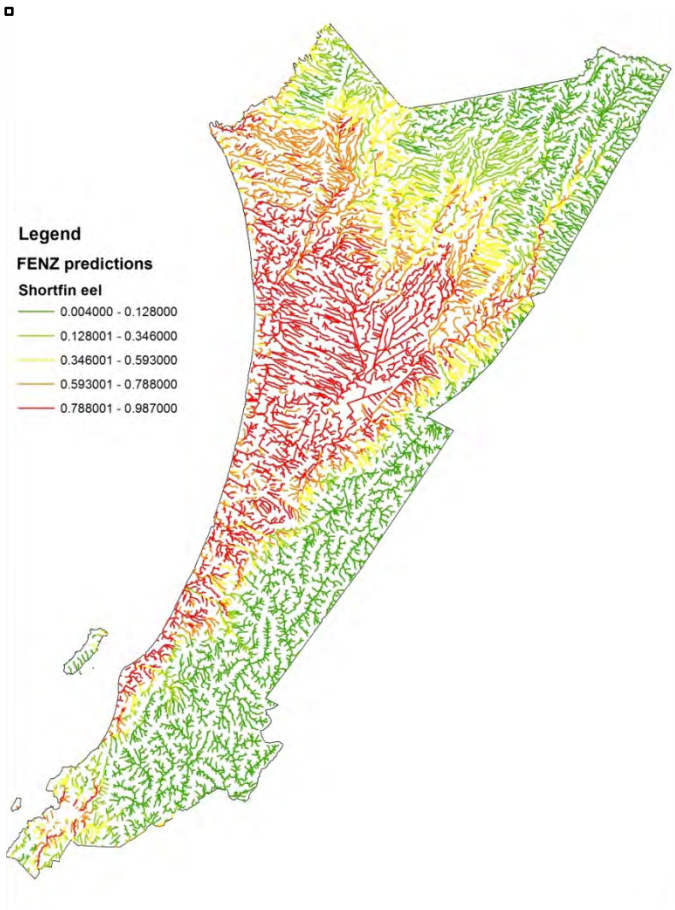
[1430] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

[1431] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.8 Shortfin Tuna *(Anguilla australis)*

The shortfin tuna is very tolerant of what would be thought of as poor water quality, and if anything they appear to be doing better where there are moderate amounts of eutrophication. They seem to be able to tolerate low oxygen and more nutrients. Habitat changes deleterious to most other species suit them as its means more food in the form of worms and snails.

Shortfin tuna current distribution (Map 85) in rivers has probably changed little but there would have been significant loss of habitat with the drainage of wetlands described above (section 7.3). Shortfin tuna are not currently listed as threatened.[1432]



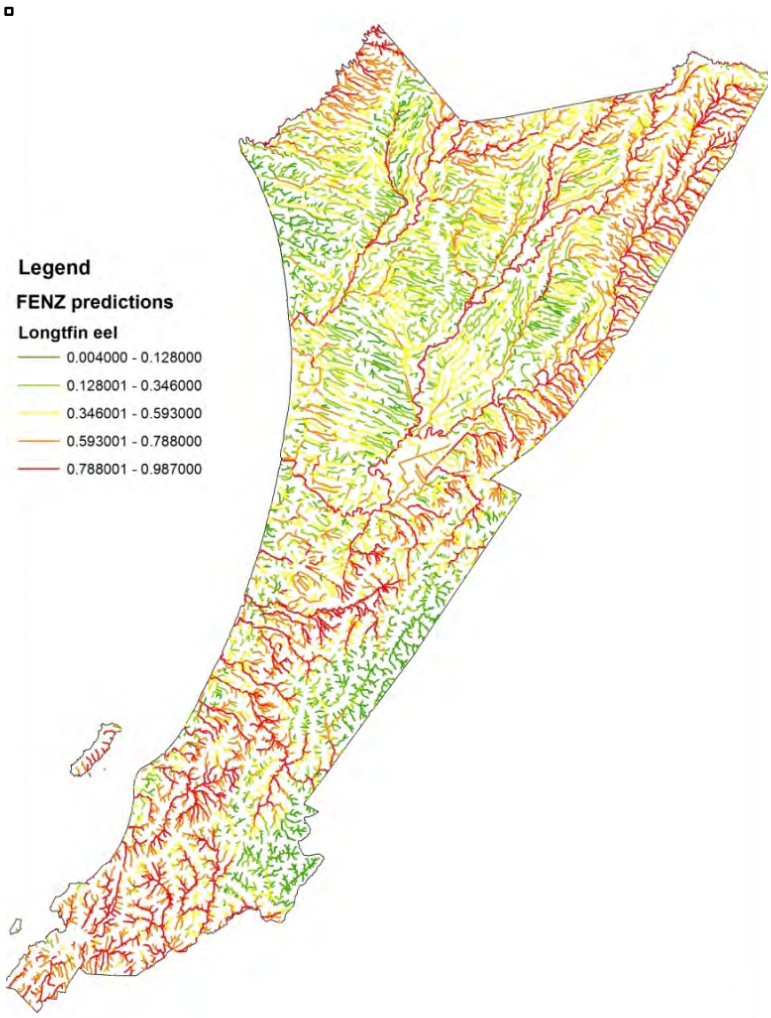
Map 85: **Predicted current distribution of shortfin eel in the inquiry district.[1433]**

[1432] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1433] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.9 Longfin Tuna - *Anguilla dieffenbachia*

Longfin tuna are listed as declining nationally with a range of decline listed as 10 – 70 per cent.[1434] The predictive map for longfin tuna (Map 86) clearly reveals a substantial reduction in their distribution. Before wetland drainage and development, they would have had a high probability of occurrence throughout most of the inquiry district but now the probability of finding them is highest only in the upper catchments where water-quality is highest. There is more information on tuna in section 7.5 above.



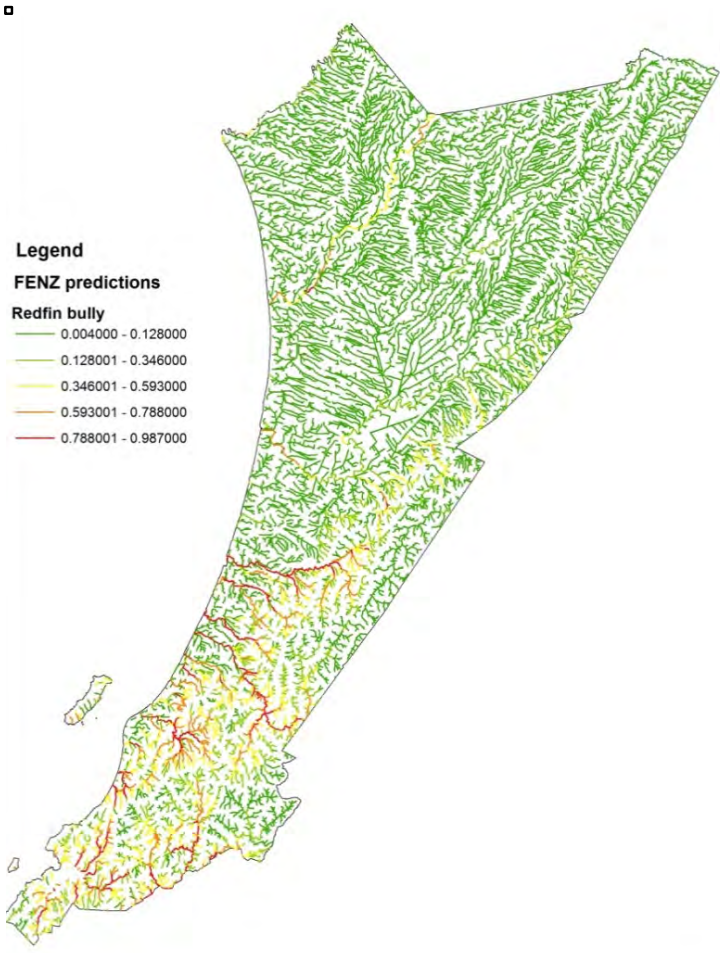
Map 86: **Figure 1. Predicted current distribution of longfin eel in the inquiry district.**[1435]

[1434] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1435] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.10 Redfin Bully *(Gobiomorphus huttoni)*

The redfin bully is known as an intolerant (intolerant of water quality and habitat impacts) native fish, so there presence is good indicator of a health waterways .[1436] Their distribution (Map 87) shows clearly the healthier waterways in the inquiry district. Rivers like the Ōtaki, Ōhau, Waikawa, and Waikanae have the majority of their catchments in native vegetation, and thus they have much better water and habitat quality than pastoral catchment waterways like the Manawatū and Oroua. Due to the degradation of waterways, redfin bullies are listed as threatened and in decline.[1437]



Map 87: **Predicted current distribution of redfin bully in the inquiry district.**[1438]

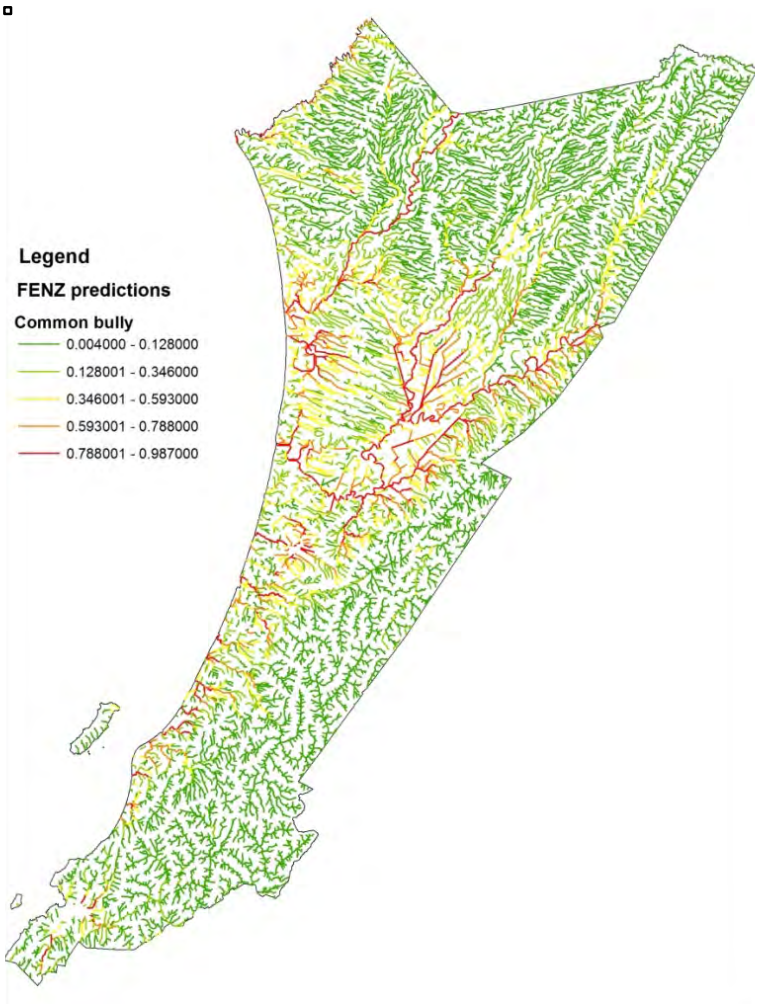
[1436] Joy M, Death R 2004. Application of the index of biotic integrity methodology to New Zealand freshwater fish communities. Environmental Management 34: 415-428.

[1437] Goodman JM, Dunn NR, Ravenscroft PJ et al. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1438] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.11 Common Bully *(Gobiomorphus cotidianus)*

Common bullies are broadly distributed throughout the inquiry district (Map 88), especially in the lowland waterways. They are tolerant of poor water quality and are not listed as threatened.[1439] Given their tolerance, it is not possible to know whether their abundance or distribution has changed in the last few hundred years in the inquiry district.



Map 88: **Predicted current distribution of common bully in the inquiry district.**[1440]

7.9.12 Cran's Bully *(Gobiomorphus basalis)*

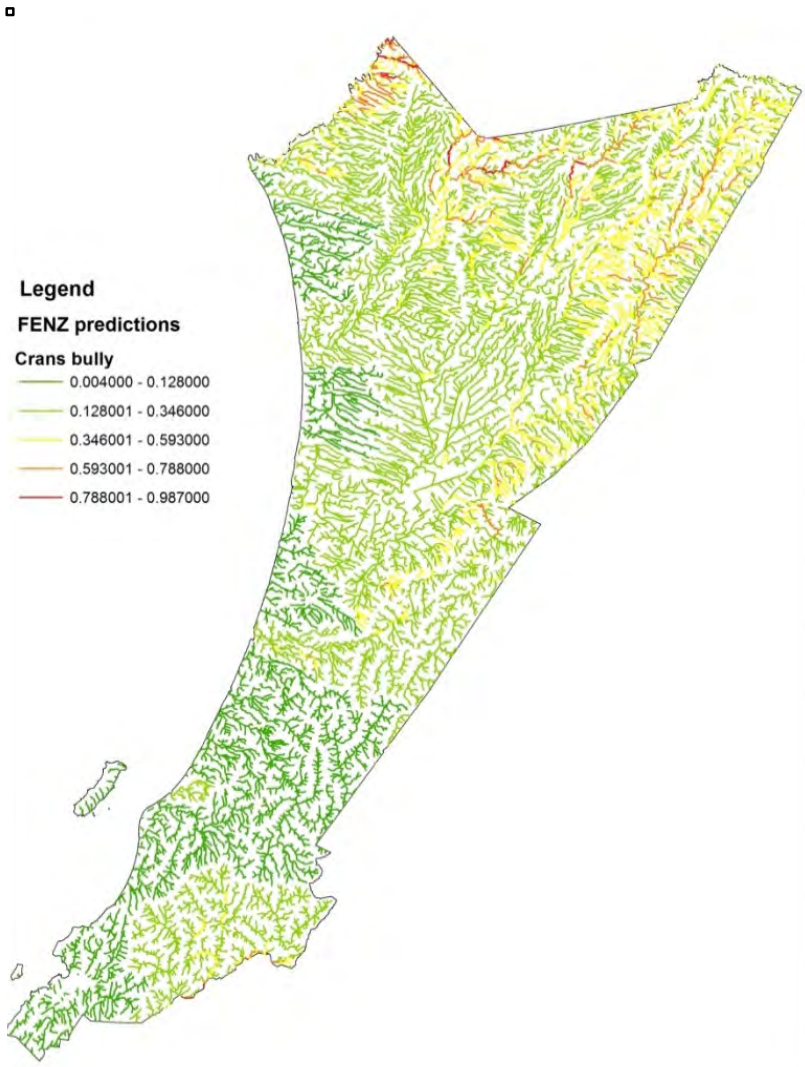
Cran's bully is one of two non-migratory bullies found in the inquiry district, the other is the upland bully. Cran's bullies are only found in the North Island. Upland bully, the

[1439] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1440] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

other non-migratory bully, are found in the South Island and southern half of the North Island. Neither species are listed as nationally threatened.

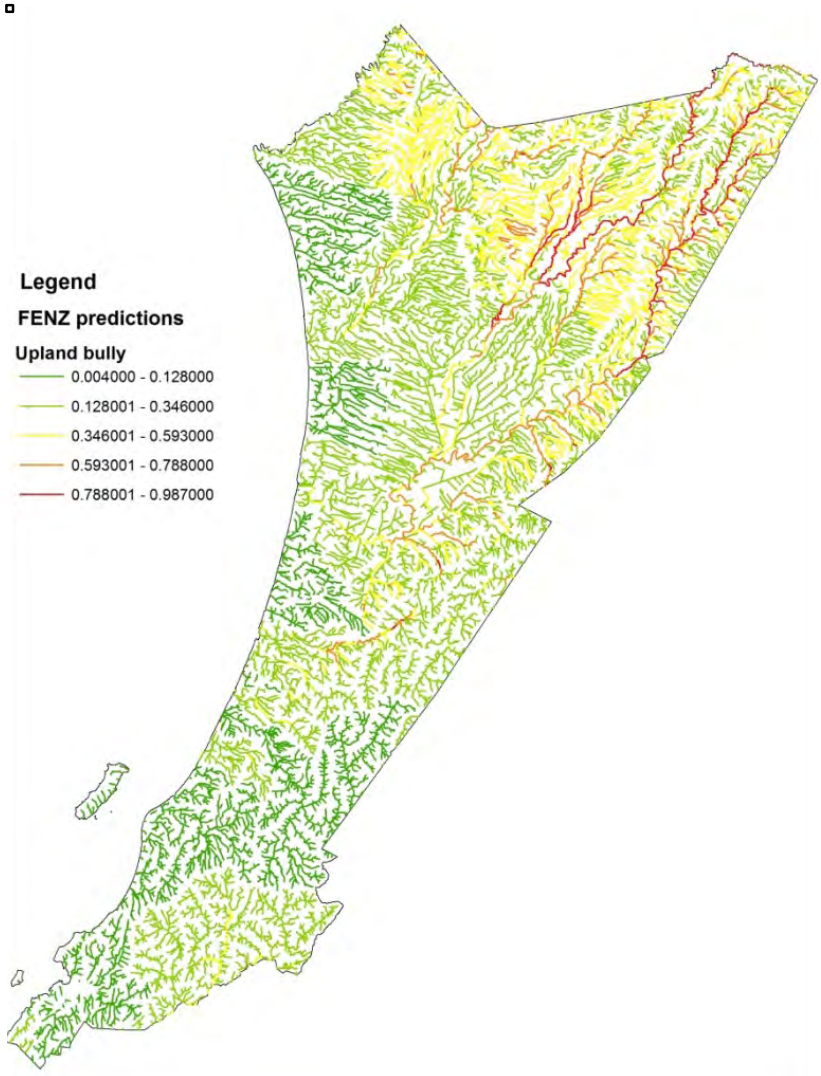
The two non-migratory bullies are very tolerant of degraded conditions and thus given the degradation of water quality, it is possible they have become abundant and widespread in the inquiry district.



Map 89: **Predicted current distribution of Cran's bully in the inquiry district.**[1441]

[1441] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.13 Upland Bully *(Gobiomorphus breviceps)*



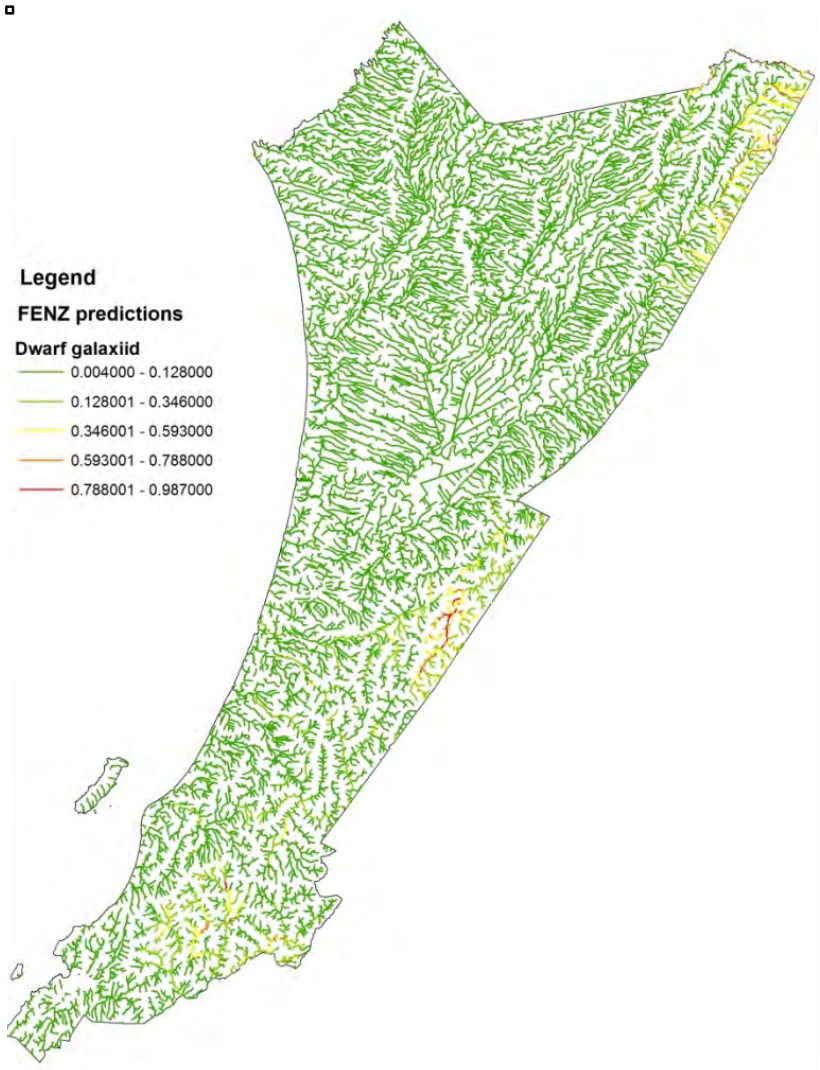
Map 90: **Predicted current distribution of upland bully in the inquiry district.**[1442]

7.9.14 Dwarf Galaxiid (*Galaxias divergens*)

The dwarf galaxiid is a small pencil shaped galaxiid fish; they are non-migratory and found in the lower North Island and upper South Island in the foothill and upstream mountain areas, particularly in small streams. They are found in fast flowing riffle parts of these streams but are generally not found where trout are found, probably due to predation. There are many examples of small galaxiids excluded by trout but the dwarf

[1442] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

galaxiids are the clearest example in the inquiry district.[1443] Dwarf galaxiids are listed as in decline nationally.[1444]



Map 91: **Predicted current distribution of dwarf galaxiid in the inquiry district.[1445]**

[1443] McIntosh, A. R., P. A. McHugh, N. R. Dunn, J. M. Goodman, S. W. Howard, P. G. Jellyman, L. K. O'Brien, P. Nystrom, and D. J. Woodford. 2010. The impact of trout on galaxiid fishes in New Zealand. New Zealand Journal of Ecology 34:195-206.

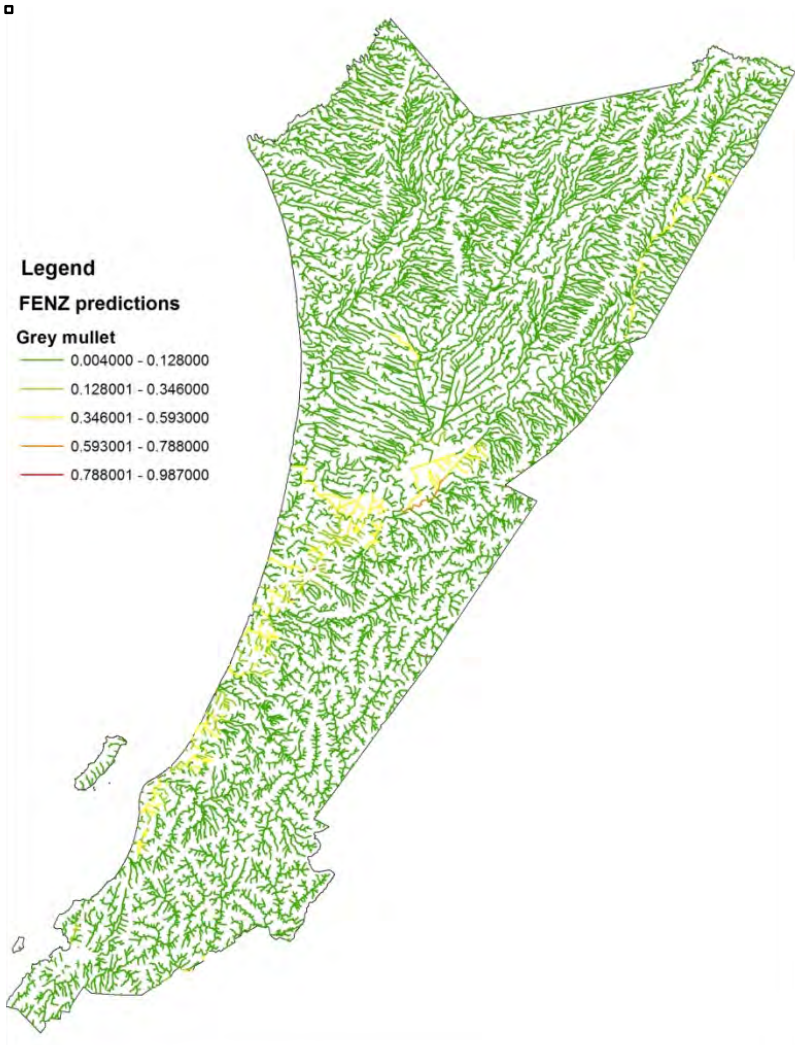
[1444] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1445] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.15 Grey Mullet *(Mugil cephalus)*

Grey mullet are not listed as threatened, and, as there is very little information on their distribution it is not possible to discuss any likely changes in distribution since colonisation.

> 'This is an important fishery in the Manawatū River, Ōhau River, and in some coastal lakes.'[1446]



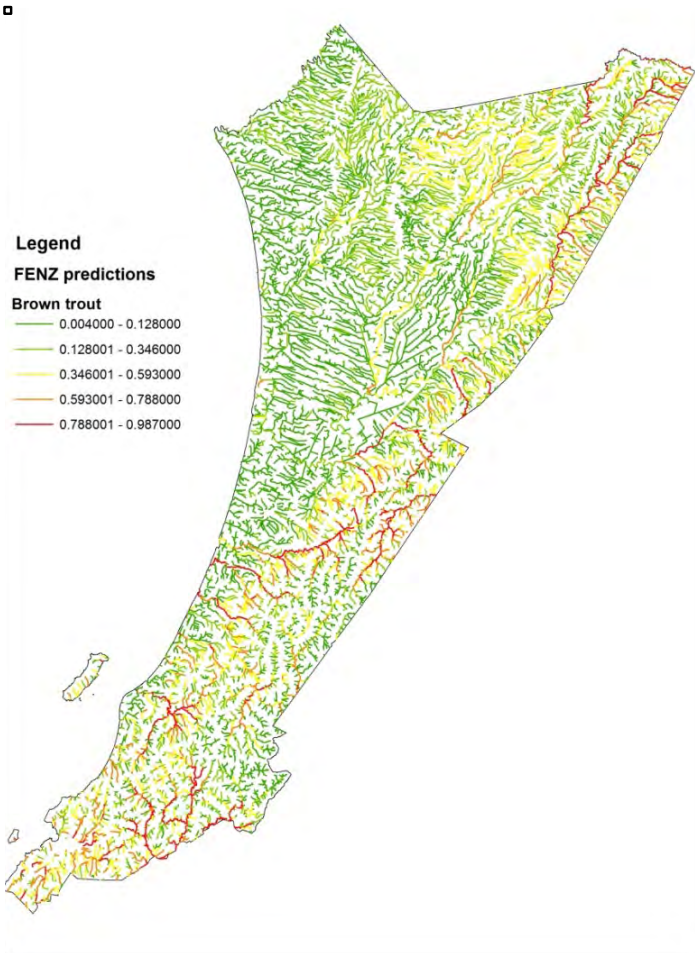
Map 92: **Predicted current distribution of grey mullet in the inquiry district.**[1447]

[1446] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

[1447] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.16 Brown Trout *(Oncorhynchus mykiss)*

Brown trout are native to Europe and Russia, but have been released any many parts of the globe in temperate regions. They are found throughout New Zealand, except the Chatham Islands and the far north of the North Island. They were introduced from around 1867 and a huge effort was put in to develop coverage over the whole country.[1448] Their distribution in the inquiry district has grown since first releases, although more recent degradation water quality and competition with rainbow trout may have reduced abundance and distribution as there is evidence of a recent decline nationally.[1449]



Map 93: **Predicted current distribution of brown trout in the inquiry district.**[1450]

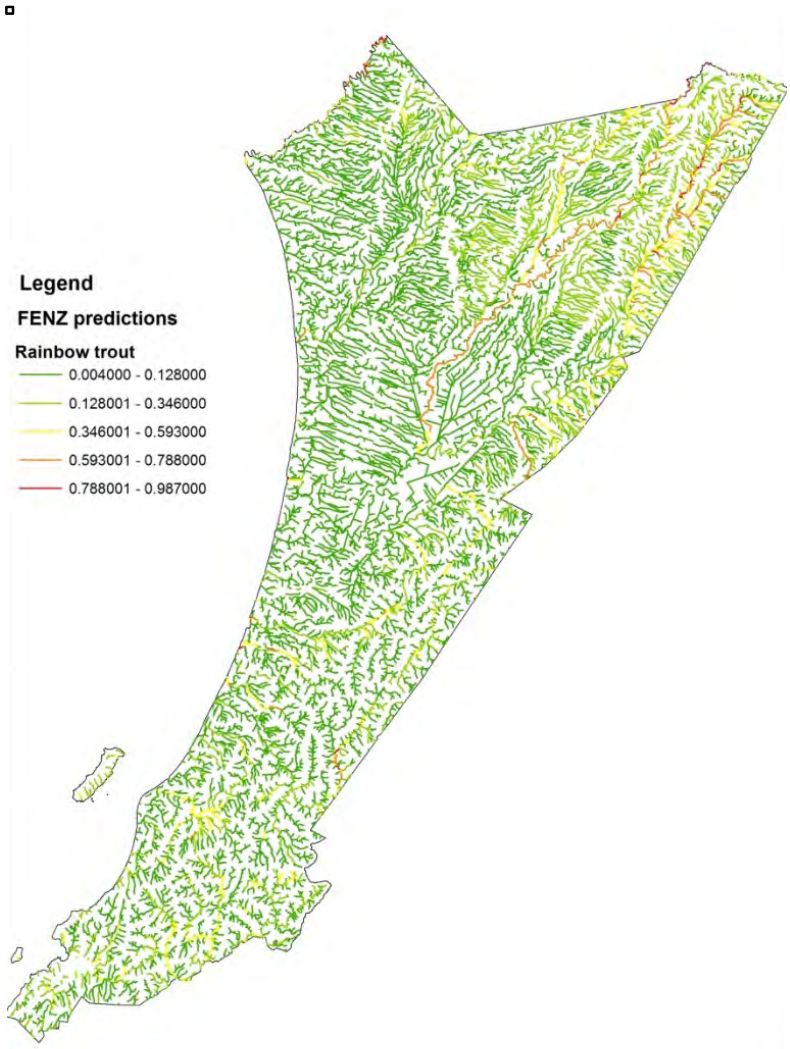
[1448] McDowall, R. M. 1990. New Zealand Freshwater Fishes: A Natural History and Guide. Heinemann Reed, Auckland.

[1449] Joy, M. K. 2010. Temporal and land-cover trends in salmonid distribution in New Zealand's rivers: a predictive distribution map and analysis of data from the New Zealand Freshwater Database - 1970 - 2007 Massey University, Palmerston North.

[1450] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.17 Rainbow Trout *(Oncorhynchus mykiss)*

Rainbow trout are natives of North America and were introduced to New Zealand in the late 1800s. It is primarily a lake fish although they are well spread throughout New Zealand.[1451] Rainbow trout are found throughout the inquiry district, although as with the brown trout, water quality degradation may be impacting on their abundance. At the national level, they appear to be declining alongside brown trout.[1452]



Map 94: **Predicted current distribution of rainbow trout in the inquiry district.[1453]**

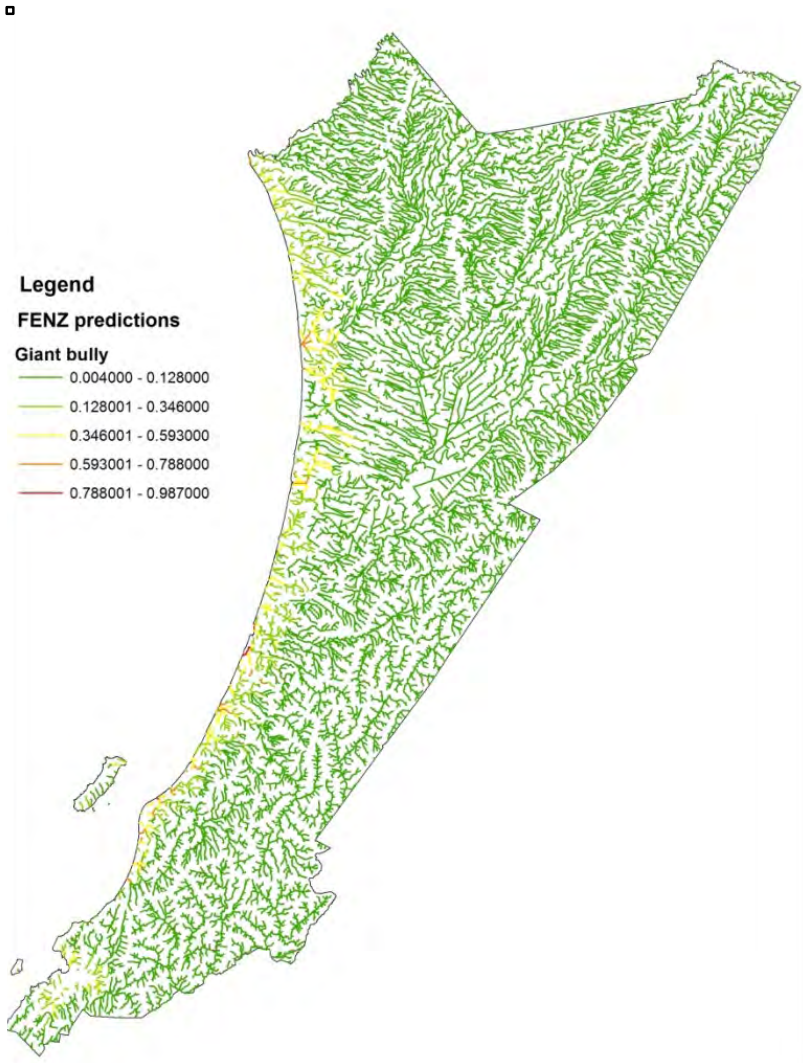
[1451] McDowall, R. M. 1990. New Zealand Freshwater Fishes: A Natural History and Guide. Heinemann Reed, Auckland.

[1452] Joy, M. K. 2010. Temporal and land-cover trends in salmonid distribution in New Zealand's rivers: a predictive distribution map and analysis of data from the New Zealand Freshwater Database - 1970 - 2007 Massey University, Palmerston North.

[1453] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division. 57 p.

7.9.18 Giant Bully *(Gobiomorphus gobiodes)*

This species is 'found quite widespread throughout the inland waterways within this inquiry district.'[1454]



Map 95: **Predicted current distribution of giant bully in the inquiry district**[1455]

7.9.19 Lamprey *(Geotria australis)*

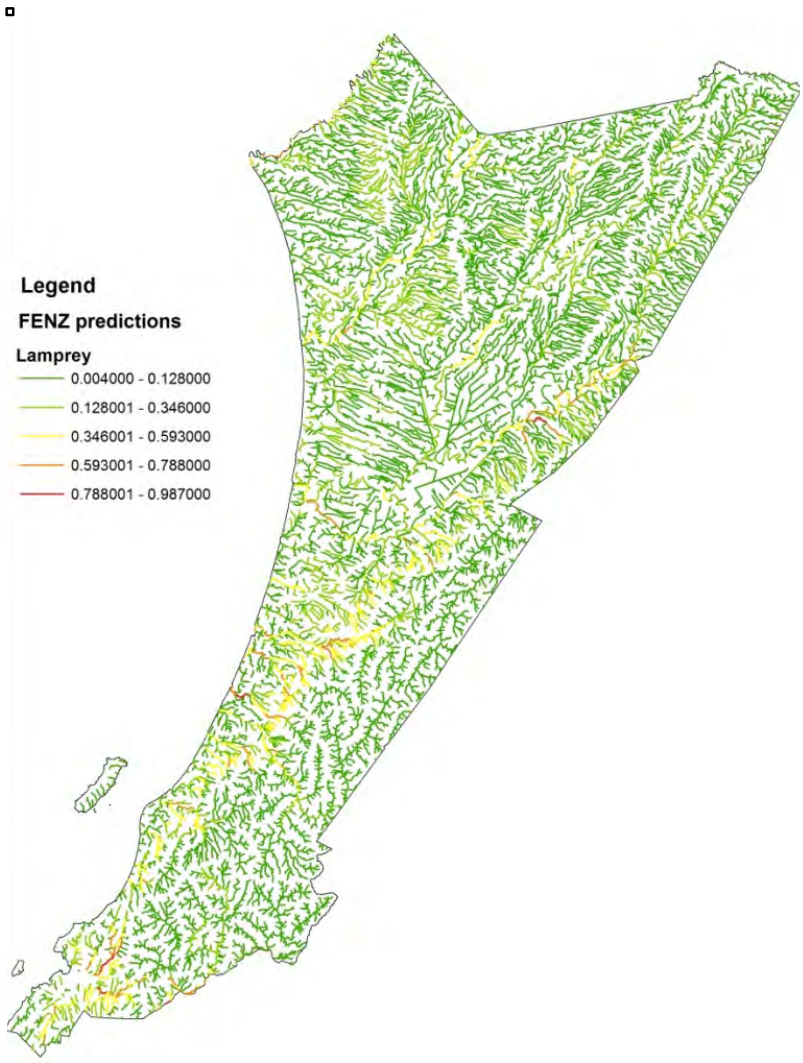
Lamprey are declining nationally and are listed as vulnerable. They were once an important food source for Māori but are now extremely rare. There are few records of

[1454] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

[1455] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

lamprey within the inquiry district, with the main fishing areas the Whanganui River and in Southland waterways.[1456]

> 'Lamprey, also known as Piharau, are found locally in the Ōtaki River, the Waitohu Stream, and historically in the Mangapouri. They are increasingly rare.'[1457]



Map 96: **Predicted current distribution of lamprey in the inquiry district.**[1458]

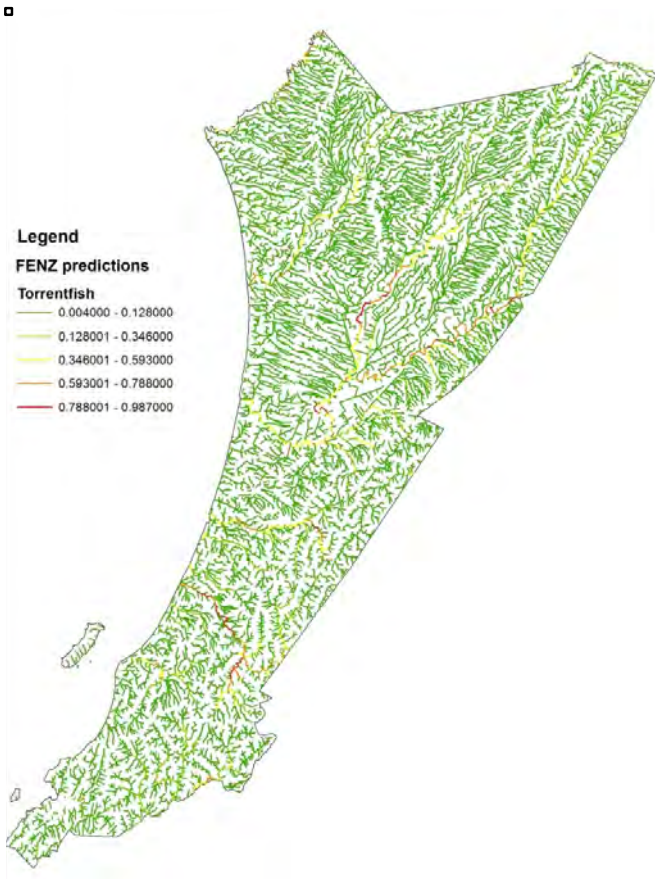
[1456] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press.

[1457] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.

[1458] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.20 Panoko or Torrentfish *(Cheimarrichthys fosteri)*

Torrentfish are found in larger rivers in the fast flowing riffle zones of gravelly rivers on lower plains. For example, they are abundant in the Ōtaki River reaching high densities in the riffle zones there. Elsdon Best wrote that panoko were abundant in the inquiry district in the Waikawa, Waitohu, Rangiuru, and Waimea streams, and that they would take hooks baited for eels.[1459] Best also described traps for the capture of panoko based on evidence from his Ōtaki informant.[1460] He described a trap with an opening facing upstream, that Robert McDowall suggested might have been to catch ripe females moving downstream to spawn.[1461] They are listed as at risk and are declining nationally.[1462]

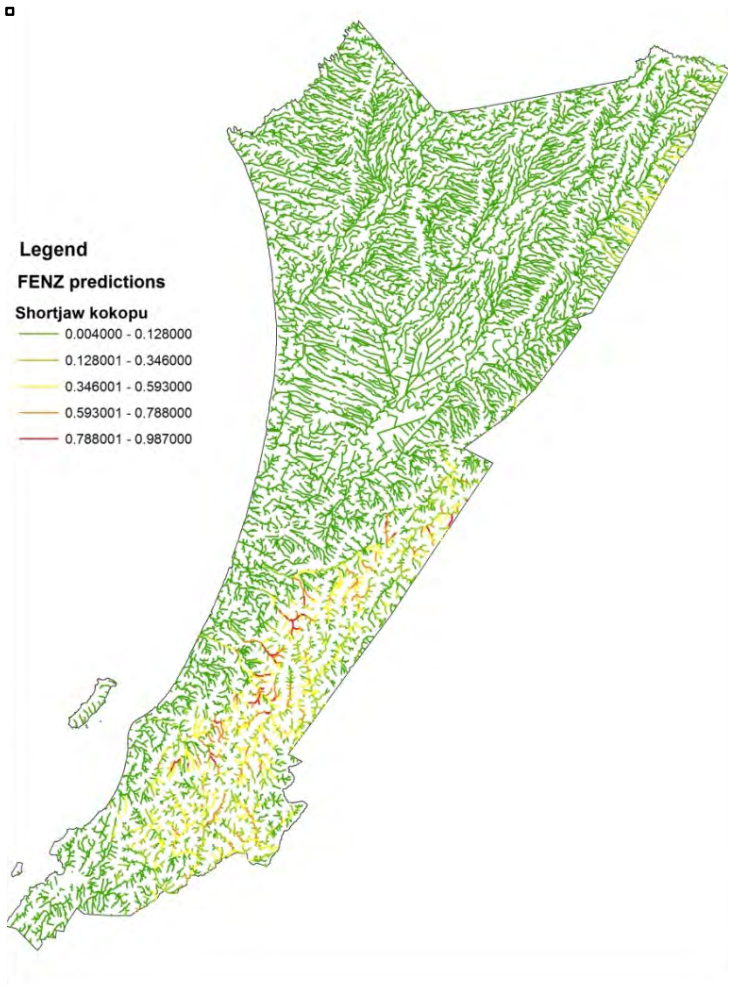


Map 97: **Predicted current distribution of torrentfish in the inquiry district.[1463]**

[1459] Best E 1929. Fishing methods and devices of the Māori. Dominion Museum Bulletin 12: 1 - 231.
[1460] Best E 1929. Fishing methods and devices of the Māori. Dominion Museum Bulletin 12: 1 - 231.
[1461] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press.
[1462] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.
[1463] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.9.21 Shortjaw Kōkopu *(Galaxias postvectis)*

Shortjaw kōkopu are another of the large bodied galaxiids and are one of the five whitebait species. They prefer clean bouldery rivers with much instream cover and have thus been impacted by declines in water quality and loss of habitat and are listed as in decline and nationally vulnerable.[1464] It is difficult to ascertain their importance to Māori as they seem to have been confused with other kōkopu. McDowall noted it was not clear whether Māori distinguished shortjaw from the other large kōkopu, giant and banded.[1465]



Map 98: **Predicted current distribution of shortjaw kōkopu in the inquiry district.[1466]**

[1464] Goodman, J. M., N. R. Dunn, P. J. Ravenscroft, R. M. Allibone, A. T. Boubee, B. O. David, M. Griffiths, N. Ling, A. Hitchmough, and J. R. Rolfe. 2013. Conservation status of New Zealand freshwater fish, 2013. NEW ZEALAND THREAT CLASSIFICATION SERIES 7.

[1465] McDowall RM 2011. Ikawai: Freshwater fishes in Māori culture and economy. Christchurch, Canterbury University Press.

[1466] J R Leathwick, D. West, P. Gerbeaux, D. Kelly, H. Robertson, D. Brown, Chadderton WL, Ausseil A-G 2010. Freshwater Ecosystems of New Zealand (FENZ) Geodatabase: VERSION ONE – AUGUST 2010 USER GUIDE Department of Conservation, Research & Development Division.

7.10 Concluding Remarks

There were three main processes by which the Crown reduced the availability of crucial inland waterway resources and the fishes in them. The first was the consequence of the purchase of land by the Crown and settlers, whereby they controlled vast stretches of land alongside waterways, and thus, controlled access to these waterways. The second was the fundamental freshwater community changes brought about by the introduction of exotic fish species, and the initial actions of the organisations representing these fish wanting to remove tuna because of perceived impacts on the introduced fish. Third was the degradation of waterways permitted and encouraged by the Crown, through a multitude of changes brought about by vegetation clearance, wetland drainage, building towns near rivers so that stop banking is required, and permitting the discharging of municipal and industrial waste into rivers and lakes. More recently, the Crown has failed to protect freshwaters by allowing unlimited intensification of agriculture with consequent impacts on water quality (see Chapter 6 for details).

The examples in this chapter starkly reveal the failure of the Crown to protect healthy freshwater ecosystems and the fisheries they supported; the failings are most obvious at the landscape scale change. The extent of landscape and land use change in the inquiry district since colonisation has been immense. Nearly all natural vegetation habitat types have been reduced, 94 per cent of the natural vegetation was removed and in most cases replaced with pasture. Wetlands previously dominated the lowland landscapes especially in the northern half of the inquiry district, and now 88 per cent of these have been removed – drained or covered over, and the remaining wetlands are in a poor state. The value of these lost wetlands is immense and using their ecosystem services value to indicate this in dollar terms the loss is somewhere between $7.0 and 8.6 billion. The loss of habitats for fish can also allow for the assessment of the fisheries value and biomass lost. This assessment revealed that somewhere between 9,800 and 180,000 tonnes of tuna have been lost.

The draining of wetlands and forest clearance has had profound impacts on the value of the natural landscape in the inquiry district to Māori in many ways including the direct loss of habitat as well as the erosion of habitat quality for fish and birds. After initial destruction of habitat in the early colonial period, the damage continues to this day through Crown or private development schemes on rivers and lakes including sewage

discharges, farming intensification and water abstraction (details in Chapter 6). The loss of habitat for fish has occurred on multiple fronts; through the actual physical loss of and degradation of waterways and wetlands, and through the loss of access to remaining waterways.

8. HAPŪ AND IWI WELLBEING

8.1 Introduction

This chapter turns to outline the impacts experienced by hapū and iwi claimants as a consequence of the devastation of their inland waterways in the inquiry district authored by the Crown and its delegated local agents. While many of these impacts have been noted throughout the report, the purpose here is to collate and consider these impacts as a whole. Alongside claimants' oral evidence of these impacts, the chapter also includes an analysis of statistical measures of iwi wellbeing provided by census data, the Te Kupenga survey on Māori wellbeing, and the recently compiled District Health Board Māori profiles. The chapter concludes with an overview of the marae-, hapū-, and iwi-led projects undertaken over the last few decades to restore and revitalize both the mauri of themselves as tangata whenua and their taonga waterways.

8.2 Impacts on Wellbeing

The devastating impacts of colonisation on Māori have, in the main, been attributed to the near wholesale transfer of lands from hapū and iwi possession to Crown and Pākehā settler ownership. Indeed, Raeburn Lange's report on the impacts of colonisation and land loss on hapū and iwi in the inquiry district concluded by saying that:

> 'The circumstance that underlay almost every other aspect of the Māori situation in the twentieth century was the loss in the previous century of the bulk of the land formerly controlled by the iwi of the region.'[1467]

The report detailed how the loss of land effectively removed Māori from an economic base of huge potential, and whose monetary value was soon realised by its new owners through the creation of highly productive farms. The report also detailed the difficulties experienced by many of the remaining Māori landowners in making their smaller, flood-prone, and less fertile tracts of land profitable in the new farming economy, and the decades-long delay in Crown funding assistance for them to develop these lands as

[1467] R Lange, *The Social Impact of Colonisation and Land Loss on Iwi of the Rangitikei, Manawatū, and Horowhenua Region 1840-1960* (Wellington: Crown Forestry Rental Trust, 2010), p 245.

promised in land purchase negotiations – but which were being extended to Pākehā farmers.[1468]

This historical report, along with similar reports,[1469] adds a new layer to that analysis. As detailed in the previous chapters, the new farming economy was not only founded on the acquisition of land from hapū and iwi, it was also founded on the incremental destruction of the previous economy developed and utilised by tangata whenua in the inquiry district: the vast array of resources for food, trade, housing, clothing, and medicines provided by their extensive waterscape of lakes, wetlands and swamps, rivers, streams, and springs.

The transformation of the inquiry district's vast network of inland waterways for the new economy devastated more than resources. It has also devastated many sites of cultural and spiritual significance – those used for the birthing of the next generation, those used for spiritual rituals and cleansing and healing, and those used for the washing and preparation of tūpāpaku before burial. It has also devastated or eroded a number of urupā located in or adjacent to waterways. For some waterways, it has meant the killing off of the taniwha who have, alongside kaitiaki, been the guardians and protectors of their mauri.

This destruction occurred through a multiplicity of Crown actions and failures, and not just those related to unfettered land acquisition which limited hapū and iwi access to many of their waterways. It also occurred through the Crown's failure to recognise and respect the tino rangatiratanga of hapū and iwi over their waterways and their customary use of them, as guaranteed in Te Tiriti o Waitangi. In denial of the ongoing rights of hapū and iwi to their waterways, and assuming the rights over waterways to themselves to utilise as they saw fit, the Crown authorised the mass felling of forests and ongoing drainage of wetlands to create pasture land for farming, the modification of major river systems to protect towns and highly valued farm lands from flooding, and has allowed the degradation and pollution of waterways to support the development and expansion of farming endeavours and settlement in the inquiry district.

In so doing, the Crown failed to provide for hapū and iwi in the inquiry district to continue to draw their economic livelihoods and spiritual sustenance from their lakes, swamps, rivers, streams, and springs. In its place, and in their own singular interest, the

[1468] Ibid.
[1469] See for instance, D Alexander, *Rangitikei River and its Tributaries Historical Report*, Wai 2180 document #A187, November 2015.

Crown privileged the economy of farm-based production and near destroyed the environment and a Māori cultural way of life.

As detailed in this historical report, and particularly in the cultural perspectives reports that accompany it, the impacts of these Crown actions and failures on the wellbeing of hapū and iwi in the inquiry district have been immense.[1470] The full extent of these impacts were not immediately apparent, however, and instead developed over time. While access to many waterways was impeded by land sales, hapū and iwi continued for some time to live by and rely heavily on those still in their ownership, where access was allowed by the new owners, or where their customary rights were recognised – and particularly for food which continued to be traded with one another. This was significant as they were generally unable to make a sufficient living in the new farming economy – either as farmers on their remaining lands or as inequitably paid wage-labourers for Pākehā landowners. But despite being in hapū and iwi ownership, these waterways, as with all waterways, were controlled and managed not by them but by the local government bodies established by the Crown.

Utilising a plethora of legislation passed by Parliament and assented to by the Crown, the local bodies in the inquiry district sought to further develop the inquiry district for settlement, farming, and industry over the preceding decades. As a consequence, these waterways and their once abundant fisheries and plant life were further degraded by ongoing drainage projects, flood control modifications, gravel extraction schemes, water abstraction schemes, and the introduction of new species of fish, and were polluted by numerous sources of discharge and run-off into them. For most claimants, many of their waterways either ceased to exist, were inaccessible, or became too compromised to support adequate stocks of fisheries and thus feed and sustain them – physically, economically, and spiritually.

Their ability to maintain existing enterprises, such as the trapping and cultivation of tuna were prohibited. Opportunities to develop new enterprises from their waterways and participate in the new economy, including the extraction and sale of gravel and shingle

[1470] H Smith, *Porirua ki Manawatū Inland Waterways Cultural Perspectives Report* (Wellington: Crown Forestry Rental Trust, forthcoming); and M Poutama, A Spinks, and L Raumati, *Porirua ki Manawatū Inquiry: Collation of Oral Narratives for Inland Waterways – Cultural Perspectives Draft Report* (Wellington: Crown Forestry Rental Trust, 2016).

from river beds, was also prohibited – and has instead been controlled by local authorities with the profits accrued by private companies.

In response to their increasing inability to sustain themselves even partially from their waterways, many claimants whānau moved from their rural, lake-river-stream-based settlements to the districts' townships, or further afield to cities such as Wellington, and the possibilities they offered for a better life as wage-labourers elsewhere – and particularly from the 1950s onwards. The high rate of urban migration of Māori in the inquiry district was almost as high as in New Zealand generally, where it was almost twice that of the Pākehā rate. The Māori population in cities rose by 42 per cent between 1951 and 1956, and by 65 per cent between 1956 and 1961. In the late 1950s, the rate of Māori population increase in Wellington, the destination of many whānau in the inquiry district, was 90 per cent.[1471]

Claimants talked of the many consequential impacts of these moves on their lives and on those of their whanaunga over time: the dislocation from their waterways and disconnection from their culture and identity; the diminishment of their store of ancestral knowledge associated with caring for waterways and of how to live with and from them including the knowledge of weather patterns, the seasonal māramataka, and the skills involved in making fishing devices such as hīnaki; the reduced opportunities to pass this knowledge to future generations; and the inability of their children and grandchildren to experience the joys of swimming in and gathering kai from their waterways, and the whanaungatanga and manaakitanga experienced as a core part of these activities where kai was collected communally and shared out to other whānau. Another significant consequential impact has been the extinguishment of te reo and tikanga Māori in many of their lives as a result of no longer living communally around their waterways.[1472]

> 'Ko Ngāparetaihinu Mautini Kereana Katarina Kahealani Heremia Te Tihi Bennett-Ogden – this is my baby and unfortunately, she won't get the same rights and privileges that I've enjoyed. She won't get the opportunity to eat from the Ōhau River or from the Kuku Stream or the opportunity to bathe in the Ōhau River like I did…. Her swimming pool will be the Haruatai and Levin pools with chlorine. That's where she had her first swim not in the Ōhau. …. Lucky for us

[1471] R Lange, 2010, pp 173-174.
[1472] H Smith, forthcoming; and Poutama, Spinks, and Raumati, 2016.

> we can still get pipi and tuatua at Ōtaki beach but I'm wondering how much longer that will last…. I definitely know I wouldn't set a net across the Ōhau River not like we used to – so the impacts are on her. All the rights and privileges I enjoyed as a kid she will no longer enjoy because the state of government policies is that swimmable is unachievable.'[1473]
>
> 'It has a negative impact on our ability to educate our mokopuna on what the customary practices are. That's the impact.'
>
> 'In order to survive, we had to sacrifice some of those customary practices to adopt a foreign cultural practice that was all about having a house, living in a town, having a job to earn money so you could go and buy those things – instead of continuing the practice of hunting or gathering to put a kai on the table. So it's a completely different set of cultural values that has impacted on us, and we haven't recovered from it'
>
> 'It goes beyond that, where our reo me ona tikanga are under threat. We are at the point where we have almost seen the loss of our language and culture. If we lose our reo, we lose that element of our culture and we lose our identity.' Andre Baker, Te Ātiawa ki Whakarongotai.[1474]

Many claimants have lamented the impact on their ability to manaaki visitors to their marae and homes with the local delicacies they have been renowned for providing, including tuna, whitebait, and tohemanga. Also lamented is the impact on their own health and that of their whānau where they are no longer able to gather the kai that once provided a healthy, nutrient-rich diet – or where if available, is often no longer safe to eat. Where kai was once gathered via waka or on foot, it is now purchased via a drive to the supermarket where healthy food options are considerably more expensive, and particularly those that are produced free of chemical intervention.

The loss of this physicality has had a significant impact on physical health, wellbeing, and connectedness.

[1473] Personal communication, Sean Bennett-Ogden, Ngāti Tūkorehe, 18 January 2017.
[1474] Poutama, Spinks, and Raumati, 2016, pp 155-156.

> ‘The physical action of harvesting materials, kai, and rongoā meant our people were constantly active. The building of pā tuna, lifting and carrying nets, harvesting and transporting materials for use on the awa or roto was extremely physical work. Physical work in an area also creates and nurtures the physical connection to a place and space. It should not be under estimated.’[1475]

Others still talked of the impacts of dislocation and disconnection on mental health and spiritual wellbeing, and its wider connection to the health and wellbeing of their waterways:

> ‘Part of the mental health issue is displacement, being displaced from where you come from, who you are.’ Ricki Baker, Ngāti Pare.[1476]

> ‘We’ve had a loss of independence, spiritual wholeness, and a loss of identity.’ Simon Austin, Ngāti Raukawa.[1477]

> ‘If I go back, I remember reading some books about early ethnologists that said amongst the Māori you would not see any mental health. When I think about that and what’s happened from that time to this time, it’s prevalent amongst our people today. Sad to say but it’s a plague amongst us….if we neglect our whenua and our awa there’s some kind of impact that must fall amongst us.’ Rodney Graham, Ngāti Kauwhata.[1478]

The imposition of the Crown’s farming economy over the Māori waterways economy and its subsequent destruction also removed the ability of many whānau, hapū, and iwi in the inquiry district to be materially equipped for life in the coloniser’s ‘little Britain’. Many whānau struggled to afford the medicines and housing once supplied by the resources of their forests and waterways, with their health and life expectancy suffering as a result. While migration to urban towns and cities brought material benefits for some whānau through employment and training and higher education, it also brought with it economic hardship through unemployment and often low-wages (and lower than those paid to Pākehā) – and a host of social problems associated with cultural disconnection and socio-

[1475] Personal communication, Pātaka Moore and Caleb Royal, Te Hono Review Report. Daphne Luke, email received during the Draft Report feedback stage, 4 June 2017.
[1476] Ibid, p 120.
[1477] Ibid, p 28.
[1478] Interview with claimants from Ngāti Kauwhata at TROR, Levin, 2pm, 6 September 2016.

economic disadvantage including crime and imprisonment, addictions, and violence within whānau.[1479]

Others still have talked about the enormous anguish that has accompanied their dealings and negotiations with the Crown and local bodies to restore their waterways, and which has been generations long:

> 'My Grandmother spent a lifetime protesting about the damage to Lake Koputara, Lake Horowhenua, and the Hōkio Stream. Each successive generation has continued the agonising process …. I can't stress enough the pain and grief that we have endured over 150 years at the hands of Crown agents working for local and regional councils, commissioners, chairmen, and lawyers. They are generally patronising, amused, feigning patience and politeness to our faces while ignoring much of what we have to say when they get on with the "real work" of making decisions in favour of their peers…. We are currently - today - engrossed in on-going protest and negotiation. We have collaborated with neighbouring iwi and hapū over many years to protest and express outrage over the state of the Lake and Stream and our neighbourhood. Six generations have now been involved in seeking an intelligent and environmentally sustainable solution to the many issues we face. With every generation the environment is more damaged by the Crown's agents.'[1480]

The extent of the destruction of the waterscape environment and the extent of its impacts have led some to claim that the loss of hapū and iwi rights to waterways has been as significant, or in some respects, more significant than the loss of land.[1481]

8.3 Measuring the Impacts on Wellbeing

This section turns to measure these impacts on the wellbeing of the iwi in the inquiry district using:

- 2013 census data aggregated by iwi;

[1479] R Lange, 2010.
[1480] Personal communication, Rachael Selby, Ngāti Pareraukawa, 3 January 2017.
[1481] See for instance, D Alexander, *Rangitikei River and its Tributaries Historical Report*, Wai 2180 document #A187, November 2015.

- the results of the Te Kupenga survey on Māori wellbeing first conducted by Statistics New Zealand in 2013, also aggregated by iwi; and
- the 2015 District Health Board (DHB) Māori Health Profiles that provide statistics on Māori health and wellbeing, aggregated by regional DHB Māori populations.

While the data sets do not always fit and therefore describe the inquiry district iwi population, they do provide a useful overview of the general wellbeing of the various claimant iwi across a number of measures. Where applicable, these measures are compared with the Treaty partner.

8.3.1 Impacts on Economic Wellbeing

The 2013 census data provided statistics on median income by iwi. The following table presents that data by iwi in the inquiry district.

Table 14: **Personal median income by iwi in the inquiry district.**[1482]

Iwi	Median income
Ngāti Raukawa	$25,000
Ngāti Kauwhata	$20,700
Muaūpoko	$22,600
Te Āti Awa	$28,600
Rangitāne	$23,800
Ngāti Toa	$23,900
Total Māori population	$23,700

The data is not aggregated by Treaty partner, comparing Māori with non-Māori. However, the national personal median income in the 2013 census was $28,500, and the personal median income for those identifying as European was $30,900. The $6,000 earning gap between the national personal median income of $28,500 and the Māori

[1482] http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/iwi-posters-individual.aspx#Manawatū

personal median income of $22,500 was almost twice that in the previous census in 2006.[1483]

In general, members of iwi in the inquiry district had a significantly lower personal median income than the total population and this is more pronounced when comparing with those identifying as European. Of interest, those identifying as iwi (total Māori population in the table above) earned slightly more than those identifying as Māori, which groups those stating iwi affiliations and those identifying more generally as Māori.

The DHB Māori health profiles of the two DHBs relevant to the inquiry district, Capital and Coast and Mid-Central, also provide data on employment rates and income for Māori living in these regions.[1484] Compared with the Treaty partner, Māori were much more likely to be unemployed and live in low-income households.

8.3.2 Impacts on Social Wellbeing

The 2013 census data also provided statistics on formal education qualifications and home ownership by iwi. The following table presents that data by iwi in the inquiry district.

Table 15: **Formal qualifications and home ownership by iwi in the inquiry district.**[1485]

Iwi	Percentage holding formal education qualifications	Percentage of home ownership
Ngāti Raukawa	75.2%	35.4%
Ngāti Kauwhata	67.6%	25.3%
Muaūpoko	71.2%	32.4%
Te Āti Awa	81.5%	40.9%
Rangitāne	72.7%	31.7%
Ngāti Toa	77.4%	33.7%
Total Māori population	68.7%	31.2%

[1483] http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-income.aspx
[1484] http://www.otago.ac.nz/wellington/departments/publichealth/research/erupomare/research/otago147631.html#capital
[1485] http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/iwi-posters-individual.aspx#Manawatū

The data is not also not aggregated by Treaty partner, comparing Māori with non-Māori. However, overall, 79.1 per cent of the total New Zealand population held a formal qualification, which was up from 72.3 per cent in the 2001 census, and up from 75.0 per cent in the 2006 census.[1486] For home ownership, 64.8 per cent of all households owned their own home in 2013, and at a personal level, 56.8 per cent of Europeans owned their own home.[1487]

In general, members of iwi in the inquiry district were less likely to hold a formal qualification than the total population at large. They were also significantly less likely to own their own homes when compared with households overall, where it was, in general, nearly half the national rate, and when compared with those identifying as European.

The DHB Māori health profiles of the two DHBs relevant to the inquiry district, Capital and Coast and Mid-Central, also provide a host of data on education, housing, and health for Māori living in these regions.[1488] Drawing on the health data, and compared with the Treaty partner, Māori were much more likely to have poor health across almost all measures.

8.3.3 Impacts on Cultural Wellbeing

The 2013 census data showed the geographical distribution of iwi from the inquiry district and their percentage of speakers of te reo Māori.[1489]

- For Ngāti Raukawa, of the 15,132 people who identified as Ngāti Raukawa ki te Tonga in the 2013 census, 31 per cent live in the Manawatū-Whanganui region, 26 per cent live in the Wellington region, and 12 per cent in Auckland. The 2013 census also reported that 23 per cent of people from Ngāti Raukawa ki te Tonga could hold a conversation in te reo Māori.
- For Ngāti Kauwhata, of the 1,401 people who identified as Ngāti Kauwhata in the 2013 census, 58.7 per cent live in the Manawatū-Whanganui region, 9.2 per cent live in the Wellington region, and 7.9 per cent in Auckland. The 2013 census also

1486 http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/qstats-education-training.aspx
1487 http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-about-housing.aspx
1488 http://www.otago.ac.nz/wellington/departments/publichealth/research/erupomare/research/otago147631.html#capital.
1489 http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/iwi-posters-individual.aspx#Manawatū

reported that 35.8 per cent of people from Ngāti Kauwhata could hold a conversation in te reo Māori.

- For Muaūpoko, of the 2,691 people who identified as Muaūpoko in the 2013 census, 43.7 per cent live in the Manawatū-Whanganui region, 17.9 per cent live in Wellington, and 9.6 per cent in Auckland. The 2013 census also reported that 23.5 per cent of people from Muaūpoko could hold a conversation in te reo Māori.
- For Te Āti Awa, of the 2,556 people who identified as Te Āti Awa in the 2013 census, 51.8 per cent live in the Wellington region, 10.4 per cent live in Auckland, and 9.9 per cent in the Manawatū-Whanganui region. The 2013 census also reported that 19 per cent of people from Te Āti Awa could hold a conversation in te reo Māori.
- For Rangitāne, of the 1,488 who identified as Rangitāne in the 2013 census, 50 per cent live in the Manawatū-Whanganui region, 14 per cent live in the Wellington region, and 8 per cent in Auckland. The 2013 census also reported that 26.5 per cent of people from Rangitāne could hold a conversation in te reo Māori.
- For Ngāti Toa, of the 4,458 who identified as Ngāti Toa in the 2013 census, 45 per cent live in the Wellington region, 10.5 per cent live in the Waikato, and 10.2 per cent in the Manawatū-Whanganui region. The 2013 census also reported that 26 per cent of people from Ngāti Toa could hold a conversation in te reo Māori.

From this data, it seems, in general, that there was a correlation between living in one's iwi rohe and being able to hold a conversation in te reo Māori.

The Te Kupenga survey of Māori wellbeing, also conducted in 2013, gives more detailed data on measures such as cultural connectedness and te reo Māori but is less precise in describing the cultural wellbeing of the iwi in the inquiry district. Two of the iwi data sets relate to the iwi of the inquiry district – Ngāti Raukawa and Te Āti Awa.[1490] Data collated for Ngāti Raukawa included those who specified Ngāti Raukawa (Waikato), Ngāti Raukawa (Horowhenua/Manawatū), Ngāti Raukawa (unspecified), or Ngāti Kauwhata as their iwi or one of several iwi. Data collated for Te Āti Awa included those who specified Te Ā ti Awa (Taranaki), Te Ā ti Awa (Te Whanganui-a-Tara), Te Ā ti Awa ki

[1490] See the excel tables at, http://www.stats.govt.nz/browse_for_stats/people_and_communities/Māori/iwi-tables-tekupenga13-eng.aspx

Whakarongotai, Te Āti Awa (Te Wai Pounamu), or Te Āti Awa (region unspecified) as their iwi or one of several iwi.

- Key findings for Ngāti Raukawa:

  Cultural connectedness: Nearly 60 per cent felt it was important to be engaged in Māori culture; just over 20 per cent felt it was somewhat important; and just over 20 per cent felt it was not important. In terms of connectedness to marae, 64 per cent felt strongly connected, 28 per cent felt somewhat connected, and 8 per cent said they were not connected.

  Te reo Māori: For 7.7 per cent, te reo Māori was their first language learned and still understood. Further to this, 12 per cent were able to speak te reo Māori well or very well, and 19 per cent were able to understand te reo Māori well or very well; 14 per cent were able to speak fairly well and 21 per cent were able to understand fairly well; and 75 per cent were not able to speak very well or not more than a few words or phrases, and 61 per cent were not able to understand very well or not more than a few words or phrases.

- Key findings for Te Āti Awa:

  Cultural connectedness: Just over 40 per cent felt it was important to be engaged in Māori culture; 23 per cent felt it was somewhat important; and 36 per cent felt it was not important. In terms of connectedness to marae, 57 per cent felt strongly connected, 29 per cent felt somewhat connected, and 14 per cent said they were not connected.

  Te reo Māori: For 4 per cent, te reo Māori was their first language learned and still understood. Further to this, 4 per cent were able to speak te reo Māori well or very well, and 12 per cent were able to understand te reo Māori well or very well; 9 per cent were able to speak fairly well and 20 per cent were able to understand fairly well; and 84 per cent were not able to speak very well or not more than a few words or phrases, and 69 per cent were not able to understand very well or not more than a few words or phrases.

8.3.4 Impacts on Spiritual Wellbeing

The Te Kupenga survey of Māori wellbeing also reported on the importance of spirituality in respondent's lives.[1491] From the two iwi data sets relevant to the inquiry district, Ngāti Raukawa and Te Āti Awa, the results were:

- Ngāti Raukawa

  Importance of spirituality: For 56 per cent, spirituality was important; for 18 per cent it was somewhat important; and for 27 per cent it was not important.

- Te Āti Awa:

  Importance of spirituality: For 49 per cent, spirituality was important; for 19 per cent it was somewhat important; and for 32 per cent it was not important.

The DHB Māori health profiles of the two DHBs relevant to the inquiry district, Capital and Coast and Mid-Central, also provide data on mental health disorders.[1492] Compared with the Treaty partner, both rangatahi and pakeke Māori were significantly more likely to have poor mental health.

8.3.5 Summary of Impacts on Wellbeing

Collectively, the statistical measures presented above paint a picture of the multitude of impacts on hapū and iwi in the inquiry district that have arisen alongside the degradation and pollution of their waterways, and clearly support the evidence provided by claimants as outlined in section 8.2. Measured against a time when hapū and iwi were in full possession of their lands and waterways, where they lived in a pristine and abundant waterscape that provided an inclusive economy and a high standard of material and spiritual wellbeing, and where cultural connectedness and te reo Māori was the norm, the statistics of today show just how devastating and wide-reaching the Crown's near destruction of waterways has been. They poignantly illustrate the connection between the mauri and wellbeing of waterways and people that is central in a Māori worldview.

Opening up the inquiry district for farming and settlement has clearly not been beneficial for the hapū and iwi claimants, and nor has it "outweighed" the disadvantages associated

[1491] See the excel tables at, http://www.stats.govt.nz/browse_for_stats/people_and_communities/Māori/iwi-tables-tekupenga13-eng.aspx.

[1492] http://www.otago.ac.nz/wellington/departments/publichealth/research/erupomare/research/otago147631.html#capital.

with the loss of lands and waters as claimed in the late 1900s,[1493] and indeed still claimed in some quarters today. Instead, the statistics clearly show the socio-economic advantages accrued to the Treaty partner as a result of the Crown's actions to privilege their own vision for the inquiry district, and the higher standard of living and wellbeing that they experience as a consequence.

Hapū and iwi, however, continue to have their own vision for the inquiry district – and one that has focused on the revitalisation of the mauri and wellbeing of their waterways and their people.

8.4 Revitalisation of Hapū and Iwi Wellbeing

As noted by Rachael Selby of Ngāti Pareraukawa, the cost of 150 years of poor Crown and council decision-making has been degraded and polluted waterways – which consequently drove her hapū away from the Hōkio environment into foreign suburban and urban environments 'to accept that we are powerless' and with the 'belief that Māori would not survive' and had to instead 'become Pākehā' to survive.[1494] In addition to maintaining their inter-generational fight to restore their waterways, Ngāti Pareraukawa have also sought to restore themselves.

> 'For the past 40 years we have attempted to retrieve the values and beliefs of our tūpuna, to make the marae our principal home again, to focus on building our people as Ngāti Pareraukawa again, to revitalise te reo and take control of our ways of living.'[1495]

Thus a significant project for the revitalisation of hapū and iwi wellbeing has been Whakatupuranga Reo Mano, Generation 2000 – an "experiment in tribal development" conceived in 1975 by the ART confederation of three iwi in the inquiry district, Te Ātiawa, Ngāti Raukawa, and Ngāti Toa Rangatira. The aim of the project was to draw on their traditional alliances and collectively prepare their people for the 21st century, and had two main approaches to achieve this aim: to increase awareness of their culture, principally by increasing the number of speakers of te reo Māori and by drawing together

[1493] R Lange, *The Social Impact of Colonisation and Land Loss on Iwi of the Rangitikei, Manawatū, and Horowhenua Region 1840-1960* (Wellington: Crown Forestry Rental Trust, 2010), pp 69-70.
[1494] Personal communication, Rachael Selby, Ngāti Pareraukawa, 3 January 2017.
[1495] Ibid.

and expanding their mātauranga tuku iho; and to encourage the attainment of higher education.[1496]

A key development from the experiment was the establishment of Te Wānanga o Raukawa in 1981, whose principal purpose and focus has been to maximise its contribution to the survival of Māori as a people – expressed in their foundational statement, *E kore au e ngaro, he kakano i ruia mai i Rangiatea*.[1497] The wānanga has been described as "a vital exercise of rangatiratanga" by the Waitangi Tribunal,[1498] and has developed a unique programme of qualifications to achieve that purpose.

Alongside the establishment of the wānanga has been the construction of new marae, and the development of kōhanga reo, kura kaupapa Māori, and wharekura. Whakatupuranga Rua Mano has been instrumental in rejuvenating hapū and iwi connectedness and wellbeing, giving them "new life and purpose".[1499]

The development of further kōhanga reo, kura kaupapa Māori, and wharekura in the inquiry district have followed, along with further iwi-led providers of tertiary education including the Kōkiri Centre in Levin run by Patumakuku Incorporated, and Te Wānanga o Awanui-a-rangi and Te Wānanga o Aotearoa. Iwi-led health and social services providers and initiatives have also been developed, and a number of programmes focused on whānau, hapū, and iwi wellbeing.

8.5 Revitalisation of Inland Waterways

The revitalisation of hapū and iwi connectedness in the inquiry district has also led to a plethora of marae-, hapū-, and iwi-led research and community action projects centred on the revitalisation of their inland waterways and the restoration of indigenous aquatic fish and plant species and of kaimoana in the coastal marine area, reasserting their role as kaitiaki and drawing upon and further developing their mātauranga in freshwater management.

[1496] W Winiata, 'Whakatupuranga Rua Mano, Generation 2000: An Experiment in Tribal Development', in *He Matapuna: Some Māori Perspectives* (Wellington: New Zealand Planning Council, 1978).
[1497] W Winiata, *Te Wānanga o Raukawa: What is a Wānanga?* (Ōtaki: Te Wānanga o Raukawa, 2005).
[1498] Waitangi Tribunal, *The Wānanga Capital Establishment Report: Wai 718 Waitangi Tribunal Report* (Wellington: GP Publications, 1999), p 48.
[1499] P Winiata, *Whakatupuranga Rua Mano – Generation 2000: A Case Study*, paper presented at Leaders Are Made Not Just Born, Planning for Leaders and Leadership Succession (undated).

As outlined, in the main, in the inland waterways cultural perspectives report,[1500] these have included:

- Numerous Hui Rangitahi that have involved planting at the Waikanae estuary and along the Waikanae River in conjunction with 'Friends of the Waikanae River' and the Department of Conservation. Te Ātiawa ki Whakarongotai Charitable Trust are also to co-lead a Mountains to Sea Waikanae Restoration Project with the Department of Conservation, and with the involvement of other agencies;
- The rehabilitation projects of Hapai Whenua Consultants, a kaupapa Māori environmental research team based in Ōtaki, including: the Mangapouri Stream health assessment in Ōtaki according to Māori values; their extensive oral archiving work of customary use relationships with the Waitohu River, Waikawa River, and Ōhau River; their regular shellfish and water quality health reports completed for Horizons Regional Council; and their work against the destruction of the health of the Hōkio Stream and the Manawatū River;
- Lake Waiorongomai 10 Trust and Nga Ngā Hapū o Ōtaki and the Lake Waiorongomai restoration programme which began in 2012, supported by the whānau and hapū of neighbouring land blocks, including Ngāti Maiotaki, Ngāti Waihurihia, and Ngāti Moewaka;
- The involvement of kura kaupapa Māori students in inland waterways revitalisation projects in Ōtaki, including from Te Kura-a-iwi o Whakatupuranga Rua Mano and Te Kura Kaupapa Māori o Te Rito;
- The Te Hakari wetlands restoration project started by Ngāti Tūkorehe in the late 1990s;
- The Manaaki Taha Moana project from 2009-2015 that investigated ecological decline issues for freshwater systems out to the coastal marine area between Hōkio Beach and Levin, and out of which developed a number of further revitalisation projects – including in relation to Lake Papaitonga/Lake Waiwiri and the Waiwiri Stream; the Kuku/Ōhau River estuary; the lower reaches of the Ōhau River; and the coastal wetlands between Kuku to Waikawa; and in relation to land and water use impacts on the abundance and health of shellfish between

[1500] H Smith, forthcoming.

Hōkio and Ōtaki.[1501]

- The Muaūpoko Tribal Authority action plan of 2011-2014 that called for decline in sediments and pollutants impacting on the Hōkio Stream, and for habitat protection and enhancement initiatives;[1502]
- The Lake Koputara restoration project led by the Lake Koputara Trust;
- The Save Our River Trust led by marae in the Foxton area to re-open and restore the Foxton Loop of the Manawatū River;
- The efforts of Ngāti Whakatere and Taiao Raukawa Environmental Resource Unit to restore the Tokomaru River, including via initiatives such as the 2014 Tokomaru River Hīkoi, and small- and large-scale plantings of native trees along the river – along with Rangitāne representatives, local Tokomaru community members, surround hapū, farmers, and with the assistance of local and regional government entities;
- The work of iwi representatives from Rangitāne, Ngāti Whakatere, Ngāti Kauwhata, Ngāti Raukawa, and Muaūpoko on the Manawatū River Leaders Accord's to restore the Manawatū River and its tributaries, including the Tokomaru River, to good health;[1503]
- The Rangitāne-led Tū Te Manawa project to enhance iwi involvement in the restoration of the Manawatū River;[1504]
- The collaborative Integrated Freshwater Solutions project with iwi and Massey University which included: the Ngāti Kauwhata water quality and

[1501] See for instance, C Allen, J Sinner, J Banks, and K Doehring K, *Waiwiri Stream: Sources of Poor Water Quality and Impacts on the Coastal Environment*. Manaaki Taha Moana Research Report No.9. Cawthron Report No. 2240, 2012; E Newcombe, M Poutama, C Allen, H Smith, D Clark, J Atalah, A Spinks, J Ellis, and J Sinner, *Kaimoana on beaches from Hōkio to Ōtaki, Horowhenua.* Manaaki Taha Moana Research Report No. 22. Cawthron Report No. 2564, 2014; E Newcombe, H Smith, M Poutama, D Clark, A Spinks, J Ellis, and J Sinner, *Faecal contamination of shellfish on the Horowhenua coast.* Prepared for Taiao Raukawa and Manaaki Taha Moana. Manaaki Taha Moana Research Report No. 23. Cawthron Report No. 2573, 2014; H Smith, A Spinks, T Hoskins, and M Poutama, *State of Ecological/Cultural Landscape Decline of Horowhenua Coastline Between Hōkio and Waitohu Streams: Manaaki Taha Moana Research Report No. 2*, (Palmerston North: Massey University, 2011); and H Smith, A Spinks, and M Poutama, *He Tirohanga Whānui: An Overview of Ecosystems Undergoing Rehabilitation in Manaaki Taha Moana, Horowhenua Case Study: Manaaki Taha Moana Research Project Report No. 19*, (Palmerston North: Massey University / Ōtaki: Taiao Raukawa Environmental Resource Unit, 2014).

[1502] See http://www.massey.ac.nz/massey/learning/departments/centres-research/eernz/integrated-freshwater-solutions/about-the-project/muaupoko-coastal-research-project-2011-2014/muaupoko-coastal-research-project-2011-2014.

[1503] See http://www.Manawatūriver.co.nz/

[1504] See http://www.stuff.co.nz/Manawatū-standard/news/85594459/Iwi-lead-project-to-improve-the-mauri-of-the-Manawatū-River.

macroinvertebrate monitoring on the Oroua River that ran from 2010-2013;[1505] the development of the Rangitāne o Manawatū River Co-management Research Plan; and the Muaūpoko Coastal Research Project which ran from 2011-2014; and

- Ngāti Kauwhata and the development of the Oroua River Declaration which was co-signed with the Manawatū District Council in December 2015.[1506]

However, as the findings of this report have made clear, there is much more still to be done. Much more investment is needed by the Crown to further develop the mātauranga of hapū and iwi and Māori freshwater science. Much more is also needed to strengthen the Crown's and council's recognition of and respect for the tino rangātiratanga of hapū and iwi over their inland waterways and their role as kaitiaki in freshwater management – and to strengthen this beyond arrangements based on the 'good-will' of elected councillors.

[1505] See http://www.massey.ac.nz/massey/learning/departments/centres-research/eernz/integrated-freshwater-solutions/integrated-freshwater-solutions.

[1506] Ngāti Kauwhata and Manawatū District Council, *Oroua River Declaration* (2015).

Figure 53: **Poster from the Tū Te Manawa Project.**

8.6 Concluding Remarks

The oral evidence of claimants and the analysis of statistical measures of iwi wellbeing together provide extremely compelling evidence that the devastation of the inquiry district's inland waterways has affected a corresponding devastation on the wellbeing of hapū and iwi. The impacts on their wellbeing have been profoundly experienced on all fronts – economically, socially, culturally, physically, mentally, and spiritually. These impacts have been experienced across multiple generations and have greatly affected the inter-generational transmission of mātauranga, tikanga, and te reo Māori. Indeed, these impacts have compounded over the generations as waterways have continued to be destroyed, degraded, and polluted by and through a host of Crown actions and inactions as detailed in the previous chapters of this report. Claimants are currently very uncertain about what will be left of their waterways, freshwater resources, and associated sites of significance for future generations. Given the findings of Chapter 6 where water quality can be expected to decline for decades to come, their fears are clearly justified.

Hapū and iwi in the inquiry district have, however, sought to mediate the impacts of Crown failures to affirm and uphold their tino rangatiratanga over themselves and their inland waterways and assert their mana and rangatiratanga. This is evidenced by the multiplicity of projects and initiatives undertaken by hapū and iwi to restore and revitalize the mauri and wellbeing of both their own people and of their taonga waterways. Of particular note has been the 'experiment in tribal development', Whakatupuranga Rua Mano, initiated by the ART confederation of Te Āti Awa, Ngāti Raukawa, and Ngāti Toa Rangatira in the mid-1970s, to rebuild their people's connections to their marae and grow the storehouse of te reo Māori speakers and mātauranga tuku iho. The numerous marae-, hapū-, and iwi-led waterways restoration projects initiated in the inquiry district, have also been exercises in rebuilding and reinvigorating their rangatiratanga and role as kaitiaki and the associated mātauranga and its transmission.

What is very clear from this report, however, is that much more needs to be done to restore the previous health of the inquiry district's inland waterways. This includes the need for significant changes to be made within local government agencies to affect a restoration of the rights and powers of hapū and iwi as kaitiaki of their waterways, and full recognition of their rangatiratanga through which kaitiakitanga is effectively exercised.

9. REPORT SUMMARY

The following is a summary of the report chapter's concluding remarks:

Title and Ownership:

- The Crown has failed to uphold their guarantee of maintaining the rangatiratanga of hapū and iwi in the inquiry district over their inland waterways.
- Instead, the Crown legislated for the near wholesale transfer of hapū and iwi lands and associated waterways into private hands to support the development of pasture lands for farming and to support ongoing settlement. This has left many hapū and iwi with limited or no access to their taonga waterways, and with limited ability to learn and pass on important tikanga and mātauranga associated with these waterways.
- The transfer of lands and waterways in the inquiry district has also left many waterways degraded and polluted and unable to support the former abundance of aquatic life. In some cases these waterways are no longer in existence.
- Where hapū and iwi have been able to retain a degree of ownership, degradation has been less severe.
- Despite Crown failures, hapū and iwi in the inquiry district continue to assert their rangatiratanga of their inland waterways and to give expression to this as kaitiaki to maintain them into the future.

Flood Control and Gravel Extraction:

- Large-scale deforestation and drainage of wetlands to create pasture lands for farming exacerbated flooding in the already flood-prone inquiry district.
- The removal of wetlands through drainage schemes also removed or significantly reduced the food and other resources they contained which were highly valued by hapū and iwi, and which formed much of the basis of their economy.
- In response to exacerbated flood events, a number of flood control mechanisms have been undertaken by local authorities – including further drainage schemes, and modifications such as stopbanks, floodway and sluice gate schemes, and the straightening of rivers.
- The purpose of river control mechanisms has been to protect townships or provide for their expansion and to protect commercially valuable farm lands from

flooding, but have consistently failed to protect Māori customary rights and interests. They have been undertaken without any involvement or consultation with hapū and iwi, and as a consequence, have resulted in the further taking of Māori land and have caused further damage to the food stocks of waterways used by hapū and iwi and also to their sites of significance such as urupā.

- Gravel extraction as a particular mechanism of flood control has again resulted in the further taking of Māori land, particularly as gravel became an important industry in the inquiry district. Local authorities have continued to extract gravel from many of the major rivers in the district – often without consultation with Māori as mana whenua and, in the main, without compensation to Māori landowners.
- Except in some instances in the late 1800s, it would appear the no hapū or iwi has derived any financial benefit from gravel extraction despite its development into a multi-million dollar private industry.

Water Use:

- Water abstraction from rivers and streams across the inquiry district has continued to increase over the past 150 years, with the vast majority of it used for irrigation for farming and horticulture. Demand for water has now outstripped supply in most catchments where permits for water take are over-allocated.
- Despite awareness that increased abstraction reduces the capacity of rivers and streams to dilute the waste discharged to it, the Crown remains committed to further increasing abstraction to further intensify and expand farming and horticulture in the inquiry district. Groundwater is increasingly being used as a water source for these developments, but is insufficiently regulated and monitored in at least some parts of the inquiry district.
- Despite the passage of numerous pieces of legislation regulating both water take and the discharge of waste to waterways over the past 150 years, there has been insufficient regard for the environmental consequences on water quality and the aquatic life that rivers and streams support. Instead, Crown-authored management and regulatory regimes have consistently usurped environmental interests for the economic interests of the farming and horticultural sectors.
- In particular, there has also been very little regard for the impacts of water take and discharge on the customary use of these waterways by hapū and iwi. As a

result, the imposition of the Crown's regime has obliterated the waterways-based economy and way of life of hapū and iwi in the inquiry district.

- The Crown has failed in their obligation to uphold and protect the customary use of waterways by hapū and iwi as partners to Te Tiriti o Waitangi. Instead, their interests have been continually marginalised or, at best, "taken into consideration" as one "stakeholder" interest group alongside others.
- Where hapū and iwi campaigns for the recognition of their customary use rights have been upheld by Crown-delegated local authorities it would seem to be more a result of economic-based decision-making than any honouring of these obligations.

Resource Management:

- Studying the effects of resource management of water has been a complex undertaking. When looking at resource management of land, the focus is typically limited to land use and property rights associated to it. Studying the relationship between water and humans is very different; by nature water is a dynamic, renewable, flow resource. In any given distinct geographical space, the form water takes, its volume, its character, its purpose, can be in a constant change of flux over time. This means that we cannot just be concerned with the use or treatment of water itself, but also have to address the effects of Crown resource management on the larger geomorphological, hydrological, ecological, economic and socio-cultural processes which determine where water is on the landscape, how much of it there is, how quickly it flows, the quality of it, across different points in time.
- The effects of poor management of water are also complex to analyse in that their spatial and temporal distribution may extend greatly beyond the time and place that the initial impact occurred. This is evidenced through the number of issues around freshwater quality and availability that are being experienced today by claimants, which can be attributed to political and resource management decisions made over 150 years ago, and often outside their hapū or even iwi boundaries. The effects of deforestation in the mid-1800s in the upper Manawatū catchment, has some relation to the toxicity of shellfish that the people Kāpiti Coast region are aggrieved about today. It is extremely challenging to capture all these drivers of

degradation and how they relate to one another over a large, once ecologically diverse, area.

- Crown resource management of water doesn't consist of a few discrete incidences of impact, but rather can be described as a regime of removing the natural cleansing systems from the waterscape in favour of certain industries that were highly polluting to inland waterways, followed by a systemic failure to manage their pervasive, cumulative, and ultimately devastating effects, which have been continuously denied.

Water Quality:

- Analysis has shown that the Crown has comprehensively failed to protect the health of inland waterways in the inquiry district which has had a major impact on their life-supporting capacity and thus their use by hapū and iwi as a key source of food, fibre, and medicine; as the basis of their economy; and as sites for spiritual cleansing and rejuvenation.
- The implementation of the Resource Management Act has not halted the degradation. If anything, it appears to be contributing to it, as significant impacts on water quality through sedimentation, and diffuse nutrient and pathogen pollution are being ignored. Ignoring these impacts, the majority of which result from agricultural intensification in particular, has allowed increased degradation of lowland lakes and rivers, as well as many aquifers, estuaries, and harbours.
- Freshwater management approaches undertaken by the Crown have patently failed to protect ecosystem health and fish habitats. Over time the failure has led to local species extinction and unless significant changes are made, and made soon, it is apparent that we will have more species on the threatened list.
- The Crown's National Policy Statement on Freshwater and National Objectives Framework are not backed up by meaningful water quality limits, and in most cases the bottom lines they set are much weaker than the guidelines they replace. This is exacerbated by the fact that, under this policy framework, the wrong things are measured the wrong way. Furthermore, the fact that the regional councils are not required to fully implement the policy framework until 2030 means that there will be no potential for any net improvement in water quality for many years, at best.

- In this environment, lowland lake ecosystems in New Zealand have already passed ecological tipping points. Estuaries and harbours at the end of catchments are under severe pressure with ocean fish nursery areas such as eel grass beds lost from most New Zealand harbours and estuaries, which is, in turn, having major impacts on ocean fisheries. Riverine ecosystems in lowland reaches in intensive pasture catchments regularly pass tipping points with sediment and nutrient impacts.
- Tipping points are hard to predict but it is clear that many lakes and harbours in New Zealand have passed the point of no return, at least for decades or longer. Rivers are relatively easier to pull back from tipping but given the lag times for sediment and nutrient impacts, all else being equal, many rivers can be expected to decline for decades to come. Given the lag times for nutrients and sediment from past land use change and intensification of farming in the last few decades, it is likely that freshwater ecosystems will continue to decline and more will tip into a worse state.
- The effects of all of this degradation on aquifers and groundwater are more difficult to know at this point, due to difficulties in scientifically measuring, but it is not likely to be positive.

Fisheries and Wetlands:

- There have been three main processes by which the Crown reduced the availability of crucial inland waterway resources and the fishes in them.
    - The first was the consequence of the purchase of land by the Crown and settlers, whereby they controlled vast stretches of land alongside waterways, and thus, controlled access to these waterways.
    - The second was the fundamental freshwater community changes brought about by the introduction of exotic fish species, and the initial actions of the organisations representing these fish wanting to remove tuna because of perceived impacts on the introduced fish.
    - Third was the degradation of waterways permitted and encouraged by the Crown, through a multitude of changes brought about by vegetation clearance, wetland drainage, building towns near rivers so that stop banking is required, and permitting the discharging of municipal and

industrial waste into rivers and lakes. More recently, the Crown has failed to protect freshwaters by allowing unlimited intensification of agriculture with consequent impacts on water quality.

- Numerous examples from throughout the inquiry district demonstrate the failure of the Crown to protect healthy freshwater ecosystems and the fisheries they supported where the failings are most obvious at the landscape scale change.
- The extent of landscape and land use change in the inquiry district since colonisation has been immense. Nearly all natural vegetation habitat types have been reduced, 94 per cent of the natural vegetation was removed and in most cases replaced with pasture. Wetlands previously dominated the lowland landscapes especially in the northern half of the inquiry district, and now 88 per cent of these have been removed – drained or covered over, and the remaining wetlands are in a poor state.
- The value of these lost wetlands is immense and using their ecosystem services value to indicate this in dollar terms the loss is somewhere between $7.0 and 8.6 billion.
- The loss of habitats for fish can also allow for the assessment of the fisheries value and biomass lost. This assessment revealed that somewhere between 9,800 and 180,000 tonnes of tuna have been lost.
- The draining of wetlands and forest clearance has had profound impacts on the value of the natural landscape in the inquiry district to Māori in many ways including the direct loss of habitat as well as the erosion of habitat quality for fish and birds. After initial destruction of habitat in the early colonial period, the damage continues to this day through Crown or private development schemes on rivers and lakes including sewage discharges, farming intensification, and water abstraction.
- The loss of habitat for fish has occurred on multiple fronts; through the actual physical loss of and degradation of waterways and wetlands, and through the loss of access to remaining waterways.

Hapū and Iwi Wellbeing:

- The oral evidence of claimants and the analysis of statistical measures of iwi wellbeing together provide extremely compelling evidence that the devastation of

the inquiry district's inland waterways has affected a corresponding devastation on the wellbeing of hapū and iwi. The impacts on their wellbeing have been profoundly experienced on all fronts – economically, socially, culturally, and spiritually.

- These impacts have been experienced across multiple generations and have greatly affected the inter-generational transmission of mātauranga, tikanga, and te reo Māori.
- These impacts have compounded over the generations as waterways have continued to be destroyed, degraded, and polluted by and through Crown failures. Claimants are currently very uncertain about what will be left of their waterways, freshwater resources, and associated sites of significance for future generations.
- Hapū and iwi in the inquiry district have, however, sought to mediate the impacts of Crown failures to affirm and uphold their tino rangatiratanga over themselves and their inland waterways. This is evidenced by the multiplicity of projects and initiatives undertaken by hapū and iwi to restore and revitalize the mauri and wellbeing of both their own people and of their taonga waterways.
- Of particular note has been the 'experiment in tribal development', Whakatupuranga Rua Mano, initiated by the ART confederation of Te Āti Awa, Ngāti Raukawa, and Ngāti Toa Rangatira in the mid-1970s, to rebuild their people's connections to their marae and grow the storehouse of te reo Māori speakers and mātauranga tuku iho.
- The numerous marae-, hapū-, and iwi-led waterways restoration projects initiated in the inquiry district, have also been exercises in rebuilding and reinvigorating their role as kaitiaki and the associated mātauranga and its transmission.
- Much more needs to be done to restore the previous health of the inquiry district's inland waterways. This includes the need for significant changes to be made within local government agencies to affect a restoration of the rights and powers of hapū and iwi as kaitiaki of their waterways.

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V.P. McGlone, Commissioner of Crown Lands, 1 June 1966.	R22967490.	H_3_25
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A. Plank, Secretary for Internal Affairs, Department of Internal Affairs, 19 June	R22967490.	H_3_27

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Te Reo letter from Riria te Huruhuru and others to Acting Prime Minister re Te Whakapuni and other land.	R22409665 – From: Hiria Te Huruhuru, Hone Reweti and others – Subject: Te Wharangi, Te Whakapuni and Marupapaka Reserves from Sale of Manawatū Block. For return of lands to descendants of original owners, MAI99, Record 1909/600.	H_3_31
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Evidence of communication and documentation about the drain that was cut from Lake Whakapuni to the river,	R3951187 Wellington Land District – Whitebaiting – Whakapuni	H_3_33

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and the impact of this on whitebaiting.	Drain – Manawatū River – Cutting of Drain from Whakapuni Lake to River. Reference ABWN W5021 6095 Box 631, Record 22/5127.	
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Letter of 20 October 1927, from the Commissioner of Crown Lands, to the Under-Secretary for Lands in the matter of the abovementioned Petition No. 260 of 1927 regarding Whakapuni Lake.	R22420343.	H_3_40
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G.D. Turnbull Deparment of Māori Affairs Memorandum 11 April 1949.	R21530230. Waiorongomai Block: Horowhenua County. Lake Waiorongomai – Ōtaki –	H_3_43

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File Description	File #	IWHIS #
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Takerei Wi Kohika, Moutoa, Letter to the Minister of Māori Affairs, 21 March 1930.	R22411673. Subject: Tapunga No. 69 – complaint that Manawatū-Oroua River Board intends to cut a channel through the land and threaten the Cemetery on Wakawehi 113 with erosion, 1930.	H_3_51
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Correspondence from the Ministry of Works to the Chief Accountant of the Department of Internal Affairs, dated 7 May 1953, regarding a Commission of Enquiry about the Whirokino Cut.	R14987967, IA1 2017, 66/41. Servicing of Government Commission, Whirokino Cut Expenses.	H_3_57

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Outline of fees and allowances paid to members of the Commission.	R14987967, IA1 2017, 66/41. Servicing of Government Commission, Whirokino Cut Expenses.	H_3_59
Correspondence between the Commissioner of Crown Lands and the Manawatū County Council regarding the removal of gravel from the Oroua River Bed in 1903, letter dated 18 August 1903.	R24011044, LS-W1 422, Record 23140. Commissioner of Crown Lands – Gravel from Oroua River Bed.	H_3_60
Letter from the Chief Surveyer to the Surveyor General regarding the Levin Water Race, 25 March 1902.	R24007373, Horowhenua No. 6 Block, LS-W1 380, Record 19345/4.	H_3_61
Picture of the proposed Levin Water Race.	R24007373 Horowhenua No. 6 Block, LS-W1 380, Record 19345/4.	H_3_62
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M Baker, Returned Rates Demands, 20 August 1953	Box 6/17, Folder 159, #21	H_6_2
Ian Macmillan & Co, letter to the Town Clerk, Ōtaki Borough Council, 12 December 1961.	Box 6/53, Folder 351	H_6_3
Ōtaki Borough Council, letter to the Horowhenua Electric Power Board, 23 September 1982.	Box 7/46 and 7/47, Folder G9	H_6_4
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Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho, Site Visits from Tūkorehe Marae to Surrounding Areas, Wai 2200, #4.1.8(a), 23-24 June 2014.

Waitangi Tribunal, Porirua Ki Manawatū Inquiry District Ngā Kōrero Tuku Iho Hui, Whakarongotai Marae, Waikanae, Wai 2200, #4.1.10, 22 April 2015.

APPENDICES

Appendix I: Ngāti Raukawa ki te Tonga Inland Waterways of Significance and their Cultural Values

Significant inland waterways	Values
Rangitikei River	Baptismal, tohi, kai/food source, ancestral travelling stream, swimming, nourishes whenua
Rangitikei Tributary - Mahakikaroa	He waiora, wai whangai, eeling, fishing
Rangitikei Tributary - Makōwhai	Pātaka kai species (tuna/eels, kākahi/freshwater mussel, kōura/freshwater crayfish, watercress), swimming, bathing
Karariki	
Rangitawa stream	Historical/ancestral pā (e.g. Miria te Kakara)
Waitohi	
Kaikōkopu Dune Lakes	
Turakina River	
Rātana Wetlands	
Kairanga Wetlands	
Mangahao	Kōura/freshwater crayfish, past time for the tamariki
Rongotea Wetlands	Waterfowl
Waitapu stream	Glow worms, Tawhirihoe scenic reserve (white caprosma, katipo spider, pheasant bird)
Waituna stream	Tuna/eels
Pourewa	
Harurunui puna	Taniwha, collection of watercress
Kaputara Lake	Mahinga kai (tuna/eels, kākahi/freshwater mussels, rakiraki/ducks), harakeke for weaving, tī kouka for rongoā, weaving and kai

Significant inland waterways	Values
Manawatū River	Pa (Te Ahitara Pa, Moutoa Pa, Puketotara), papakāinga (Te Maire Kāinga o Manawatū, Otini, Tokomaru kāinga, Tutunanui kāinga, Whirokino kāinga, Pakingahau), Waiora, waimate, swimming, eeling, fishing (kōkopu/native trout, kahawai, grey mullet, flounder), kayaking, whitebait, he wāhi whakawhānaunga), Papangaio, Peketahi kōura & ika.
Historical note from hapū and iwi representatives at the Mapping Sites of Significance Wānanga on 28 May 2016. The Manawatū River commences at the junction of the Tokomaru River and Oroua River. Hence the Manawatū River is only from the Oroua River to the sea. Prior to that the river was historically called the Tokomaru River.	
Tokomaru River	Mahinga kai (kākahi, whitebait, watercress, fish, eeling, ducks, kānga pirau), swimming.
Manawatū Estuary	Customary fisheries/mahinga kai: abundance of kai species (kahawai, mullet, lemon fish, grey mullet, eels, whitebait, herrings, toheroa or tohemanga, pipi, cockles, tua tua, kuaka, variety of manu, and seagull eggs); harakeke; flesh eating snail
Manawatū Tributary - Awahou	
Manawatū Tributary - Oroua River	Swimming
Manawatū Tributary - Oroua River Hoununi Spring	eels, native fish, waterfowl, freshwater mussels, freshwater crayfish
Manawatū Tributary - Oroua River, northern wetlands	eels, native fish, waterfowl, freshwater mussels, freshwater crayfish
Manawatū Tributary - Oroua River, Ahuatanga Taonui Wetlands near Feilding	eels, native fish, waterfowl, freshwater mussels, freshwater crayfish
Manawatū Tributary - Tokomaru	Swimming, whānau gathering, ngā wāhi "free" mō

Significant inland waterways	Values
Stream/Makarua River	ngā whānau o Ngāti Whakatere ki te whakawhānaunga, takano he wāhi kai hoki
Makurerua/Makarua Wetlands/Makerua Swamp	
Manawatū Tributary - Mangaore Stream	Mahinga kai (trout, eels), swimming, recreation (rafting), tourism
Manawatū Tributary - Ōtauru then Mangaore tributary - Pohatu stream	Freshwater crayfish
Manawatū Tributary - Pohangina River	
Manawatū Tributary - Tokanui/Otauru Stream	Wāhi karakia, wāhi whakanoa, wāhi whakawatea, Mahinga kai (trout, eels, freshwater crayfish, access to watercress),
Manawatū Tributary – Koputaroa Stream	Mahinga kai, tuna, whitebait, hauhau, kākahi, and giant kōkopu. Particular places were used for baptismal purposes and collecting fresh water for healing
Te Maire Lagoon	Papakāinga (Te Maire kāinga)
Manawatū tributary - Otauru tributary - Opapa Stream	
Manawatū Tributary - Te Awa a Ihakara	
Manawatū Tributary - Piriharakuki	
Manawatū Tributary - Hakapurua	
Manawatū Tributary - Karaa Stream	

Significant inland waterways	Values
Manawatū Tributary – Kaihinau	
Manawatū Tributary - Buckley	
Miranui Swamp	
Moutoa Swamp	
Swamp between Shannon & Poutu Marae - name unknown	Preservation of waka
Arapeti Stream	
Te Awa a Te Tau Stream	Mahinga kai (eels, freshwater crayfish, freshwater mussel)
Te Kai o te Kapukapu	
Po-a-rangi	
Whirokino (waterway to get from Matakarapa to the mainland)	Boating, fishing
Koputara Lake and Stream	Pa (Former Kereru pa/Ihakara's Reserve)
Paewai Wetlands	
Mikihi Stream/Whitebait Creek	Mahinga kai, whitebait spawning grounds, tuna, mohoau (freshwater flat fish), huangi (freshwater cockles), and tuangi. Particular places were used for baptismal purposes and collecting fresh water for healing
Te Awahau Stream	Mahinga kai, whitebait spawning grounds, fisheries, tuna, mohoau (freshwater flat fish), huangi (freshwater cockles), and tuangi. Particular places were used for baptismal purposes and collecting fresh water for healing
Kiwitea Stream	
Mangakino Stream /Makino Stream	Mahinga kai (Freshwater crayfish, eels, watercress, bullies, trout)

Significant inland waterways	Values
Taonui Stream	Mahinga kai (eels)
Aorangi	Flora, fauna, titoki, raureka
Maewa Stream (Feilding)	
Matahika (Bunnythorpe)	
Otoko (Aorangi, Feilding)	
Onepu lagoons (x2)	Mahinga kai (eels, kākahi)
Tangimate Lagoon	Mahinga kai (tuna/eels, kākahi, whitebait, watercress, pūhā), eel weirs, waka (preserved and found 30 years ago)
Wairarawa Stream	Mahinga kai (eels, whitebait)
Waimakaira spring	
Ngawhakahiamoe	Hoe waka
Aratangata Stream	
Kouranui Swamp	Mahinga kai (kōura)
Tepunanui	
Parawaiwai	
Oaio Lagoon	Pā (Rangihaeata Pā)
Wawa Lake	
Ngawhakahau Lake	
Kaikai Lagoon	
Ngakuta Lagoon	
Oneroa Lagoon	
Oporau Lagoon	
Otāniko Lagoon	
Te Kunanui	
Parekawau swamp	
Maiaua/Kopuapangopango	Mahinga kai (eels, freshwater mussel, fish), pā tuna

Significant inland waterways	Values
Swamp	(at Ngatokorua), peace track (Muaūpoko and Ngāti Huia), harakeke
Ohiao	
Wetlands in the Waitarere forestry	
Lake Waipunahou/Horowhenua	Rongoa,variety of fish, sport (racing on the lake), koiwi, hoe waka, wāhi tūpuna, kauhoe, battle ground, rongoā,
Hōkio Stream	Mahinga kai - Te Rama Tuna, eel/tuna (puhi), pa-tuna (for trapping tuna), storage of tuna, īnanga, whitebait, kōkopu, kākahi, kōura, watercress, harakeke rongoā, wāhi horoi, papakāinga (Winiata), swimming, waka (for various purposes), rongoā, water for marae uses.
Hōkio Stream tributaries	
Pukemaatawai Spring (in the Tararua ranges)	
Otawhaowhao Lagoon and Swamp	Mahinga kai
Paenoa	Mahinga kai
Reporoa Swamp	Mahinga kai
Waiwiri/Papaitonga Lake	Pa, whakamate/pa-tuna/eel weirs, mahinga kai
Waiwiri stream	Mahinga kai, papakāinga (Pipikāinga)
Waiwiri stream tributaries	
Lagoons around Lake Waiwiri/Papaitonga	Mahinga kai
Swamps at Mahoenui	
Orotokare	

Significant inland waterways	Values
Waitaha	
Waimarama	
Blue Lakes	Paru (natural dye for puipui)
Ōhau River	Pa, Papakāinga, Mahinga kai, Kokita/salt and freshwater river pipi, Bubu/periwinkles, kākahi/freshwater mussels, piraroa/soft shelled oyster, Titiko, Flounders/pātiki, kahawai, herrings, mullet, lemon fish, snapper, Tohemaro (Raukawa name for eel large male long fin with a green tinge on them), Yellow eyes mullet. Swimming, recreational places, whakawhanaungatanga
Ōhau Estuary/Ōhau Backwash	Paru (natural dye used in weaving)
Ōhau Estuary Tributary – Blind creek	Piraroa/soft shelled oyster
Ōhau Tributary - Patumakuku Stream/Kuku Stream	Mahinga kai (eels/tuna, eel boxes, freshwater crayfish/kōura, watercress, kānga pirau/rotten corn, duck eels collected nearby) a kaitiaki present in a pool, swimming
Ōhau Tributaries - Kuku Stream Tributary - Waikōkopu Stream	Mahinga kai (kōkopu/native trout, tuna/eels, kākahi/freshwater mussels),
Ōhau Tributaries - Manganaonao Stream	Native trout/kōkopu, giant kōkopu, kōura/freshwater crayfish, tuna/eels, watercress
Manganaonao Spring	
Ōhau Tributaries - Manganaonao Stream tributaries - Tikorangi Stream and tributaries	Eels
Te Awa a Tamati/Tikorangi Spring	Waiora, hauora, healing
Springs by Soldiers Road and	Watercress

Significant inland waterways	Values
Hoggs Road	
Dune wetlands - Te Hākari	Mahinga kai (tuna /eels, whitebait up stream, mud fish
Dune wetlands – Ransfield's	Mahinga kai (tuna /eels, whitebait up stream, mud fish
Dune wetlands – Pekapeka Taratoa	Mahinga kai (tuna /eels, whitebait up stream, mud fish
Waikawa River	Mahinga kai (tuna/eels, piharau/blind eel, īnanga/whitebait, kākahi/freshwater mussel, kōkopu/native trout, watercress), drinking water. Swimming.
Waikawa River tributary - Mangahuia	Mahinga kai (adult kōkopu/native trout, flounder, mullet, herrings, kahawai, kākahi, tuna/eels, kōura, watercress, pūhā), spiritual values, recreational places, whakawhanaungatanga
Manakau Stream	Kōkopu/native trout
Whakahoro Swamps	Whitebait, kōura/freshwater crayfish, watercress, tuna
Karuwha Lake	
Mangahuia Stream	
Waiauti/Waiaute Stream	
Waimarie Lake	
Te Puna a te Ora Lake	
Huratini Repo/Lake	
Kahuwera Lake	
Waiorongomai Lake and Stream	Mahinga kai (tuna), tanga i te kawa, puna rāranga (harakeke), puna rongoā (Manuka), papa kāinga, pa tohu ahurea, wāhi whakawatea, wāhi whakarite

Significant inland waterways	Values
Waitawa Lake (Forest Lakes)	Wāhi tapu, urupā, tohu ahurea, wai ora, puna rāranga, hoe waka, waka ama
Ngatotara Lake and Stream (Forest Lakes)	Wai ora, mahinga kai, puna rāranga, puna rongoā, papa kāinga, wāhi tapu, tohu ahurea, wāhi whakawātea, wāhi whakarite
Waiorangi (Pukehou)	
Waikato Stream	
O-te-pua wetland	Papa kāinga, mahinga kai, puna rāranga, puna rongoā, puna uku, wai ora
Waitohu Stream	Ara waka, i/ki te wā, kauhoe, kaukau, mahinga kai, ngā mahi parekareka, pā, papakāinga, puna rāranga, puna rongoā, tohu ahurea, urupā, wāhi tapu, wai ora
Kōwhai Stream	Mahinga kai, ara waka, papa kāinga, puna rāranga, tohu ahurea, kauhoe, wai ora, wai tai, wāhi whakawātea, wāhi whakarite
Haruātai Stream	Papa kāinga, mahinga kai, tohu ahurea, urupā, wāhi tapu, puna uku, wāhi whakawātea, wāhi whakarite, waiora, kauhoe, puna rongoā, worms for bobbing
Mangapouri	Papa kāinga, ara waka, mahinga kai – pā tuna, kānga pirau, kōura, eels, wai ora, kauhoe, wāhi whakawātea, wāhi whakarite
Mangapouri spring (behind Ōtaki race course)	
Paruauku	
Mangahānene Stream	Mahinga kai, wai ora, ara waka, papa kāinga, puna rāranga, puna rongoā, pa, tohu ahurea, kauhoe, wāhi whakawātea, wāhi whakarite
Maringiawai Stream	Papa kāinga, mahinga kai, wai ora, wāhi whakawātea, wāhi whakarite, ara waka

Significant inland waterways	Values
Ngātoko Spring	Wai ora, mahinga kai, wāhi whakawātea, wāhi whakarite
Ngātoko Stream	Wai ora, papa kāinga, pā, mahinga kai, ara waka, puna rāranga, kauhoe, tohu ahurea, wāhi whakawātea, wāhi whakarite
Rangiuru Stream	Ara waka, kauhoe, mahinga kai, pa, papa kāinga, puna rāranga, tauranga waka, tohu ahurea, wai ora, wāhi whakarite, wāhi whakawatea , wai ora
Waiariki Stream	Papa kāinga, mahinga kai, puna rongoā, tohi, wāhi whakarite, wāhi whakawatea, wai ora
Ōtaki River	Urupā, wai ora, wai tai, papa kāinga, mahinga kai (tuna, īnanga, kahawai, herrings, mullet), puna rāranga, puna rongoā, ara waka, tohu ahurea, kauhoe, kaukau, ngā mihi parekareka i/ke te wai
Waimanu (upper reaches)	
Mangaone Stream	Swimming, wai ora, ara waka, mahinga kai, puna rongoā. Puna rāranga, wāhi whakawātea, wāhi whakarite
Ngawhakangutu Wetland (Te Hapūa Wetland)	Mahinga kai, ara waka, papa kāinga, puna rāranga, pa, tohu ahurea, kauhoe, wai ora, puna rongoā, wāhi tapu, wāhi whakawātea, wāhi whakarite
Kūkūtauākī Stream	Boundary marker between Te Ātiawa and Raukawa ki te Tonga
Kāpiti - Okupe lagoon	
Kāpiti – Tarere Stream	Tuna, pā tuna, drinking water
Kāpiti – Kahikatea Stream	Tuna, pā tuna, drinking water
Kāpiti – Taiharau Stream	Tuna, pā tuna, drinking water

Appendix II: Te Ātiawa ki Whakarongotai inland waters of significance and their cultural values

Significant inland waterways	Values
Mangaone in Te Horo	
Ngawhakangutu – north around Peka Peka	
Kūkūtauākī – Olliver Crescent	
Karewarewa Lagoon	wāhi tapu urupā, pā, wāhi mahara
Ngarara Swamp	
Ngarara Stream - Black Drain	wai ora, mahinga kai
Ngarara Stream – Kawakahia	wai ora, mahinga kai, pa harakeke
Moss Smith's Lake/Totara Lagoon	
Te Puka Stream	wai ora, significant species, rongoā
Te Uruhi Lagoon	pa, kōrero pūrākau
Tikotu Stream mouth	mahinga kai, pā, wai Māori
Nikau Valley Streams	
Kebbel Farm's puna – turf farm	
Greenaway Road puna	
Waikanae River	mahi kauhoe, wai ora, mahinga kai, whanaungatanga, wāhi whakawatea, wāhi whakarite, pā tuna, kai awa, kauhoe, pā, ukaipotanga, pukengatanga
Waikanae River Mouth & Estuary	wai ora, wai tai, mahinga kai, kaimoana, kaitiakitanga, wāhi hokohoko, pā, harakeke, mana, wāhi whakawatea, wāhi whakarite

Significant inland waterways	Values
Waikanae River tributary - Maungakotukutuku Stream – East	wai ora, wai Māori, mahinga kai, pukengatanga, ukaipotanga
Waikanae River tributary - Maungakotukutuku Stream – West	wai ora, wai Māori, mahinga kai, kānga wai, pātaka kai, pā, papakāinga, tarai waka, ara waka
Waikanae Estuary	Mahinga kai, scientific reserve
Kaitoenga Wetland/Oxbow wetland	wai tai, mahinga kai, pā, papakāinga, wāhi tapu
Te Rongomai puna - in Takamore precinct	
Waimahoe wetland	pā, mahinga kai
Waimanu Lagoon/Te Kārewarewa	mahinga kai
Waimeha Lagoon	mahinga kai, pā tuna, ukaipotanga
Waimeha Stream	wai ora, wai Māori, mahinga kai, pā, mana
Wharemauku Stream	mahinga kai, kānga wai, pātaka kai
Whareroa stream	mahinga kai, pā, pā (defence), waka, ara waka, rongoā, wāhi tapu, urupā, papakāinga, whakatupu kai, whi tūpuna, mahi parekareka, rāranga, kai Māori, wai ora, wai Māori, kānga wai, rohenga
Kōwhai	
Muaūpoko stream	
Mazengarb channel/Black drain	
Reikorangi	
Ngātiawa river	
Kapakapanui	
Kākāriki	

Significant inland waterways	Values
Kawakahia wetland	
Kawakahia Lagoon	
Paetawa	
Weggery's Lake	
Rangiora	
Te Au Stream – on Waipunahau's land, off the peak at Hemi Matenga	
Ratanui Stream – on Waipunahau's land, near Otaihanga	
Ratanui Wetland	
Hadfield Road creeks – that flow into Kōwhai on eastern side of SH1	
Puna at Tukurākau	
Te Whare o te Kopete – by Southwards car museum	
Emerald Glenn Lakes and Streams	
Kaitawa reserve wetlands – behind the statue of Mary in Paraparaumu	
Paraparaumu wetlands – south western end of the airport runway	

Appendix III: Ngātiawa inland waterways of significance and their cultural values

Significant inland waterways	Values
Waimea stream/Waimeha Lagoon	Mahinga kai, pā
Reikorangi Stream	Mahinga kai
Waikanae River	Mahinga kai (eels, fish)
Pirikawau Springs	Healing springs, whakawatea, whakanoa
Wharemaku Stream	Mahinga kai (watercress, eels, whitebait and nearby pūhā)
Whareroa Stream	Boundary, paru (natural dye for weaving), Mahinga kai (watercress, whitebait, eels and nearby pūhā)
Tikotu Creek/Tikotu Stream	Whitebait, eels
Maungakotukutuku Stream	Healing springs, watercress
Ngātiawa River	Papakāinga, mahinga kai (eels, watercress, and nearby pūhā, kawakawa and other rongoā species)
Rangiora Stream	Papakāinga, Mahinga kai (eels, watercress, and nearby pūhā, kawakawa and other rongoā species)
Muaūpoko Stream	Nearby is the site where the Treaty of Waitangi was signed by Ngātiawa tūpuna. Used in the Native Land Court to confiscate land.

Appendix IV: Muaūpoko inland waterways of significance and their cultural values

Significant inland waterways	Values
Lake Horowhenua/Te Waipunahau	Mahinga kai (tuna, kākahi, kōura, flounder, whitebait, and birdlife such as whio); live tuna pātaka storehouses; surrounding pā sites and also island pā sites; travel across lake to different pā sites; wāhi tapu including urupā
Hōkio Stream	Mahinga kai (tuna, kākahi, kōura, flounder, whitebait, kōkopu, kōaro, flounder, and birdlife such as whio); pā tuna along the stream; transport to the moana
Lake Horowhenua and Hōkio Stream – adjacent wetlands, swamp and marshlands	
Pātiki Stream (Kawiu Stream)	Mahinga kai (flounder, tuna, giant kōkopu), pūhā, watercress
Arawhata Stream	
Poupou Stream (Mangaroa Stream)	
Tūpapakurau Stream	
Roto Hapūakorari	Muaūpoko headwater. A sacred lake up in the Tararua ranges.
Lake Waiwiri (Lake Papaitonga)	
Waiwiri Stream	Mahinga kai (tuna)
Ōhau River	
Lake Waitawa	
Lake Waiorongomai	
Ōtaki River	

Appendix V: Additional Claimant Interviews

Interviewee/s:

Name/s: Te Kenehi Teira

Interview Details:

Date of Interview: 12 October 2016

Location: Archives Wellington

Time: 12.30 pm

Consent Form/Interview Ref:

Interviewer/s:

Name/s: Moira Poutama

Interview Synopsis:

'For our rohe, Raukawa rohe, one of the most important features are what they call the dune lakes. The dune lakes are a series of lakes, not only fed by rainwater and water that's been ponded from the winter, but they are also fed subterraneous by puna. The importance of dune lakes is the fact that they are pātaka kai, so there are the places where we gather particularly because it was the number one source of food for our ancestors. The ones I wanted to add to the korero, ones that have been covered a little by our relatives on the Himatangi Block, particularly Ted Devonshire and Pat Seymour, because he knows all those waterways, he talks about the restoration at Koputara and really important dune lakes, ones like Koputara, still owned by Raukawa today, 300 acres that we were never given access to because it was land locked and it's only been of recent times that they have had to redesign and redig the dune lakes.'

'The importance of the story of the dune lakes that run from the Manawatū River up to the Rangitikei is that they are all interconnected by subterranean water and they are also connected in the older times by a series of streams, and the one that can still be seen today is the one that runs into the Manawatū River, it's called Whitebait Stream. It's traditional name is Mikihi, and that particular stream links up a series of dune lakes right up to Hakapurua which in winter you can see very clearly because it fills up with rainwater and water that comes up through the ground subterraneously and then from Hakapurua that

used to link up with Koputara and then the other lakes like Waikōkopu which is at Himatangi. Pukepuke and Manuka are part of the same system. The reason why they are so important for our Raukawa people is that these were the sources of an abundant stock of tuna. The streams that run out of those lakes out to sea, they were and still are the primary source of white baiting so if you go out to Himatangi at this time, you'll see in the Kōkopu Stream white-baiters all fishing for their catch. Same at Whitebait Stream at Foxton Beach. You'll see the white-baiting taking place there, our own fishermen, our Raukawa fishermen, they're all down there at this time because it's the whitebait season.'

'So the importance of these places were recorded in the Land Court Records. For Koputara in particular, that's the closest one to Paranui Marae, but at Koputara you have a whole lot of other iwi connections in there particularly for Ngāti Tūkorehe because it was their families that were represented for that particular lake and the owners were designated from Ngāti Tūkorehe, Ngāti Parewahawaha, and Ngāti Turanga along with some of the other hapū. The extent of fishing in those streams carry a number of different features, they dug out special streams, manmade waterways, not only to link different lakes, but also a place to setup pā tuna. A particular devise that was used by our Raukawa people was called Raumatangi. Raumatangi is a type of pā tuna for taking eels during the season when the eels are running; they call that the Heke Tuna when eels are going up the waterways and sometimes across the land. They will find their way to these manmade streams and that's where they were captured.'

'At Tangimate, which is the lake that is still partly owned by Ngāti Huia, today you'll see a series of manmade lakes that all interconnect and there's up to ten different streams that were dug out and on each stream they had a pā tuna and all the different families in Ngāti Huia were given a particular pā tuna for their catch of the Tangimate Lake.'

'There's a waka associated with that lake. It's in the cowshed on that property and it's owned by, well it was the Turnbull family. Today it's a farming family there and they look after the waka. So that came straight off the lake and lots of taonga have been found there too.'

Moira: Can you give us an indication of the timeframe that those manmade stream systems were being implemented?

'Right from the time when Raukawa arrived in the rohe they started living off the tuna.'

Moira: Were they made and constructed by our own people?

‘Yes, they learned from Muaūpoko, Rangitāne and earlier tribes of harvesting the tuna there. They were manmade devises and so they were built everywhere in order to channel tuna into areas so they could be captured. Atkin records the different channels that were made by tūpuna, but all the lakes had them. On the Manawatū river across Matakarapa there’s a manmade channel at the northern end that was used for getting tuna, but was also used for whitebait because the whitebait would come up the river and choose to go and breed in offshoots in the tributaries of the rivers and so we still have our places that were dug out by our tūpuna up there.’

‘Right up until my Grandmother’s time, my kuia for a time she lived at Foxton Beach right next to the Whitebait Stream. So she used to go down and do all her whitebaiting ‘cause her house was right next to it and so she would be the first one up and at the river, take her cup of tea down to the stream and throw her net in. She built a little channel off the stream just to put her net in. They still do it today, but by law you’re not allowed to do that today.’

‘My kuia had a barrier made out of wiwi. She had the more modern net by that time, the steel nets that she was using; she was using ones made out of supple jack and so you could fold it down and it was portable. A lot of our whānau have still got them.’

‘For our hapū along the Manawatū River and all those tributaries up there, just like the other streams, it’s the women that went fishing in the Ōtaki River, and if you asked all the families down there they’ll tell you about all the aunties whose job it was to go white baiting and they would go hauling for flounder and everything else too.’

‘Up there my kuia did whitebaiting, but the men and the women did it together which was really cool eh, when you think about it, it wasn’t just a man’s job or domain.’

‘The sad part about those places is that when the land court settled up those places around the dune lakes, the land court was really quite sexist and patriarchal really in that they only recognized men being put on the schedule of owners on different land blocks. That’s not a very good story for the women of the iwi because they were the ones that fished those places and they knew the land just as much as the men.’

‘I think what needs to be said is that our aunties, they were the ones that used to go hauling with the men. There were certain times when it was dangerous and the men would go on their own but a lot of the time they were doing a lot of the fishing, particularly white baiting because you need to have a lot of patience to whitebait and when you are hauling for flounder you need someone standing on the shore while you’re hauling while someone rows around in the river, around in a half circle, and then it was the strongest person who could row against the flow of the river cause you usually go with the tide or the flow of the river but someone has to stand on the shore and the nets are pulled together and people like my mother use to go with my father and aunties. So it was a family affair really, and if my father had to take anyone he’d take his kids cause we could stand on the shore and pull the nets in along the shore while he was rowing.’

‘That’s a really important facet of the way we used the waterways in our rohe. It became a family thing. You didn’t just have the lone fisherman or group going out getting tuna or flounder or whatever species they wanted on the table at the marae. They went out as groups. So when you went out to get pipi for the marae, a van load of you went out to get it done faster, that’s the way it was done. So I think there’s a lot to be told about whanaungatanga, I’m talking about going out in groups to harvest kai because that’s the way most of our people operated around gathering kai for hui, tangi and other things like that.’

‘The other aspect of the dune lakes was that it provided a place for gathering wild fowl so you had every other species of birds of flight coming into those dune lakes. In recent times it’s been duck shooting season but in the days of the Heke through to the 1920s, and through the depression days, people were taking not just fowl but ducks, swans and all kinds of birds and their eggs.’

‘An interesting thing for our people before Christianity came along was they actually believed that Papatūānuku was the Kaitiaki aye because Papatūānuku is the land. There’s a whakapapa that our people understand that connects Hinetumaunga to Hinewai to Parawhenuamea to Hinemoana; all the aspects of the environment are understood and the kaitiaki for all those different parts particularly water and land forms are all ātua wahine.’

‘The women of the tribe retained a lot of knowledge of not only fishing, growing kai, gathering kai – but the whole system of knowledge. So there’s a women’s side to it as well as a male side.’

‘There’s a place I remember my kuia saying to me along the Manawatū River called Hinewaipipi. I said “Who was Hinewaipipi?” And she said she was an ātua, because she was responsible for linking up the water that came from the mountains down to the sea. She had two sisters, one was Hineterepo and Hineuhi. Hineuhi was stagnant water where it pooled together and left those places that were used for keeping the eels.’

‘So I thought it was really neat that our people had this whakapapa that linked all the parts of the land and the waterways with a whakapapa from our women.’

Hinemoana marries Kiwa, Hinetumoana, Pakahore, Hinetewai and Parawhenuamea, Tanemahuta. Paru used for dying piupiu came from Parawhenuamea. It’s all the leaves and stuff that’s mixed with the iron, the different types of rocks and soil are all named after women. Hineone is the name of the kuia of alluvial soils and they all have husbands that produce other offspring that tell you the whakapapa of the whole environment so all the species of fish, all the species of birds, they all come from that whakapapa. It’s really important to understand all those relationships.’

‘Ātua wahine – Elsdon Best interviewed a whole lot of elders including some from Ngāti Raukawa. Metera Te Aomarere. He gave Te Ao Māramataka so it’s all recorded in his fishing devices book, in the book that’s written about Māori religion volumes 1 and 2 there are whole parts in those books that talk about ātua wahine and so you get a sense of how the whole whakapapa fits together. Of course Best being Pākehā and male, he’s not going to be too fussed about the full story being told of course he doesn’t understand whakapapa, what he understands is the different names for the different parts of the environment.’

‘Hinewaipipi is still a part of the Manawatū River that we understand. Some of our hapū, like part of Ngāti Turanga, is called Hineone and she carries the name of the kuia you know that’s significant for all the alluvial soils.’

‘The sad part of what I am trying to say here is that the Crown minimised the women’s contribution to the environment because all that knowledge has been disjointed because the emphasis is on the male progeny. You know they talk about Tangaroa, Tane Mahuta and the 70 male ātua. Every male ātua has a female ātua so there’s a particular part of knowledge that’s been lost and that’s what the claim is all about, how the lives of our people have been changed by colonization and the loss of that knowledge. So it’s

important that we not only reclaim it but we go through our Waitangi Tribunal claims understanding what has happened to our people and that our connection to the environment is still there.'

'We still fish, we still go fowling, we still gather kai and look after our environment but understanding all that and how it fits together in whakapapa for our taiao is lost in places so that's been created by colonization really and the Crown introducing education.'

'This understanding of knowledge of environment is not solely reliant on the male view of everything. The women of the tribe retained a lot of knowledge of not only fishing, growing kai, gathering kai, but the whole system of knowledge so there's a woman side to it as well as a male side. So I was really pleased to hear you ask the question about mana wahine.'

Interviewee/s:

Name/s: Sally Petly, Diane Taiaroa, Colleen Harper, Lossy Meaclem, Bobby Miratana, Albert Gardiner.

Interview Details:

Date of Interview: 9 September 2016

Location: Ngāti Wehi Wehi Marae

Time: 11.00am

Consent Form/Interview Ref:

Interviewer/s:

Name/s: Moira Poutama

Interview Synopsis:

Diane: My memories of the Waikawa were more so down the end of Whakahoro road, we were brought up on our grandfathers farm. First and foremost, we lived across the river at Aunty Hannah's family homestead and we used to have lovely kai from out of the Waikawa there. My brother Albert used to get us feeds out of the the Waikawa, lovely little tuna, they weren't huge - beautfully cooked, fried. We had trout out of the Waikawa, we had that all the time even when our grandfather left to live in Levin.

Bobby: We used to get salmon back when I was a kid. We used to get trout and salmon where we used to swim.

Diane: That's true 'cause we used to too! Plus big eels.

Bobby: They were all in the swimming holes.

Moira: What was the quality of water like then ?

Bobby: Clean, it was awesome.

Sally: Talking about how times have changed over the years like cleaning the tuna, Dad and them used to pull all the long grass and clean them down. At the back of our place, where our grandmother lived, there were heaps of springs all along there, and there were

eels and watercress, fresh water crays and stuff like that, not so much trout, and we used to go there and get them. It's a big suprise to go out there now and see it's all dry.

Bobby: It used to be all swamp out there, now its all dry out to sea. It was all swamp out there from Uncle Taha's out to the sea. It was all swamp wetlands; when you walked on it, it was all spongy, you could walk across it and down you'd go.

Moira: I remember walking across it with Whena to get to the watercress, it's been drained and is all farm land today.

Lossy: Bertram's farm used to have a lot of springs 'cause I know Uncle Bob used to put his corn in there, kānga pirau.

Bobby: Sometimes you'd come across a spring and you'd find the odd bottle of home brew, the old people used it as a fridge.

Sally: You had no refrigeration so you'd put your eels on the line and the next thing they'd be just about crawling. Nothing went to waste, we ate it and we're all still alive today.

Bobby: Its a dying art, people wouldnt know how to catch them, cook them and eat them today.

Moira: Raurekau thats a dying art today, a delicacy we would have prepared for our olds, you would have expected to see that on the marae tables back in the day

Bobby: Talking about Whetu, I remember Whetu when he was alive sitting just out there (points to the back of the marae) doing raurekau. They used to do them one at a time on the konga (hot embers of the fire) and then later on we got flash and pinched the gate off the Pākehā over there.

Sally: Aunty Dolly, Aunty Matemaurua she was just marvellous, when they used to live down the road from us, when we were talking about rotten corn just earlier she had all these certain sorts of corn. She had corn you could put in the water, she had pop corn and all sorts of different corn. Then she had all her pipi strung up all along the line, whitebait and drying shark.

Moira: What variety of fish were we catching?

Everybody: Flounder, sole, snapper, mullet, kahawai, sandshark, pipi, tohemanga, tuatua.

Albert: Kākahi. Mum used to cook it with bacon.

Moira: From which streams were we collecting kākahi?

Albert: There, behind Bertrams, were kākahi and fresh water kōura and in the Pekpeka backwash there, was it the Mangahuia? Gee we got a lot of kai out of there - watercress, kākahi, kōura.

Moira: I can remember we used to get tons of watercress here. What is the state of our watercress today ?

Everybody: All the duckweed and cow teko, spray - it's a shame. These days you have to consult with the cocky and ask when and where the last spray was done.

Watercress - we were all brought up on it aye! Part of the staple diet, its a shame aye, not a lot of watercress around today, terrible aye all the spraying.

Moira: Talking about the whitebait and how back in the day it was so prolific compared to the takes these days, is there a dramatic difference going on now?

Bobby: Huge difference going on. When I was a kid, we'd go out whitebaiting for a feed and go home. You didnt whitebait all day, you got a feed went past three or four houses and would drop some there and there, then they would recipocate when they went out. It was pretty good.

Lossy: I remember when Mum and them went out. There was one funny time when she fell into the river and she had to get her net out. They used to just get a feed and share it around to all the whānau that didn't have any.

Colleen: You used to hear about them getting a kerosene or biscuit tin full.

Albert: I can remember when we down Whakahoro Road, Mum putting the net right outside the cowshed and she used to catch whitebait. Thats 4-5 miles up the Waikawa. When you look at it, that's where all the whitebait were headed to lay eggs and so they kept coming up and she used to catch whaitebait there. When we were about 12-13, we'd go out whitebaiting, we'd end up at the runoff whitebaiting out there. We'd stay a hour or

two, she'd catch enough for a feed and we'd go home. Now you go out there all day and hardly catch a feed, its changed you fluke a catch now.

Diane: I also remember you know, talking about the cowshed, you could go where Marshall's home was and put your net in there and get a feed, bring it home and you didnt have to go all the way out to the runoff aye!

Bobby: I remember Uncle Nuki telling me one time he was at Aunty Sarah's and used to catch whitebait there and actually later on in the year, when the whitebait came down to sleep, they would turn their nets the other way and catch all the īnanga.

Moira: Why the dramatic reduction in catches these days? What is impacting on these waterways ? Have insecticides and land use impacted on these waterways?

Lossy: There was a drain by Uncle Ringi's. He used to get his water out of there for his living, to wash his dishes, cause he didn't have a tank. That's where he used to get his water from.

Moira: Stock numbers have increased over time that has impacted on our waterways.

Sally: I remember when Uncle Ringi was farming down the back there, that drain that used to run across there from Aunty Bell's – it used to go straight down. He hollowed it just by the shed and you could just scoop the water out with a bucket and clean the shed, and now it's not there. I was talking to Tracey about the water for the blocks over there and asked what happened to the drain that used to go along there. She said, what drain? I didn't even realise it wasn't there anymore. Then one day, she said these guys are ringing up saying there's water everywhere in the paddock. We found out later these guys further up there had dammed it all up and had decided to let it all go. In the meantime it had all dried up and so the water was just running everywhere and then they dammed it up again - someone with a deer farm up there.

Moira: Did we have spring water or awa that was used for cleansing?

Bobby: The Waikawa was used.

Lossy: I remember at the beach we had lovely, free flowing artesian water all the time… it was used for drinking, it was beautiful – where the public toilets are now at Waikawa Beach is where it used to be.

Bobby: Council blocked it off. it was a local water source that fed Māori. Pākehā didn't use it, but when Pākehā all of sudden wanted to use it - probably thought we don't want that.

Moira: That wai Māori would have been regarded as a taonga to us, out there so close to Waikawa beach?

Lossy: Yeah, it was a big taonga!

Moira: It would have been one of only a few coastal areas along this stretch that you had a fresh drinking water source. Did this spring have a name?

Albert: I can recall somebody saying it name, but I can't recall it.

Bobby: When we did our CIP report for NZTA we GPS'ed all our wāhi tapu and we included that as one of our wāhi tapu.

Moira: Historically, what would have been going on for Ngāti Wehiwehi when the Waikawa and Ōhau were a conjoined mouth? There would have been harakeke, rākau, animal, and vegtable production going on that supplied those ships coming up the mouth that fed the market in Wellington?

Bobby: Timber was being milled, yeah it was quite an industrious area.

Moira: It was so wet underfoot we would have had kahikatea, totara.

Bobby: Well the kahikatia was all along the coast here, down to the bottom of Whakahoro.

Moira: Then there was the Muaūpoko fortified Kahikatea clearing off to the right of Whakahoro Road.

Bobby: I've seen a stretch of it hanging in a house. I just cant remember where I saw it, it was as big as that white board there.

Moira: The Crown, district and regional councils, how has that relationship been for Ngāti Wehiwehi over time?

Sally: I suppose its our own fault really for not taking part in the council meetings. You just think, arrh another blimmin hui. But you know things like, how come those guys are

allowed to govern waterways that we always had running straight through here? They have a notice in the paper to say its coming up, but again we sit back and think, oh I might be the only Māori there making a noise and they might say, you're just like Phil Taueki and kick you out.

Bobby: Back in the day, 30-40 years ago, we had quite a good relationship with council. We had Karl Watton, he was a councillor and we had Marshall Staples - they came here so they were really approachable .

Bobby: At that time you had the Public Works Act that had a massive impact for Ngāti Wehiwehi. If you look next door here where Whetu used to live, their house was there. The council sold that in lieu of unpaid rates. Not uncommon, but it did happen - taken by the Public Works Act. Another example is down Whakahoro Road, between the road and the fence and Whakahoro Trust side is a big bloody gap from here to there that now belongs to the road board - taken by the Public Works Act. You didn't have any say in the matter, no notification or consultation. You really didn't know what they were supposed to take either and there was no compensation either.

Albert: I went right back in the archives, copying all that data for the whenua here. Some people got compensated for some of that land taken, not all. You know there's also a lot of land with the railways that were put through, even that church down here that's now a cafe.

Bobby: That was gifted by Māori. That land was given by our people - when it changed from a church it should have been given back, the whenua to our people, but somebody's got it now and running a cafe.

Bobby: Another thing with the council, because we have a kohanga reo on the marae, we had to have our water checked. It has to be to a certain standard. Our water was no good so we had to spend $5,000 to put in a ultra volet filtering system. That didn't rectify the problem because the water was good - it was the tank that in the end. It was simple to sort. It was something the council went into over-kill mode with that turned into an unnecessary and unrequired expense that marae could ill afford to outlay.

Sally: We put this house out on the farm and went through all this rigmarole where the council dictate to you what colur you can paint the house.

Bobby: It’s one rule for one, and one for the other. We are not allowed to advertise on the road because it distracts the traffic, but every time the local elections come up, all these electoral signs go up.

Interviewee/s:

Name/s: Edward Tautahi-Penetito, Donald Tait, Steve Bray: Ngāti Kauwhata

Interview Details

Date of Interview: 6 September 2016

Location: Te Runanga o Raukawa, Levin

Time: 8am

Consent Form/Interview Ref:

Interviewer/s:

Name/s: Moira Poutama

Interview Synopsis:

Donald: Our story really starts generally it comes from Mangatautari to us. It's about who we are, where we are from and how we arrived down here. To us it's about following in the footsteps of our chief Te Whata where he left from, the places he came through, rested at and the people he met on the way. We can sort of travel along those highway footprints he's left behind. To us we started the journey realistically is actually at Kauwhatapapa so Pukekura block round Mangatautari where the gathering of Kauwhata under the leadership of Te Whata journeyed through old Ōwairaka valley down thru the top of the Wharepuhunga down the western side of Lake Taupō down to the settlement of Tu Wharetoa at Te Rapa where they met up with Te Whatanui of Raukawa from Taupō they travelled down through the head waters of the Turakina onto the Murimotu tract passing the Ōtairi Ranges onto the Turakina river, follow the valley of the Turakina river down to Kāingaroa where Kauwhata cuts inland. With Ngāti Huia they cross onto the Porewa Stream down onto the Rangitikei river, follow the western side of the Rangitikei river down to Poutu, cross to the other side, Huia, go out to sea, join back up with Te Whatanui, Kauwhata cross to the eastern side of the Rangitikei river up to a place called Whakamoetakapu. Whakamoetohia is a bush is very large bush which is in around Kakariki of today.

From there they go up and join the Waituna stream and they follow that inland onto the Kiwitea onto the junction of the Oroua, from the Oroua they go up to Ruapuha, back down and they follow the Oroua river to its junction with the Manawatū from the

Manawatū they go up to Tiakitahuna from there they turn around and follow the Manawatū river out to sea. There they journey down and join up with the rest of the heke from Kāpiti.

So that's our condensed journey. Along the way there were things that happened and one of them was the capturing of different people along the way, the killing of different people, I don't want to delve too much into that.

Steve: That story needed to be told, what happened from there on when Te Rauparaha called everyone together and he started portioning out the lands. Te Whata stood up and said ki hea, it's fine you tell Raukawa where to go but we've got our lands on the Oroua and that's where the Oroua river comes into play first and foremost fully with Kauwhata.

We'll move onto the Oroua river, the Oroua river has a wairua spiritual significance for Kauwhata when Kauwata stands it's Ruahine Te Maunga, Oroua Te Awa, where does the Oroua get that wairua from, you got wairua because you come from two streams ' Wai Rua two streams.' The main stream of your mother and father forms the stream for your wairua. It's the same with the Oroua river as far as Kauwhata are concerned. What is the wairua for the Oroua to Kauwhata? Okay we look at Ruahine Te Maunga to be one of the Wairua and one of the streams, I should say, where does the other stream come from. Can't come from the river itself because that's the beginning. The Ruahine maunga, the other stream is from Ranganui. The rains fall on the ranges that form the wairua of the wairua river, that's the wairua of the Oroua river to Kauwhata and they have claimed that since they first arrived here. It's their river, their awa and all the tributaries that come off it.

The degradation that has come after that is from the Pākehā. If you look at the Pākehā before they came here back to England early days, what was their highways? Their highways were where they built channels, they tamed the rivers and built channels to strengthen the banks, but here then didn't need to do that, the wairua in the rivers was full of water. Wasn't till the degradation that the water is left and it was to become little trickles and little streams that dried up. So that's the effect that has happened since the settlement of 1840. Before that the waterways were pristine. If you look at Stewards map, the Manawatū and the Oroua right up to Puketotara (Vessels of) 47 tons. Today you can't do that. All the little significant streams had their own little river waka's for eeling and travel.

Donald: If we look and think about the reasoning behind what Chief Te Whata is actually talking about and where he stuck his pou in the ground as regards to the Mangawhata the significance of that area and what it meant for him as far as Kauwhata was concerned. We've always had our own little rough map Mangawhata – this is part of J.J Stewards thing it's a compilation. Where Mangawhata actually is. (Points to areas on maps) where Mangawhata was and the reason it was there on this bend was overlooking this large swamp it was a huge swamp that stretched all along there it was a kai source, it reminded him of the area where they came from which was the delta in between the Waipa and the Waikato full of food, the back part over here was all bush, ok right thru another good eeling area was here at Taonui right along here this river was renowned for the eels that cohabited there, the silver belly, the denseness of that forest, birds that were in there, when you look at it the pristineness of this area in here was just totally all bush, this side was virtually all open country with pockets of bush in different areas but the rest was quite open, this area backwards was all natural bush and if you look at that today on google maps there's nothing, it's all gone, this land along here what we call Rotonuiahau was land where the pou the canoe was put in the ground and given to Kauwhata that's now gone, but they changed the name, they changed it

Steve: to Kairanga because of the food the water fowl things like and everything else but then that was lost. They put in there Moutoa gates and drained it, the original name there is Kairanga and hence where Kauwhata whare tūpuna stands today was called Kaiiwi Pā, feed the people not eat the people but feed the people that's how its name was

Donald: Right along this area this river right back up the Awahuri back to Feilding was all little settlements of Kauwhata right along there.

Moira: Kauwhata were mobile? So did the seasonal food harvest dictate the movements in that landscape?

Donald: Exactly, they travelled from there over to the Rangitikei to the Ōtari ranges for the different manu and to kohi kai from the ngahere, food was also gathered right up to Pohangina valley and they did this seasonally all along there.

I think even in Atkins map there are different settlements that popped up but there are also areas where they had cultivations going and harvesting, you also got to think as far as Kauwhata was concerned we would have landed there just in the 1830's when the great

migration about 1829 Kauwhata was virtually there it stayed there as soon as Ngāti Apa and Rangitāne came thru to get their women. The deputation of Chiefs met with Te Hakeke and Te Raikokiritia, Raukawa had already moved on there. (Lawyer) Don presented evidence in the 2180 inquiry & there's a little bit of overlap there I will send you his speaking notes that will help with the spelling and references he is giving now. All agreed that I use this info as an attachment to this interview.

Donald: We really want to stay around here but our presence was also down around Manakau. Atkins map is brilliant cause it shows similar type of ground that was in and around this area, one of the key points for the reasoning for around this area, I think at the same time up in the Waikato there was harvest done on harakeke already happening this was area they knew they could probably do the same thing, so we were entrepreneurs even at that time.

What was the reason we came down here we weren't chased out of the Waikato we came down here for a specific reason the land was here there was an opportunity to deal with other people from different lands that brought different things to our people.

Te Rauparaha was far sighted as far as the future was concerned but then he needed people with entrepreneurial skills to come down here to utilise what he had opened up for them and I think Kauwhata was one of them and Tūkorehe and Wehi Wehi, we were all strategically placed in the landscape, we were the only ones to put our marker in the sand thou. You know Huranui was meant to come down and chase us away from there, there was only about 20 or 30 of us down there but even he was too scared and frightened to chase us away, but strategically, yes I mean over the years that we were here the boats were coming up here to one of our settlements over here at Puketotara big schooners were travelling up the river to collect the goods off the people

Steve: At the back of the Awahou block flax was taken off and getting flax at Foxton and here was one of the first trades going out, and the water fowls and the eels good for the settlements.

Donald: As far as the waterways are concerned we really look at everything that feeds into the Oroua as part and parcel of the river itself, I mean certainly the rain comes down and leaves a lot of moisture and feeds the rivers but little water ways natural waterways that are occurring around the river actually help, it's the life force that keeps that river

flowing they dry up and then that river dries up too, that effect's us as people that live along that river. This map gives you an idea of the vegetation that was in and around the Manawatū in the 1860's. The reason why we looked at maps like that was one to get a feel of how these old people were living in and around these areas and to get gauge of the area they were inhabiting.

When you put it into a perspective we use google maps and you really get a good sense of how these old people were living in and around that time and the conditions that they were actually living under, gives you a really good idea of the area.

We had a korero with somebody that talked about our people being chased into the swamp up in the Waikato, easiest answer to that was well we live in the swamp so why wouldn't you go home and that was it we weren't chased that was our site were we lived it was home. For Kauwhata especially one of the significant Pa that was up in the Waikato was a place called Patoa which is a Pā swamp right in the middle of a swamp and that was one of the area's they went to, they had an open view right out there so they couldn't be attacked the only place behind was tree's, they knew the signs when people were coming.

The advantage point was Puketotara up on the hill that over looked all of this, that's why Puketotara became a settlement of Kauwhata, same as Wehi Wehi

Steve: When we look back at the signing of the Treaty back in 1840 the environmental impact has been devastating we know there's been so much written about it.

Donald: That's the reason why we wanted to go back to this point and show where Kauwhata actually comes from or land that was their first foot print at Maungawhata and to give you an indication of it was it was like when they got there, we know the degradation that has happened from that point onwards and you can see that in Pākehā keep good records but they also you know their period of time would only go back to a certain way, but we can see what we had what was here is no longer there I mean there's none of the bush that you see there (points to map) Whakamotoia is gone its nothing may be a few odd rata tree there that's about it I don't think there's any totara now is there, maybe Wehi Wehi have still got a few down there. If you look down that way, the canopy of the forest right up to the ranges and reached right down to the beach.

Steve: You know kawakawa block was famous for kahikatea cause it's where all the butter box's came out of, it occurred right where Feilding race course it today. The butter box industry was in Feilding, that timber came from that Ngahere there, then we've got a map of the railway and every time the railway got a bit longer it got a new sawmill a new sawmill a new sawmill and that's why all these trees disappeared that was one of the reasons.

Steve: With all that deforestation what did it effect the most, it effected the unseen rivers, aquifers, tomo it effects everything but more so them and today this is why we are getting E.coli in water bores because the trees used to absorb most of that. Today we've got no runoffs I've got a couple of video's here for you of the upper reaches of the Oroua the Iron gate which has not changed for centuries the water going thru it and where the whio ducks are still today which are coming back to life if you look at the banks of the Oroua there compared to down below its totally different.

The Oroua River became the gravel pit for all the roads, they got all the metal out of there the mining and everything, and you know Awahuri was the biggest metal extraction in the Manawatū.

Donald: I suppose you know when that did eventuate, where that metal was taken out of the river that created a problem further down it ruined a lot of the good eeling spots along there, the first thing about it was the clearing of all those trees that created a problem with all that natural integrity all that habitat wiped out gone, swamps got smaller and pockets became little pockets, what could survive in there no longer existed they were gone, if you look on Atkins maps there were channels, man made so they could take their canoe waka thru, but thru less and less water coming down the hill it stopped the broags coming up the river, that was about 1850's 1860's coming up there.

Puketotara is the original name for Rangiotu.

Donald: I think it went up to Shannon was what we heard. Ed and I are in slightly different age groups I can relate to when I was a kid and where I grew up which is on the Oroua. I grew up on that river I learnt how to swim there, learnt how to eel, collect water I had to take water home, collect the water out of there everything.

Edward: Actually I was born in the house just alongside where Donald used to live as a young man and that was very close to the Oroua River as well, I was very close to the

Oroua River as well, I was actually born in Uncle Joe Simeon batch and I used to go there for School holidays and stay with my mum, as soon as I was born I was taken to a place called Pakingahau by a lady who was to be a major part of my life she brought me up at Pakingahau, I grew up with the Kereama whānau our dad was Ngauriwahine and our mum was Kerenape and she was at my birth she was like the midwife when I was born and I think some arrangement had already been made when I was born, I was to go with them.

That's what our people did in those days. During the school holidays we used to spend a lot of time at the Oroua River there were good swimming holes. You just used to go down to the river to get a kai, walk out to the river and gaff an eel and there was also plenty of trout and when you moved into the small estuaries, Mangoane creek there was a lot of kōura in those waterways, kōura even freshwater mussels and of course Kaiiwi Pa was the meeting place for everybody and as a little kid there used to be houses all around that Marae.

There were so many people there in those days that nobody locked their houses. As a kid you could just walk into anybody's place and be asked "You kids had a kai?" and they'd make us a kai just like that. Kai Iwi Pa was a very special place as well as Pakingahau, it's where I was brought up with my whangai brothers and sisters. The eldest was brother Reg then Mana, Anipatere, Morehu, Ropata, Adelaide, Francis, Hine and Carol.

Donald: The area where the bach was is significant because our great grandfather this is the first place where he situated his house was overlooking the river and the swamp that was there, looking across to visualise it, was like a hill dropped down and the river swam all around it looking straight over the top and where the Bach was, was just around again on a little hill. What happened was the river changed its course about the turn of the century and it went around and left it land locked like a tongue and so where his grandparents use to live, not his adopted whānau, his mother's side was on this tongue of land they had a house there which was called 'Green Gables' significant to both of us because it's an area where the river turns around the point there, that it was like a spiritual place for us. Some say it's where they… it's a healing place which is on this river that's significant for both of us and for Kauwhata. I don't want to be too specific about its location. The area of land we now administer is Aorangi No1 Sec SA2B the block 5A use to have two large cultivations there and the name was Kai Iwi.

Edward: Green Gables was the home of my grandfather growing up, he went away to the First World War, quite pleased he did get injured because it took him out of the war and he came home whereas a lot of our people didn't. The thing about that is we lost a lot of our leaders through the war. As Steve mentioned earlier about the top of the Oroua River and our connectedness: Ko Ruahine Te Maunga, Ko Oroua, Te Awa which to me is very spiritually significant when it rains the rain falls upon the maunga, from the maunga it descends into the awa and as it travels down to where it meets with the Manawatū awa it actually passes a whole multitude of places of significance to our people there, Kāinga there was also quite a few marae along the river, Kai Iwi Pa, Kauwhata settlements all the way down and of course their plantations where that river flowed to the other side were very significant food baskets for our people as Donald has explained the swamps and that food basket was really significant. We lost all those when the Pākehā came along they were drained to accommodate cows and sheep.

Moira: Those plantations would have been in place during your grandfather's time? Yes! Ae!

Steve: One of the greatest things that Akuhata did was when he came back he discovered a lot of things were happening and he spent years fighting the Kairanga district council for the metal extraction at Awahuri and finally got them given back, not to himself but to Ngāti Kauwhata. In 1937 he got the land and stopped the mining of the river but then during the Second World War they started taking it again.

I think our biggest concern is that a lot of us are not taken seriously enough. The Manawatū District Council decided they wanted to ship all the sewerage out of Bunnythorpe back to Feilding and so they designed this pipe and in this big pipe they had 2 small pipes, one for the sewerage and one for the water going the other way to Bunnythorpe, well we told them it would not work and not to do it as it was against the wairua of the river. They didn't listen and it happened the big storm in 2004 came down and blew the whole lot skyward. We were called to the meeting with the council and the Mayor at that time. Ian McKelvey and the ministers as soon as I walked in there I said 'See I told you it wouldn't work" and they all put their heads down.

Another occasion was with the Windmills. They put all these Windmills up there we sort of didn't worry about aesthetic or skyline or anything like that our concern was the vibration of those windmills on the whenua below, it would travel for miles, we told them

this, that they would always have trouble with the Gorge because of that but no they put them up there and they get them all going together, good vibrations then the Gorge is closed. They're closing it shortly for 3 months to do maintenance because they don't understand the ground underneath but we know these things.

Another case is down on the Awahuri Road just before Awahuri Junction behind Aunty Pearl's. There's a tomo there. Now that tomo I said to them, that tells me what things are happening down at Himatangi, Tangimoana, the tide and they wouldn't believe me so we went down there and I gave them the exact reading from that tomo, what the tide was and the state of the tide at Tangimoana and Himatangi because it rises and falls, it's a breather. You know we go back to the Second World War the yanks came here and they were looking for oil and the first place they picked on was the Manawatū, Pikikotoku or Mt Stewart and they drilled there. Through the drilling of Mt Stewart they trashed the aquifer right back to Kapuni. That's how big these aquifers and these things travel and there's maps around today with all that information on it but it shows you they don't look far enough or deep enough or come and understand us.

With the advent of the RMA it woke a lot of people up but Māori were second to wake up to it. The Manawatū District Council rushed out and did a lot of those resource consent applications along the river in their names and they continued on with mining rights and everything, things like that. We had an agreement with Horizons MW on the removal of metal from the Oroua River from Armadale to the upper reaches. We were supposed to continue on with a MOU for the lower reaches. What did they do? They crapped on us didn't they.

Edward: Yep they did. We gave them a consent for the river with the understanding that we would get a percentage of the royalties of the metal coming out of the river and we ended up with nothing. I think we did finally get 50cents

Steve: But for the upper reaches only not the lower it was two different consents. It was a consent for the upper and consent for the lower reaches. We signed the upper reaches because they needed that metal urgently to put up their Windmills and we got 50cents a cubic metre put into a trust fund for Kauwhata but that's another story and we won't go there in this interview.

Then they wanted to make it a whole global for the whole river and we objected to what they were doing until we signed an MOU for the lower reaches. When I said yes we will do that and because to stop holding up the process to allow it to go through swiftly we agreed to withdraw our objection to it as soon as they got their consent from the Environmental Court BANG!! They cancelled out our agreement and we are still in the lurch today. We couldn't afford to go to court and yet I know the resource consents the Air Force, we had a beautiful working relationship with the Air Force and resource consents to use the aquifers over there but District Council and their resource consents for the aquifer they haven't listened and those aquifers while they are still alive today it won't be long before they are tainted like the others because where is the water coming from? It's coming from heavily farmed land and it's only a matter of time before it seeps and leeches through.

Edward: That's the heavy dairy farming especially the high nitrates. None of our waterways were fenced off. The cows just used to wonder through there. Back in the 50s, 60s, farmers didn't have the number of cows they have today. The thing with the cows is the tūtae on the land it sat there and when it rained all that stuff leeched from the land into the waterways and today with the number of cows there's not 50 or 60 but 500 or 600. Imagine those having a tūtae in the river even on the land, it has a huge impact.

Steve: A lot of the consents today are not notifiable by the Council because that's how I became involved first with the consent for Boness Road. This is a very spiritual place for Ngāti Kauwhata. There's a very historic photo of that because we had three Kaumatua of Ngāti Kauwhata in a picture in the Manawatū newspaper saying that we beat the local landlord in the resource consent. It's the first time and Ngāti Kauwhata were really proud of it. I even gave the landlord a pen to sign the paper that agreed to what we agreed to in the Environment Court. That was a classic example, no one understood the ramifications of the resource management Act at the time. I was fortunate because I was doing my thesis on it for my local iwi down south. I was able to pick up on it quite quickly.

Edward: One of the things I didn't like about the resource consents was those who were approving the consents were councillors but also farmers so to me it was like they were giving themselves resource consents to degrade our land and waterways and it's just a matter of time before those tomo aquifers are going to fill up with paru.

Steve: I think one of the biggest impacts we have had on the river is a lot of the cowboy metal extractions. I hate identifying wāhi tapu sites. Eddy and I have found several along the river we've got the council to come in and cover them up for us. They've asked us if we want these sites put on their maps and we've said no.

Edward: We use to love swimming in the Oroua**,** absolutely loved it because the water was warm and the reason it was warm was because of the discharge from the Freezing works so you enjoyed the warm water but bits of cow and sheep would come floating past right through the 1950's and 60's.

Donald: There use to be a period where one part where they wouldn't let any effluent go because it would swirl back but after the works finished at 5 o'clock everything was let go and that's when it was blood and everything came down the river. It was good for the eels, the eels loved it but if you were swimming you knew you had to get out of the river. Both of us swam in the river and in the summertime it was beautiful especially during the day but after 5 o'clock you stayed away.

Getting back to the farmers, I relay the story where I grew up, there was down the road from us, this farmer and his effluent ran straight out his cowshed into the river and that was there all the time, he didn't think anything about it, you know and we didn't either there was just one big green patch, it was dark green and stayed there, I spent a bit of time with the cocky and my cousin worked there so I was there all the time, you'd get the big powerful hose and you'd hose it all off and just pushed it into the drain and you'd just watched it go straight out, you know unbeknown some of those things you remembered where happening to the river. For me my recollection as a young person learning to swim in there and how my brother taught me to swim, put me on the other side of the river and told me you got to come home you gonna have to swim across here I think I was only about 4 they were playing and I was stuck on the other side of the river so I had to swim and well if you didn't you had to stay there so I did it I swam back over there.

Edward: And one of the ways we got across the river was holding onto the horses I used to hold onto the horse's tail.

Steve: That wouldn't happen today cause there's not enough water in it, one of the good things for Maoridom was the reform of the RMA Act and local councils Act a lot of roads board, rabbit board and that are all gone and put into Horizons MW but the bad thing was

Māori never got representation in there, that's the biggest downfall because they then became responsible for all these environmental impacts but Māori had no representation, even the regional council today, who is Kauwhata's representative there, they haven't got one, Gerald Albert from Whanganui was the last Māori liaison person in that council that I know of where we've got no one today so they're free to do what they want, a lot of it is our own fault, I got hōhā I was going to meetings over there every week arguing the same things time after time getting nowhere, we were not resourced it was all off our own backs, we didn't expect to be resourced but we did expect to be listened to, or come back with an answer or something like that but no they just wear us down in the end.

Donald: As far as the waterways are concerned for Hapū and whānau from when I was growing up as a kid to what is happening today, very little as far as our whānau are too many out there at this point in time are eeling out of the river anymore, maybe one that's about it, before there was a lot of people that relied on those waterways for food, there was seasonal work freezing work seasonal work for people shearing they utilized the growing of kai at their homes big gardens and eel was a necessity and the flax all the pūhā and watercress was growing in and around those streams, Taonui was one of those streams where it was thick with it, it was rift with a lot of watercress it was a big area where we went to get watercress all the time. The Mangaone was another area also significant for Kauwhata is the small waterway that are connected even around our Pā we have the Mangatimotu which flows from the large swamp above the Pā and back to the Oroua.

Edward: That was our food basket for Pakingahau as was the Mangaone because I didn't like the eels across the road they were yellow belly tuna, we think it was because of the cold they were darker, in the Oroua they were silver bellies, Mangaone was freezing cold water.

Steve: The Mangaone is Kauwhata's name but some call it the Makino lagoon if you go out of Feilding the first bridge on the left hand side there is a Taniwha it lived there, this is true you can get it out of the paper two cars went in there one on top of the other and you couldn't see it, there's a big hole where that the Taniwha lived in, this only happened a few years ago.

Edward: You were brought up knowing not to go there. It's quite amazing you see this stream meander down it looks so peaceful, there's a house right next to it.

Steve: That's Perigo's house. I've never seen that house flooded I've seen water to the step but never flooded in yet everywhere around it is flooded, it seems to protect the people in that house and there have been some big floods around there.

Edward: What it is, is the Makino and Mangaone comes down and they flow back out together to the Oroua but where it comes across from Halcombe area it goes under the Awahuri road that that's where this big pit is, a natural big pit.

Donald: I was born in 1953, I was there for 20 odd years the early parts of your life with regards to the river it was always there you utilized it you learnt to swim to eel. I always remember going around with my father and brother's cousins catching eels, without torches but with an old tyre put it on a stick and walk around but where we went from our grandfather's back round to Boness road we would have a bag full of eels and that was it, probably only took us about an hour. There was a heap of eels that was one of the good experiences I had around there some of the bad experiences was actually when one of my relations got caught in a whirlpool down there and my brother pulled him out, grabbed him by the hair and pulled him out that was a bit unfortunate but he survived and still here today. For a lot of people that lived at Kai Iwi Pa it also became a bit of a roadway some of them actually used it to get to work they used it to get to the freezing works.

Steve: In 1956 they did a report on Kai Iwi Pa the report was not a very good one an unhealthy one, it was about getting everyone out of those houses and getting them into town, now why did they want to do that? On its own you think it's for health reasons and everything else like that, but then you go to another government department the roads board operating at the time the object was to bring Milson Line straight out around Kai Iwi pa, put a bridge across the river straight to where the new industrial site on Kawakawa road where Manawatū freezing work and Watties and all that were there was a quicker transport route than to have it go out the other way, but they never got to get the bridge up anyway.

Donald: Back to the river from my life span and what I understood about it and degradation of it the impact that was coming from town, I don't really believe it was just the Freezing works having the major impact, I still believe it was lot of the minor industry

that was starting to crop up alongside the Oroua, there was the fellmongery another freezing works cropped up and I'm not sure when the sewage plant eventually ended up out on the kawakawa block that started to come on too but I know that the fellmongery was one of the main polluters because of the chemicals they were using to cure their skins there was a lot of that blue sulphuric paint they were using, very toxic.

Steve: It's only been the last 5 years since the storm water was diverted into the treatment plant before that all the storm water runoff in Feilding went into the Oroua. You still got problems because it's going thru Te Maunu Park the pipe that's going thru Te Maunu Park burst the other day it spewed sewage and everything up into Te Moana Park, so they've still got problems.

Edward: There used to be a lot of logs flowing down the Oroua river, my grandfather used to use draught horses tie the logs together and pull these bloody big logs out of the river, I think they must have been cutting trees down further up the river, clearing the land and just throwing them in the river and they would just come down.

Moira: Was there any significant ngahere to Hapū and Iwi?

Everyone: There was nothing left.

Donald: There was this little bush owned by a farmer still there today Gordon John aye there a few trees there when I was growing up you used to. You could hear the old Ruru calling from there. I think back to what my grandfather was saying he spoke of the dawn chorus, I used to think what are you talking about, he said what woke you up when you were out there was the sound of the birds those were the things that woke you up it was just like music to your ears.

Steve: Mana wahine korero: we have a letter saying that 23 Ngāti Kauwhata women asking to be put on the vote.

Edward: We always followed that petition of Kauwhata from people that put a petition in and one of those was

Steve: Te Ara o rehua Te Horo or Te Ara pohi it's significant because if you go to old time when significant things happened in your life you changed your name.

So what name did she use to sign the Onslow accord to? Protect the Huia bird. She was a very prominent wahine for Ngāti Kauwhata. There is a big painting of her in kai Iwi Pa.

I have a tie pin that she gave my great koro many years ago, years ago when he came here as a chief judge of the Māori land court, the tie pin is 3 coins of Victoria's head to remind him of the 3 clauses of the Treaty of Waitangi

Donald: Nga Uri Wahine o Kai iwi that's the name of the place where we come from and that's where we get Kai iwi pa from.

Mana Tane: Te Whata, Te Koro Te One, Ngāti Wehi Wehi chief of Puke Totara.

Mana Tane – Te Whata chief of Managawhata

Te Koro Te One – chief of Puketotara/Rangiotu

Takanga Te Kauka – Pakingahau mouth Oroua

Hoetekahui – Awahuri & Raurangi Pā & Manawatū

Te Whero – a wahine – Wiremu the husband was a spokesman for Kauwhata

Donald: The tributary that as far as we are concerned is the Oroua, Kiwitea, Waituna, Mangaone, Makino, the Tuna is still there, but the other little one's the little spider webs, that sort of connect, to those one that feed into those also have all gone. This old kuia that lived just up the road from kai iwi pa, she had a habit of putting her delectable into the swamp, me and her grandson were playing in the swamp one day and we saw the rope hooked on to this bag and thought what's this and pulled it up and thought oh geez what's this unbeknown to us so we just left it there she called us on day we got a hiding off this old Kuia for doing that! It was rotten corn that we'd pulled out of there, where her house was it over looked this large swamp and that's where she put her corn into

Edward: That is where everyone put their corn.

Donald: My grandfather had spring out the back of where he lived he dug a hole and filled up with natural water that's where he put his rotten corn to ferment.

Steve: You take the one that was in the mokopuna paddock Kevin Cowan was filling it in with dead cows & things if you talk to others outside NZ are called sink holes there is water underneath churning away gradually filling up with sediment, underneath is a

underwater aquifer, that is where Miss Hicks had her corn. But because of what he was doing it been in that sink hole it's rendered useless.

The other thing about that tomo, there are signs before the taking of metal that there was a sink hole with an aquifer under it, they just don't understand geometry of the land.

Tūpuna knew it they felt the vibration of the land and they knew when the 2004 flood came there they didn't wipe out Kai Iwi Pā no it didn't it went all around it, it didn't go into the tūpuna whare it went into the dining room but that's a modern thing a lot of silt underneath but it didn't go in the whare tūpuna because it was on safe ground they knew the vibration, that drain in the old days they used to have waka races in it. It wasn't a drain it was a creek but it's now called a drain and nobody looks after it.

Edward: The Tōhunga Suppression Act impacted on Ngāti Kauwhata as Ngāti Kauwhata now go to the doctor first and their own second.

Donald: A lot of our people have lost that one maybe thru that suppression act, it hasn't been passed down and thru the years as far as Kauwhata is concerned we are a people that I think have allowed situations to occur and slip by us and not keep up with those customs that were prevalent amongst our old people, I think that's reflected in what we have in some of our young people today.

Interviewee/s:

Name/s: Rodney Graham, Serena Boyes – Ngāti Kauwhata

Interview Details

Date of Interview: 6 September 2016

Location: TROR Levin

Time: 2pm

Consent Form/Interview Ref:

Interviewer/s:

Name/s: Moira Poutama

Interview Synopsis:

Rodney: It was Papa's father at that time who lead the heke down, it was said that they separated at Turakina. Raukawa came out to the sea, Kauwhata went inland to traverse the rivers. They carried their waka over from Turakina to the Rangitikei River. They navigated the Rangitikei, they crossed over to the Oroua, they navigated the Oroua and then they also navigated the Manawatū, so our people were once ocean people now they have become river people. The river is very important to Kauwhata in respect that now that's our main highway when our people came here they used the rivers as a main highway and as a source of food. It was said that some of our warriors had stayed behind, not all came down with the heke of Te Whata some of them stayed behind for the battle of Taumatawiwi.

I've given a historical view of how the awa was our waterway and was our highway.

Kauwhata settled along the Oroua River. We have two marae standing today, Aorangi and Kauwhata. They are both within a stone's throw of the awa, they're not far. The other marae's that were established along the Oroua, one was Raurangi, we know that's a Kauwhata marae because it's named after my tūpuna. Raurangi was a place along the Oroua closer to Awahuri so as they settled they settled along the river starting from Pakengahau, Whitireia, Puketoatara, Maungawhata, Maungawhero, and Raurangi. These were all early marae and then of course Kai Iwi, Iwatekaumaiwi which is not a standing rūnanga marae, a place where all the chiefs came to korero. A lot of the land hui that were

taking place in the 1800's were at Awahuri so Awahuri was a very significant place and had a lot of mana there and when we look at the lay of the land and how they gathered there. I know that's all been changed since the coming of the Crown but in those times Kauwhata had the mana of the Rangitikei and the Manawatū. This is seen in the early ethnologists and minister who came through this area all noted that if you want anything you have to see Kauwhata so at some stage the boundary lines of Kauwhata have moved somewhat since the original boundaries were marked down, so with that you see the access to the awa taken away.

So how important are these awa to us?

In our time as children, some 50 years ago, the awa was everything to us just as my children and mokopuna look to the play station, we looked to the awa. We looked there for our food, our enjoyment. The river was everything. In the school holidays we would spend days down there and all we would take was a box of matches and a couple of spuds. We would light a fire, hunt all our kai, throw it on the fire and go back swimming. Those were the times that I know of the awa.

I recollect this that over the years and as we got older the river started to taste funny, that was the first time to us as children. That water doesn't taste that nice these days, because we drank the water.

Moira: So there was a time when that water was drinkable

Serena: I swam in that river and drank the water too. I'm 45 now so that's about 30 years ago. I don't take my kids anywhere near the river, no, nowhere to take them now.

Rodney: It's important at a certain age that we moved away from the awa somewhat but our children remained down there and it was still a source of enjoyment for them.

Moira: In your lifetime you can recollect being able to drink and swim and eel in the river?

Serena: Yeah just do the same things my mum and her siblings did too. It's probably been 30 years since we've gone back there or felt it ok to be there as well. You can't access it the way we used to, walk through the paddocks. Because it's polluted a lot now, there's all these signs saying you can't swim there up the river, down and at Awahuri where we used to be all the time, never go back there so it's been a long time.

Even being able to show our children what it was like for us, their nannies and koro's they might not know that in their lifetime we might not get there again

Rodney: In our time we had access to all the awa, anywhere we wanted to go even though some of the land might have been owned by Pākehā we still had access to the Taonui stream. It was a place where the tuna would come. I believe it's an old route, an old waterway the tuna used from the main rivers into the swamps. One time the area of the Kōhanga and the lands of Kauwhata were all in swamp even Feilding was built on swamp, the tuna and the fowl it was known as the bread basket because of the great amount of food that would gather there

Even up to my time access across land, didn't matter who it belonged to, was always accessible. When my children started to grow up and go eeling they would come back and say Dad that Pākehā down there is trying to kick us out. I'd say just tell him to get lost, we were in this river way before you came along, and they would do that but I noticed that more and more started to disagree with our children down the river. Now my boys are 30 something now nearly 40, even up to their time they used it as a place of recreation, food and enjoyment

Nobody had the right to tell us to get out of the river, this might be your land on this side and that side but we always had the assurance that, that place down the middle belonged to us, that river belonged to us. When we used to go eeling and so forth we'd come back and our grandfather would always say bring some of those eels over here, so we'd go past his house and drop some eels off there. We'd drop some eels off at Auntie's. He was always attracted to the Lampreys; we didn't like them or catching them they had ugly mouths but he loved them. They were a delicacy he never sort of told us about that, we were happy with the silver bellies. We got, not only tuna but we got whitebait, not that many. There was flounder, crawlies, and kākahi. We did find them but they were sour kawa to us. The river began to change because of the pollution that was slowly exposed to it

Serena: We saw the algae, the effluent being dropped in there by the farmers, from the towns, and it all seeps down.

Rodney: I took one of my lawyers down there the other day, I said Bro, this is where we used to come eeling in the awa. Before we go down, take a picture of that sign NO DOGS

ALLOWED etc. You can't go down there. I said this is the cleanest the river has been in a long time and it's only because we've had endless rain for a few weeks and it's flushed out all the paru but in the summertime it smells, it's pirau, it's horrible, today if the kids want to go eeling they have to go a long way away.

My father grew four acres of kai you know. Corn, Cabbages, kānga pirau. He used to get us to put it in a bag, tie it up and take it to the river, come back some months later, go and get it, then you know why it's called kānga pirau. The river was a great source for Kauwhata as river people.

Over the year's access to those places has been restricted, even stopped. We drank that water; you would never drink it today. We had a place at the marae it was called the tongue and there they would wash the tūpāpaku and clean them before burial so that was a wāhi tapu, a sacred place which the river gave us, so spiritually, physically and even psychologically we could draw from the river all the hours of playing down there must have done lots for our wellbeing psychologically.

If I go back I remember reading some books about early ethnologists that came over that said amongst the Māori you would not see any mental health, when I look at that and think about that well what's happened from that time to this time it's prevalent amongst our people today sad to say but it's a plague amongst us, but thinking and surmising of this is, if we neglect our whenua and our awa there's some kind of impact that must fall amongst us and maybe.

The awa was a source of cleansing so you would go down to the awa to cleanse yourself from that mamae or whatever was on top of you, today I go have a shower, I know it might be sad but he wai it's water. I go to the shower to wash it off

My daughter she did a tangi down at the marae for the first time, she was the head cook and I said, how did you get roped into that? Who's down there? I was gunna go down there and pull her out she wasn't old enough to do that, I said, Who's down there, she told me. I said Okay you'll be alright, they'll look after you and I knew they would look after her but every night after the tangi she would be at home laying on my bed, Oh Dad, and when she finished I said to her, baby you go home and you wash it all away and I will have a karakia for you and then you go have a shower. So the source of that cleansing

was our awa but the awa is so paru you don't want to get in it today, you got to travel 30 miles upstream, you got to jump in the car and travel.

We never sold our food, we never sold our tuna.

The old man had all these gardens and not once did I see him sell anything. He bartered, he traded. He had corn for miles. We planted them and weeded them, we were very familiar with them and watered them, a stone's throw from the Mangoane, he never sold anything.

We tried to do something as a business on our piece of dirt by the marae, we've got a place down there right on the awa, we wanted to bring a crusher in and crush the metal because we were like weighing up the advantages. We got a quote from a man who had a crusher. He told us of all the benefits you would get if you could bring the crusher down here instead of just getting raw metal. You would have 6 different kinds of gravel that you could use and sell and each one dearer than the other so it would be more profitable, so we had the setup ready to go but access was denied, denied by regional Council because they on sold it to the likes of roadside construction, there's the Iwi trying to do something for themselves and their being denied access to their own resources.

Uncle Minor wanted to build on the land at the marae and he was told sorry you can't go there Māori, it's a flood zoned district you have to go build in town, straight after he moved to town and built in town, however at that time Pākehā continued to build in that so called flood zone.

Rodney: In the 1960's we would sit many times with uncle Minor and he used to tell us about the taniwha in the river, the taniwha would always come up, it stood up one time.

He saw this log floating upstream, I mean it stood up and had a korero with him. We keep hearing that. He's gone now Uncle. Uncle Minor was the kaumatua i runga i te pae o Kauwhata for many years, Minor Graham.

I never saw the horse racing on the track that they had around the marae, was before my time but I heard about it.

You know the reason why the river moves so much. You won't stop a river from moving. You go down to Tangimoana where the Rangitikei comes out, that place, it's moved that many times it's not funny. The concrete toilet down there, that thing toilet was wiped out

by the river years ago, the tides changed, it was just ripped out. You'd think something like that would last but that river changed, nobody gunna stop it but it doesn't help when people are taking metal out of a certain area which is causing the river to go where it shouldn't go. People have been losing quarter acres on some of their houses in town.

River management by Pākehā was non-existent.

Serena: I owned a property in town and the whole of the back of it got taken away by the river, yeah, so underneath the garage, all under there, so it was condemned you know, we had to pull it down, 6 or 7 years ago.

This is the council, they don't care what they do, they are accountable to nobody. You might think that they are but they're not. They are the law when it comes to the river.

I've got a question? The Māori people, they use to consent those consents, would have no knowledge of the awa, the flora and fauna and what it affects. I've got to question it, because council have a good way of hunting down people who say yes.

Moira: What has the level of council representation over time been like for Kauwhata and the Oroua?

Rodney: I think it is better answered by Serena, she's married a Pākehā fulla, his dad is a respected gentleman, they're the local RSA, Rangitikei Club. He had a saying that he said, that you told me about. Every time those Māori argue...

Serena: They'd just let them argue so they could just get on with what they needed and just leave us to our own demise. So any raruraru amongst the Māori worked for them because they weren't hindered by doing anything, so stir up the Māori divide and conjure hasn't changed

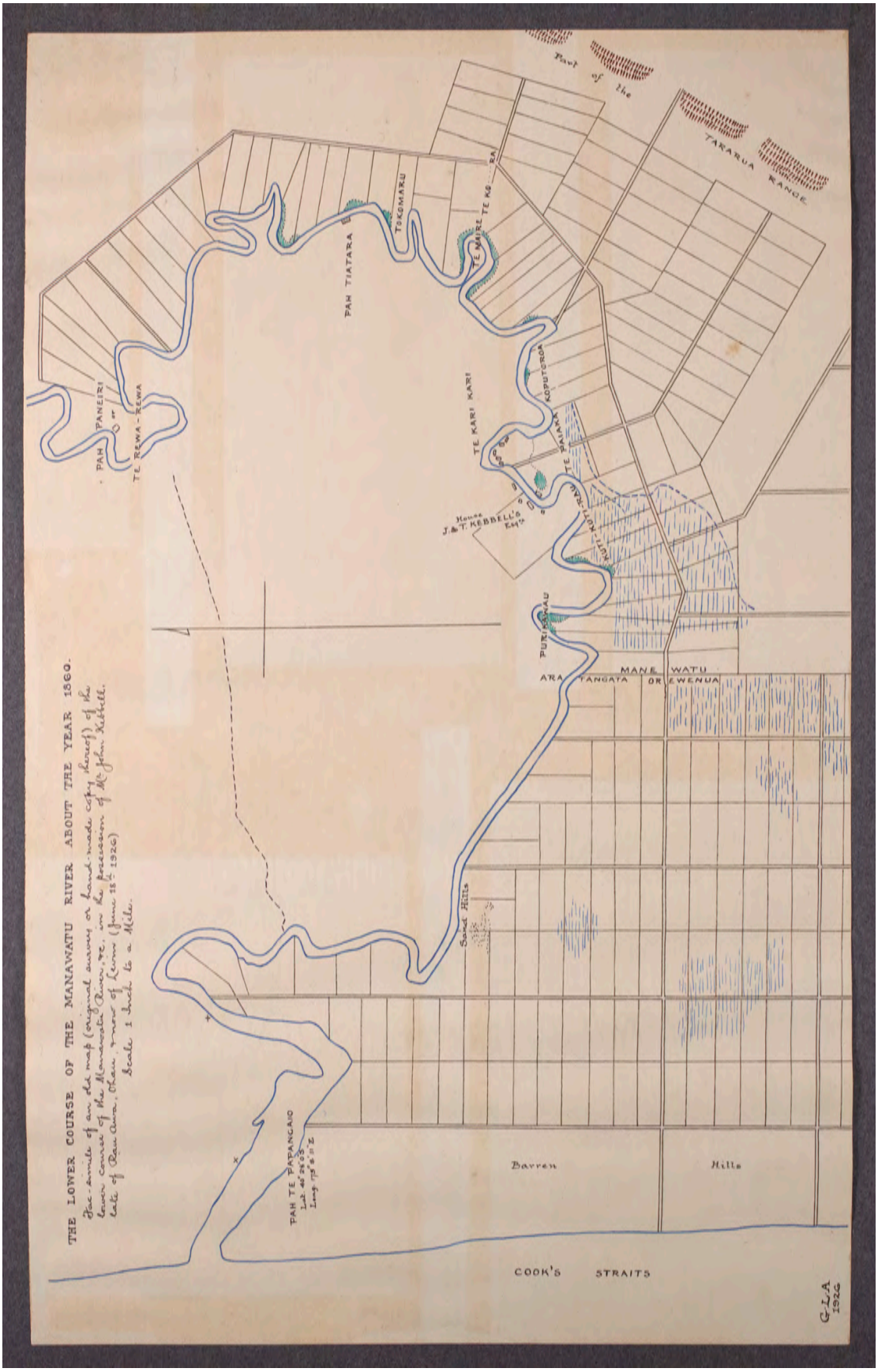
Rodney: In those days anything to do with the awa and as a whole for Kauwhata, they wouldn't go past my Grandfather. They wanted to rebuild Iwatekaumaiwa so an ope went up to see Koro, Koro looked and said, Over my dead body, and still hasn't been built to this day, my father never took over from my Grandfather, he died some 5 years earlier but when he came to do something for Kauwhata house they went and saw my older brother to ask him if we could repair the whare so my Grandfather, his father and his father have been the kaitiaki of Kauwhata not only in death but also in life, the marae, the urupā, nothing got done without Koro.

Appendix VI: Inquiry District Colour Maps

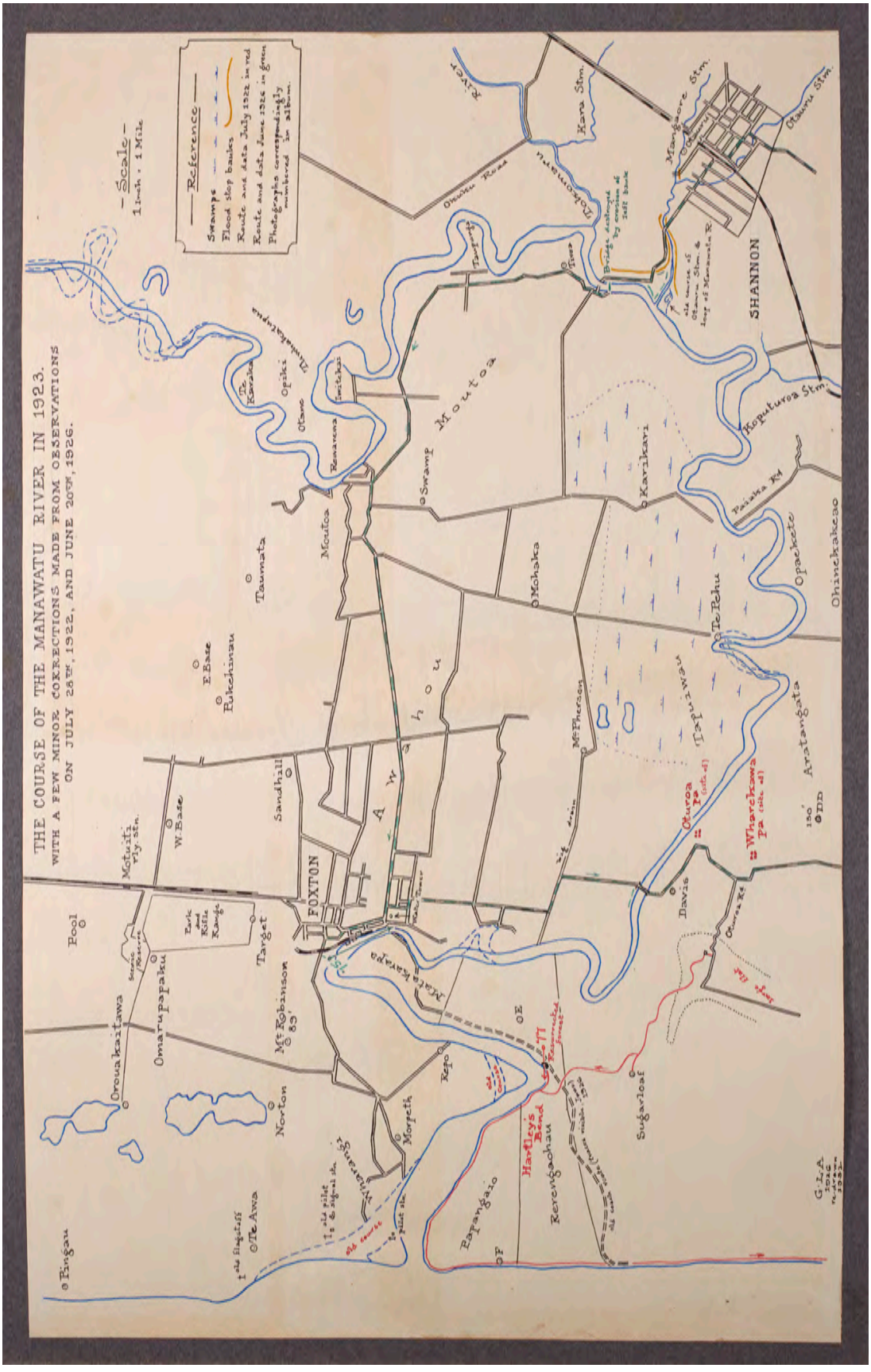
Maps by GL Adkin:

The following 11 maps are scanned reproductions of the original colour maps drawn by Adkin and located in the GL Adkin Photograph Collection, Album 13 held at the Alexander Turnbull Library.[1507]

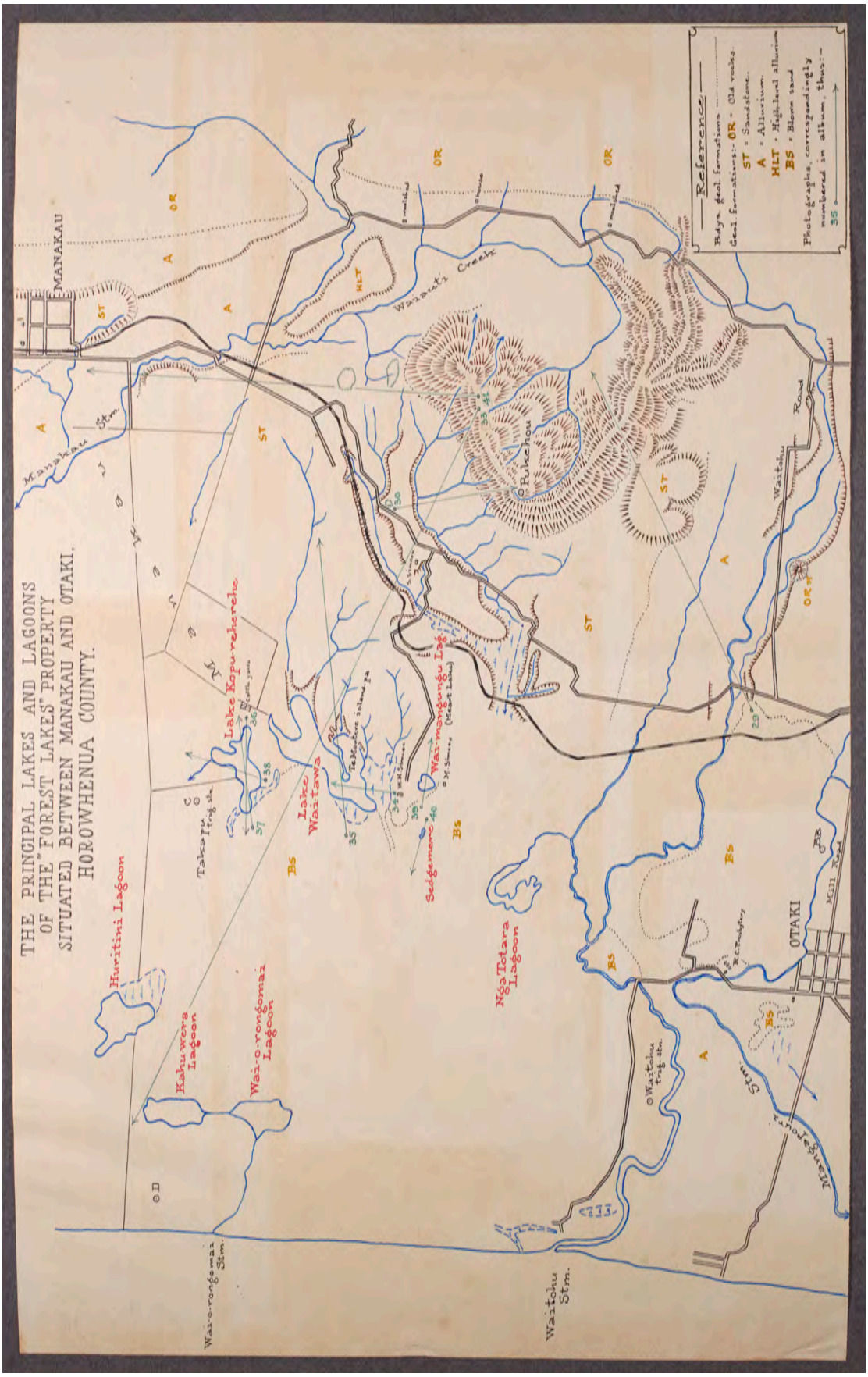
[1507] Photographic collection, PA1-q-002.



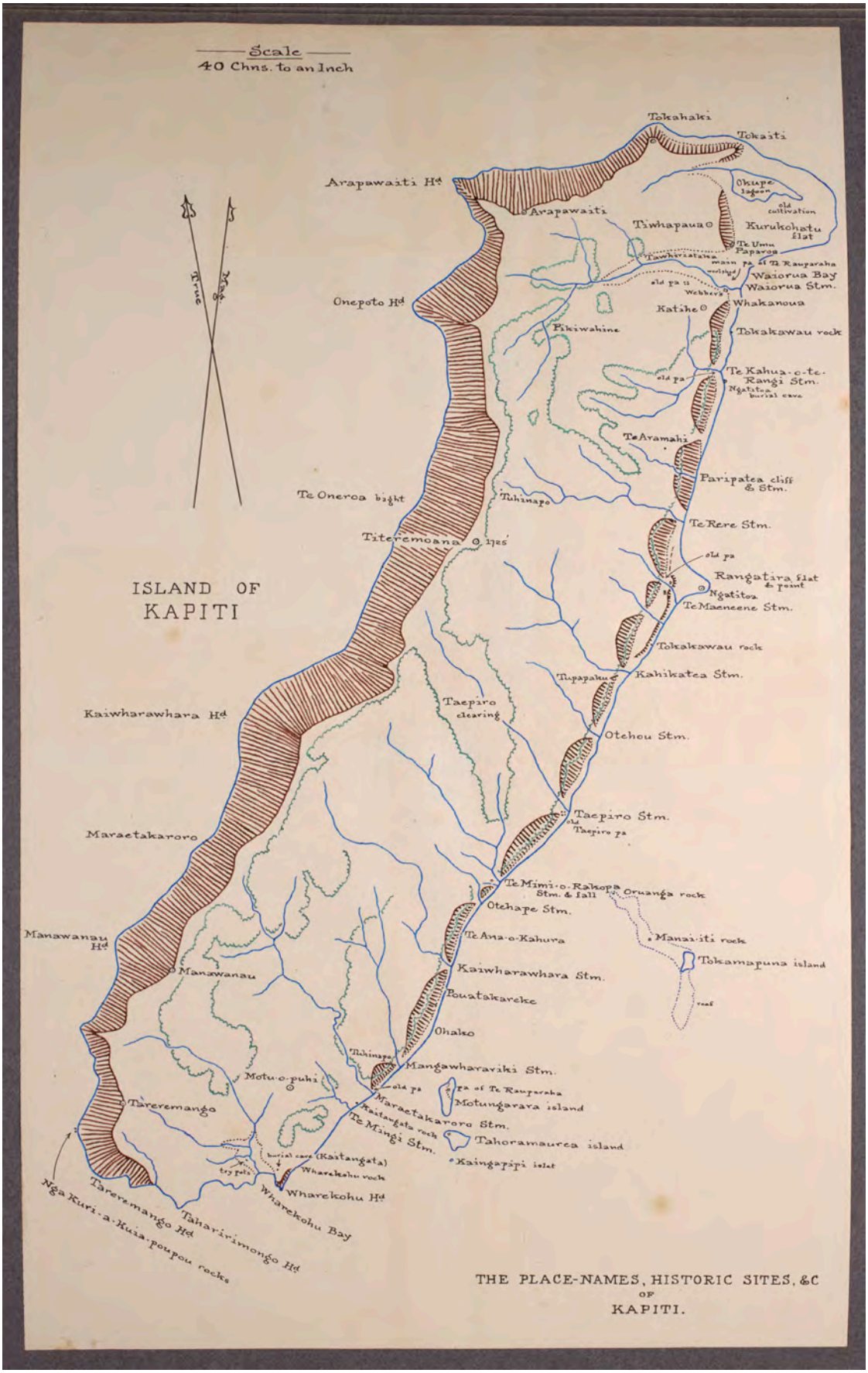
Alexander Turnbull Library, Adkin Album 13, PA1-q-002-05-map, Image opposite page 5.



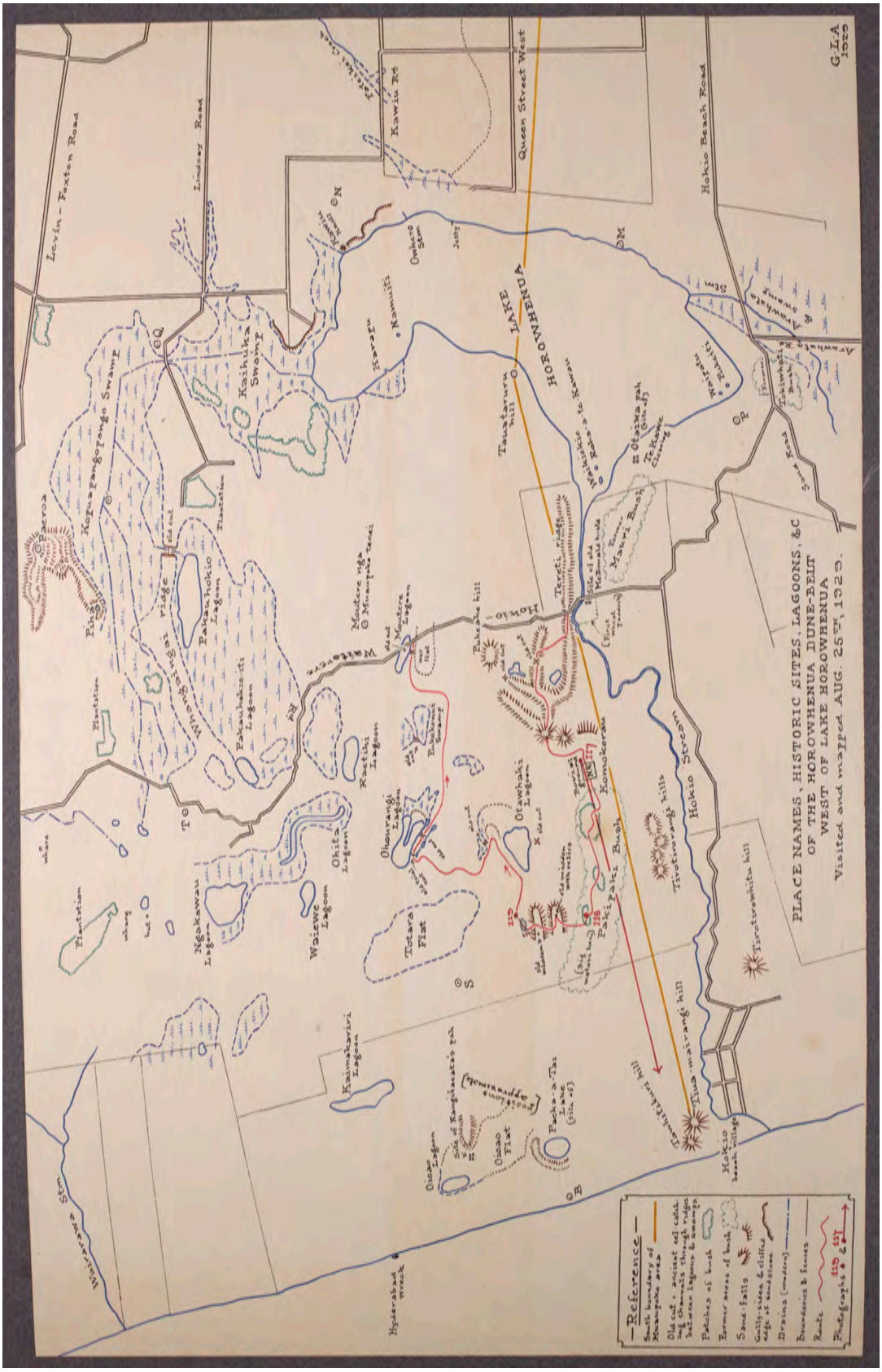
Alexander Turnbull Library, Adkin Album 13, PA1-q-002-07-map, Image opposite page 7.



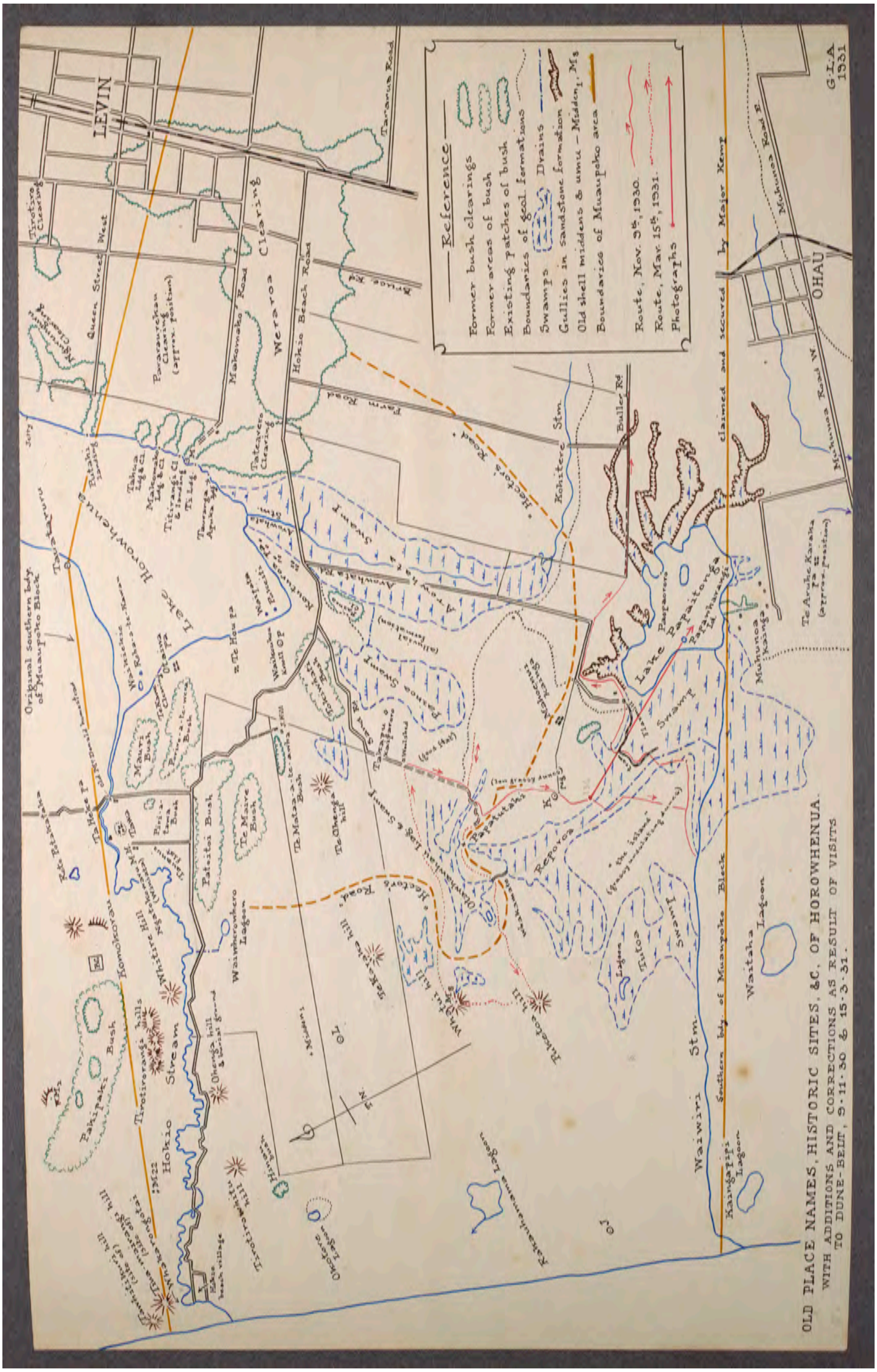
Alexander Turnbull Library, Adkin Album 13, PA1-q-002-08-map, Image opposite page 8.



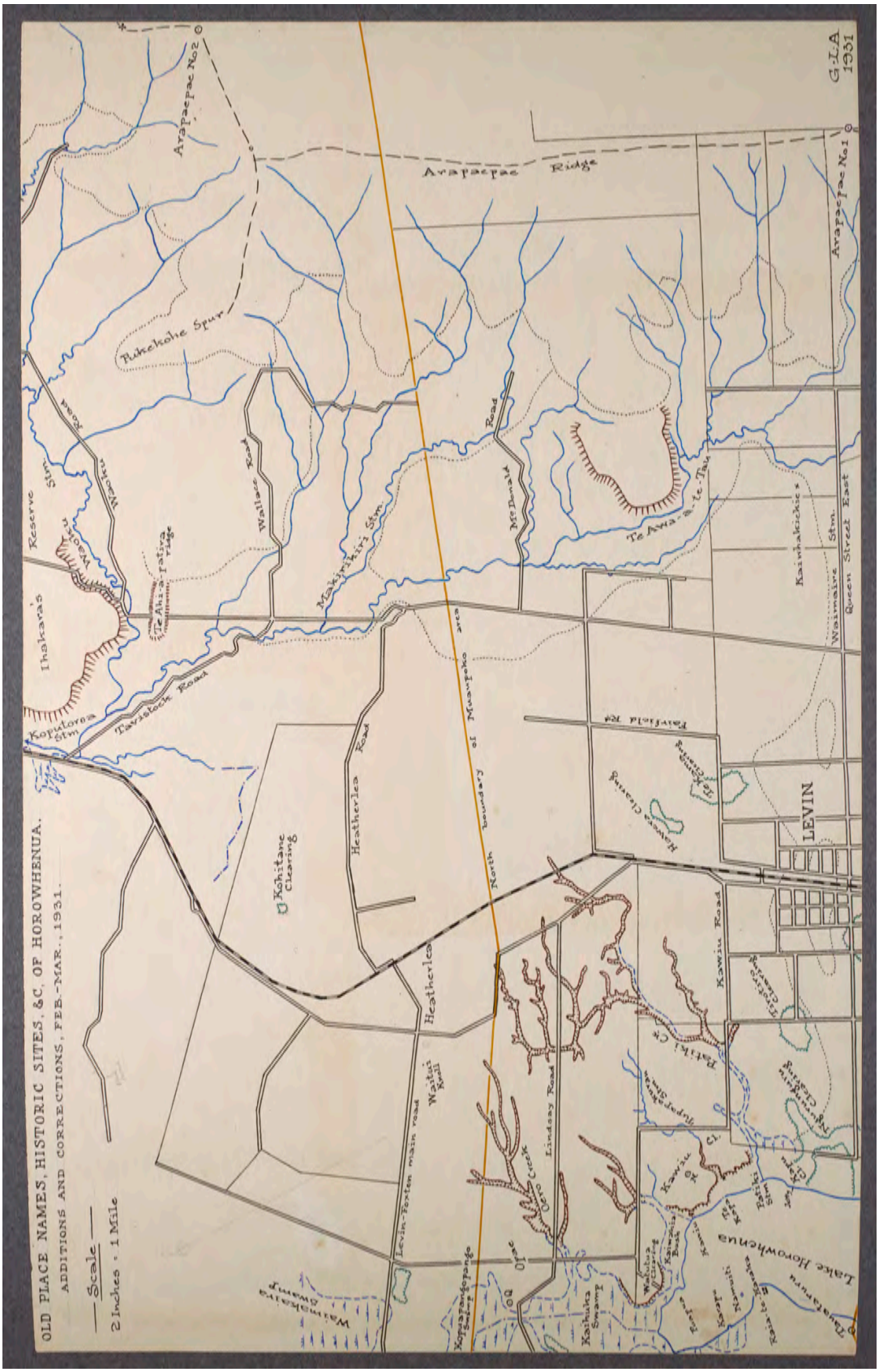
Alexander Turnbull Library, Adkin Album 13, PA1-q-002-11-map, Image opposite page 11.



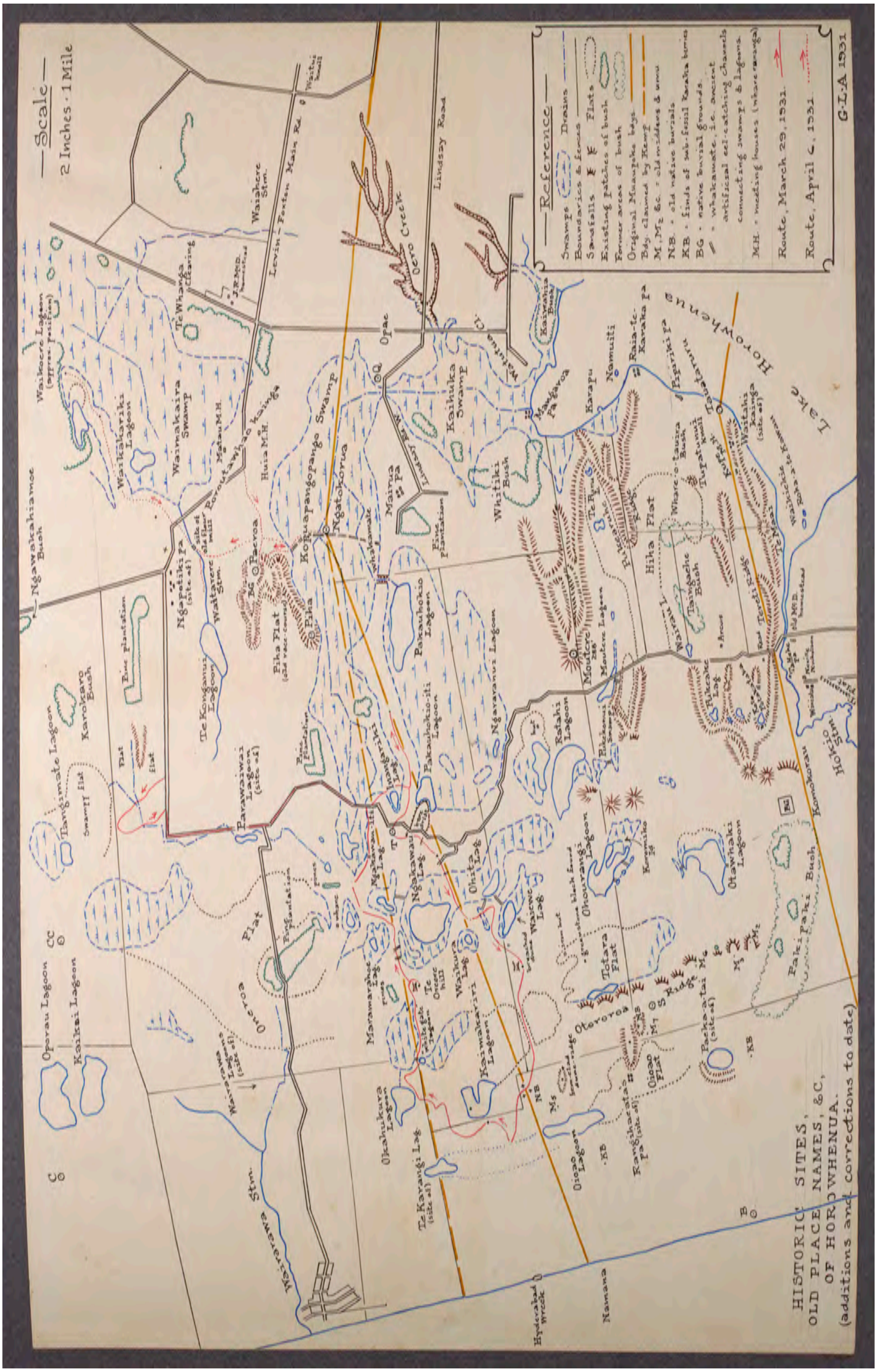
Alexander Turnbull Library, Adkin Album 13, PA1-q-002-15-map, Image opposite page 15.



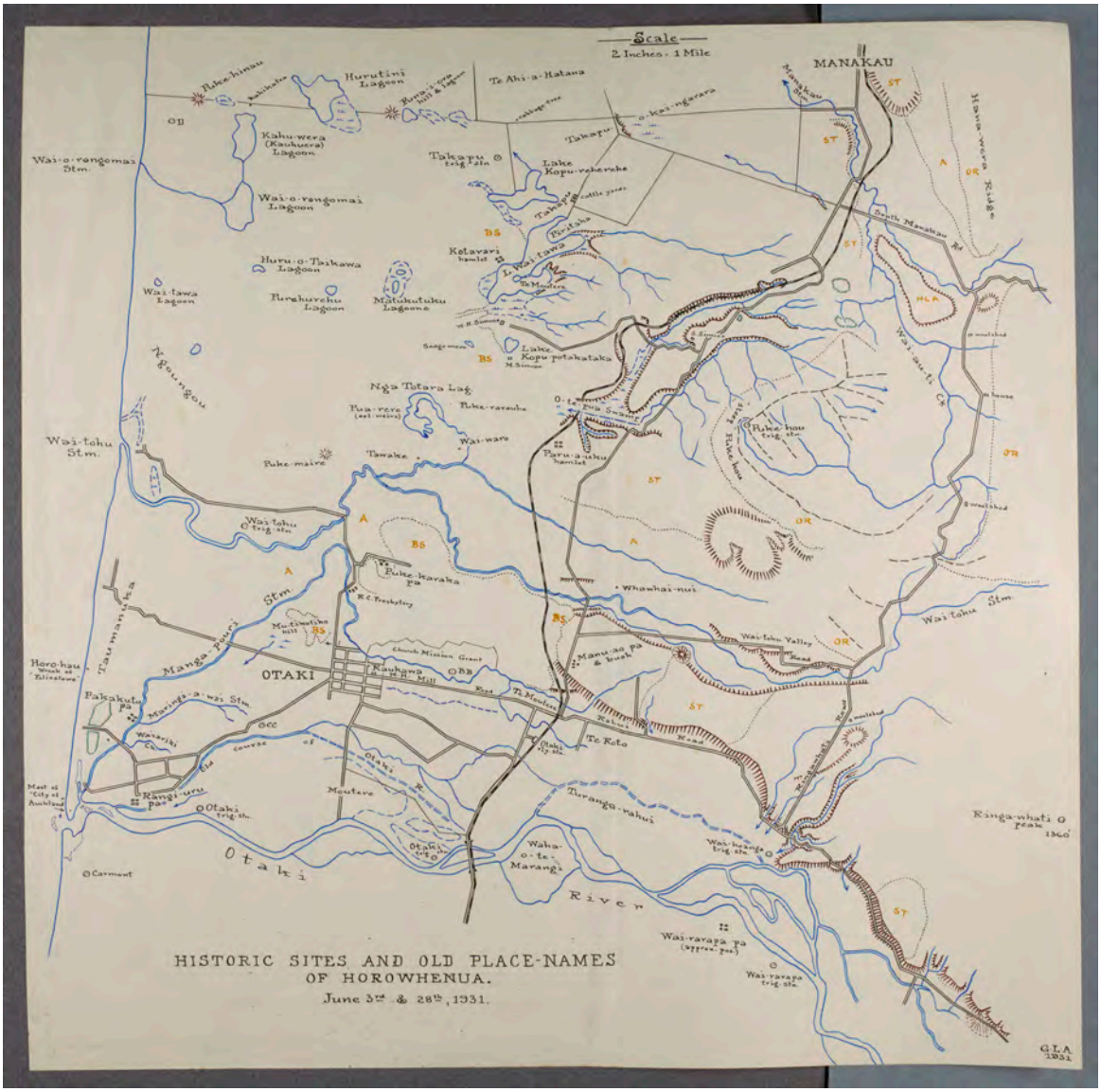
Alexander Turnbull Library, Adkin Album 13, PA1-q-002-19-map, Image opposite page 19.



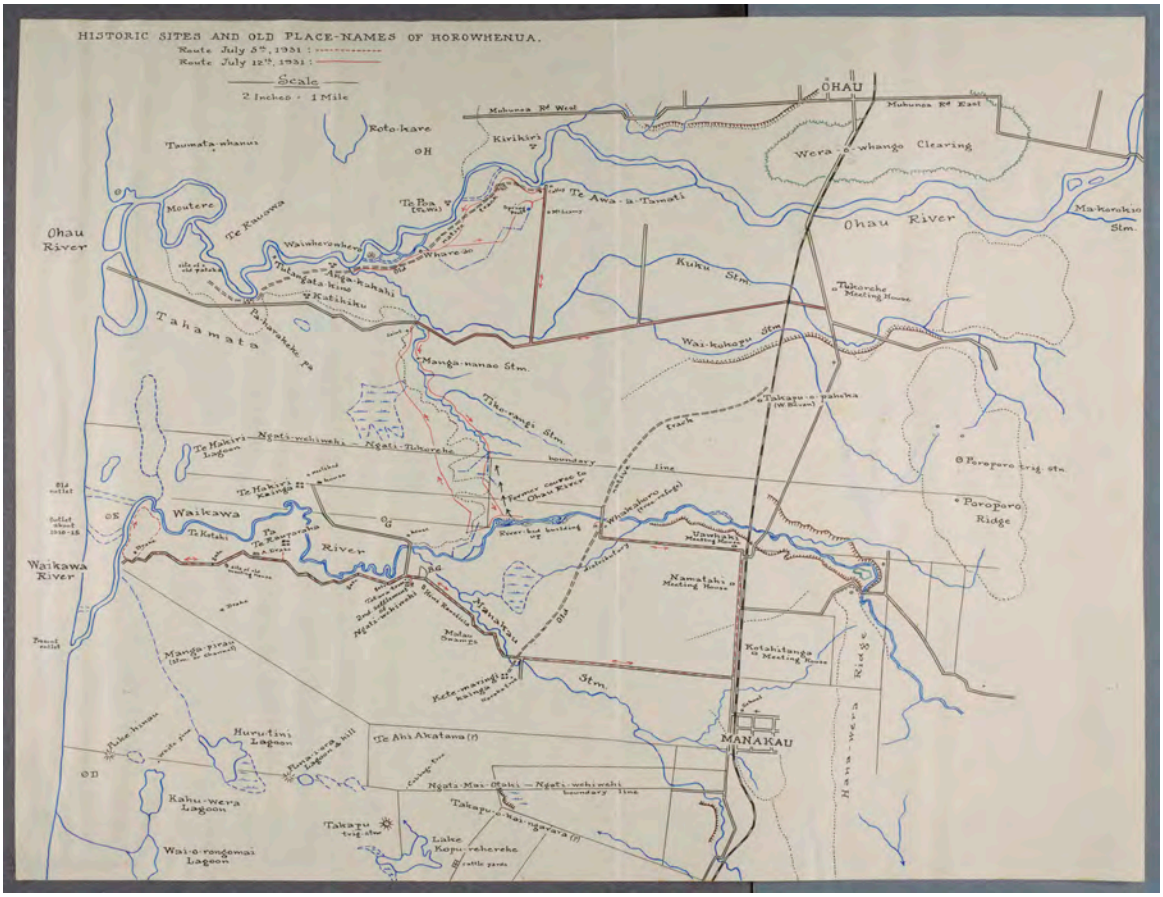
Alexander Turnbull Library, Adkin Album 13, PA1-q-002-21-map, Image opposite page 21.



Alexander Turnbull Library, Adkin Album 13, PA1-q-002-23-map, Image opposite page 23.



Alexander Turnbull Library, Adkin Album 13, PA1-q-002-26-map, Image opposite page 26.



Alexander Turnbull Library, Adkin Album 13, PA1-q-002-27-map, Image opposite page 27.

Alexander Turnbull Library, Adkin Album 13, PA1-q-002-30-31-map, Image opposite page 30.

Maps by GL Adkin:

The following 12 maps are reproductions of the black and white maps drawn by G.L. Adkin in 1948.[1508]

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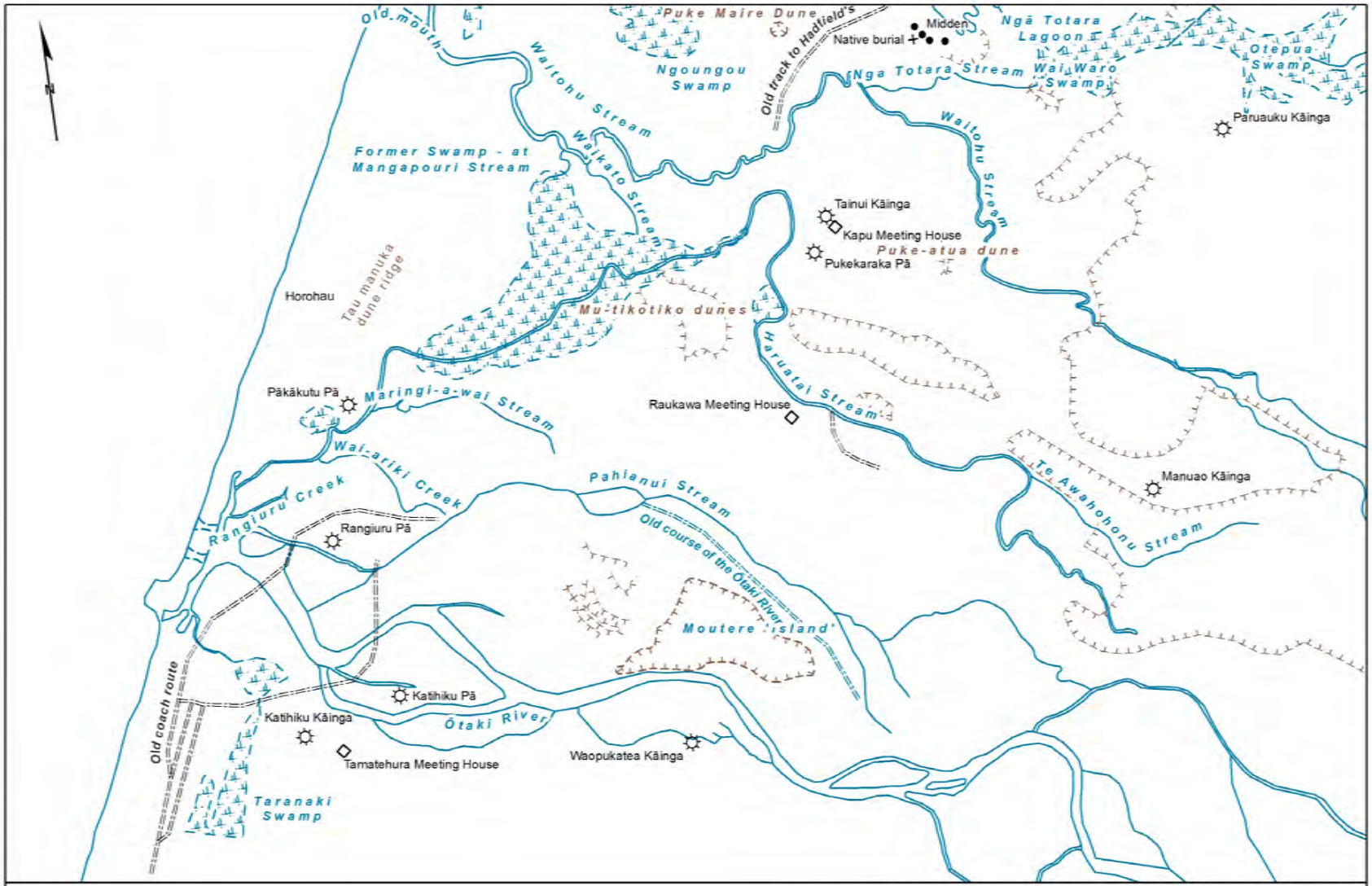
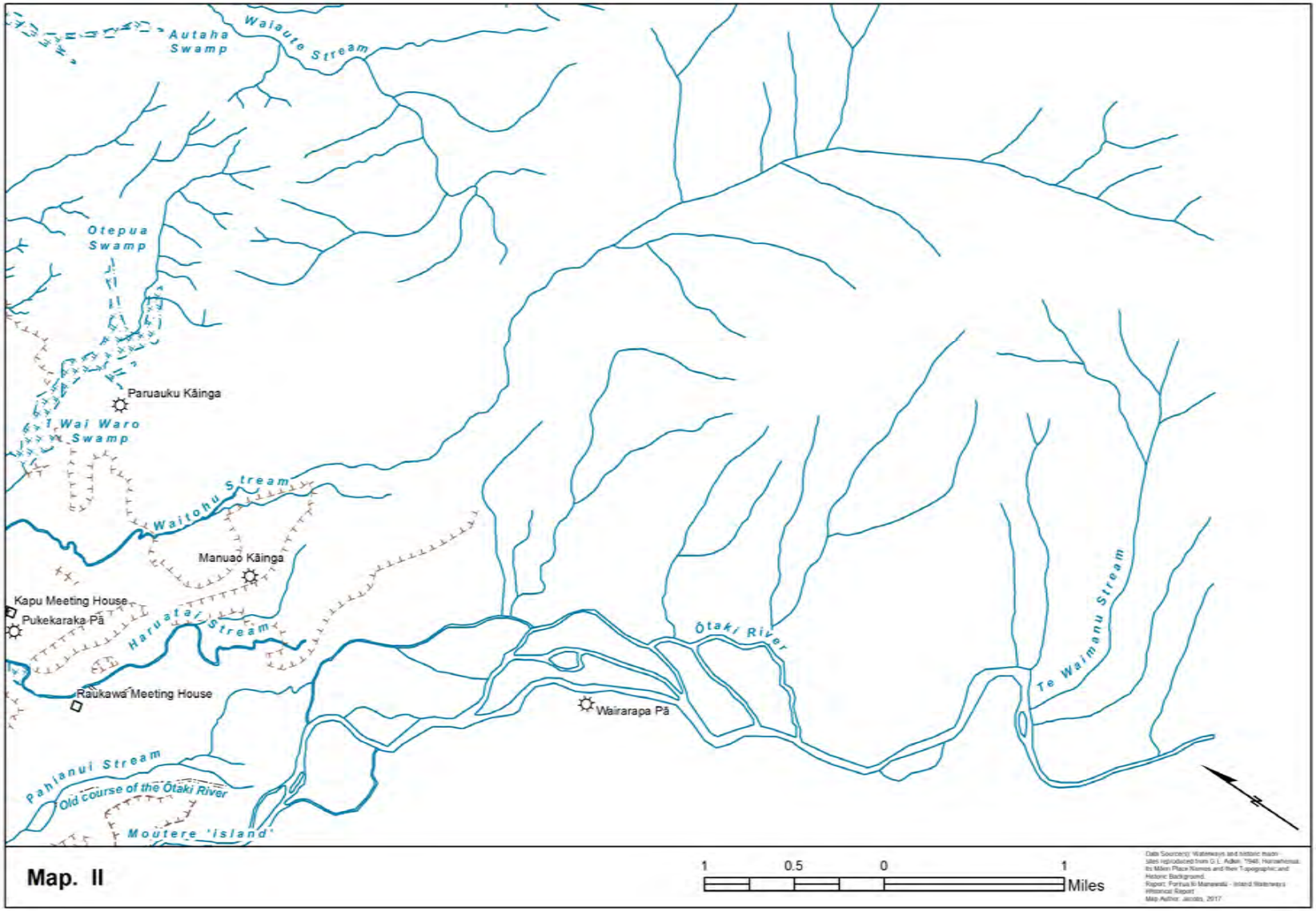
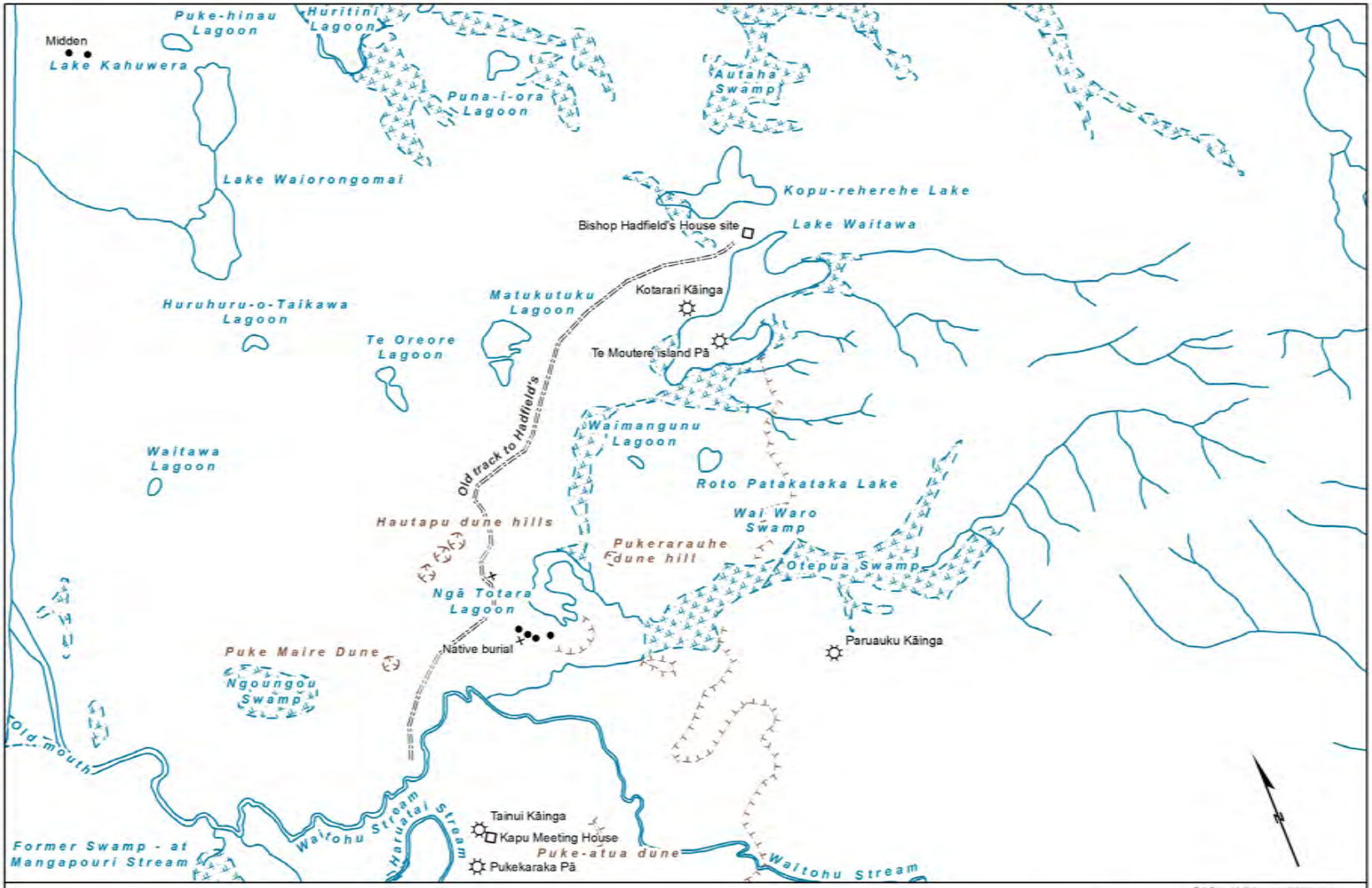
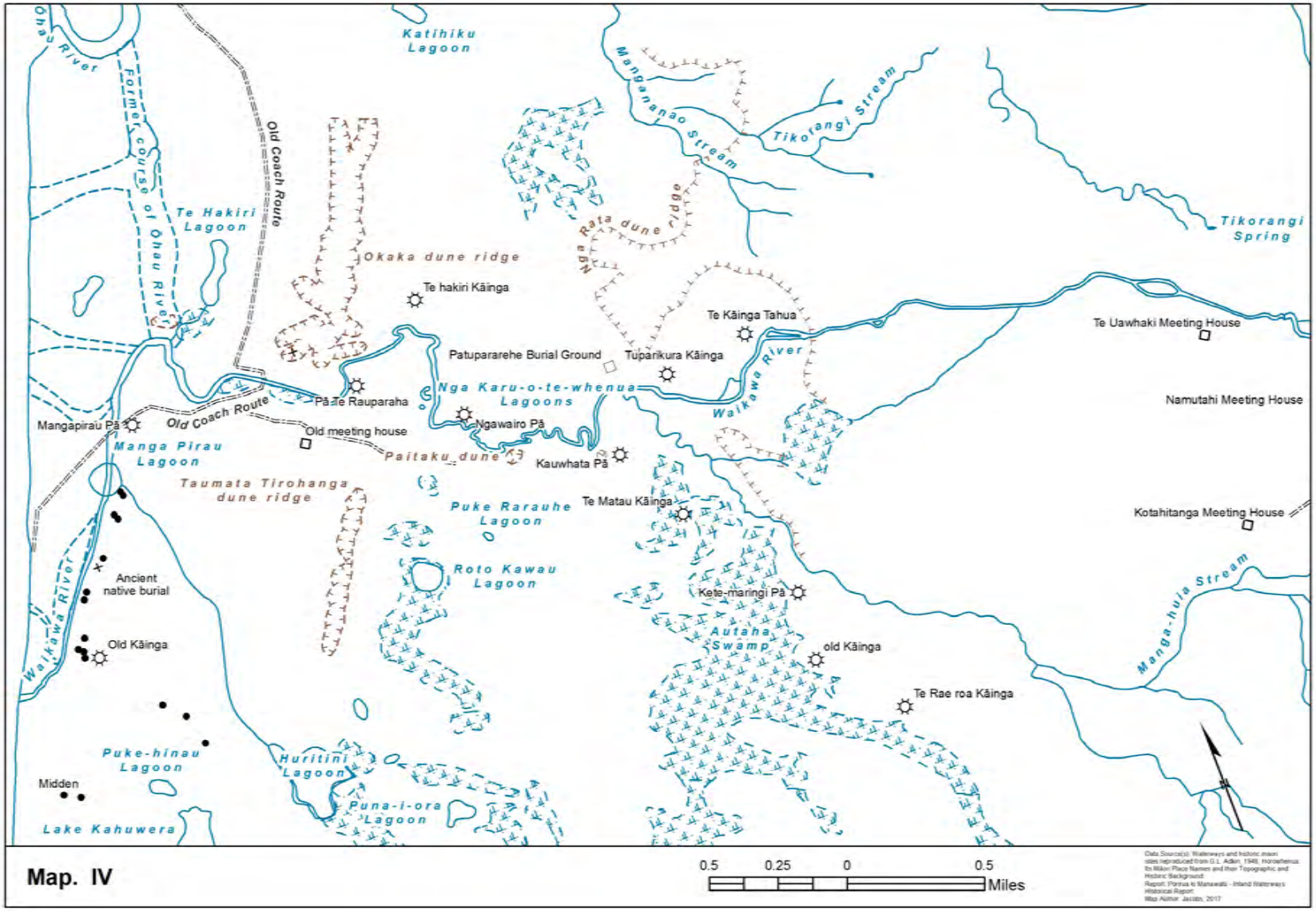
[1508] G Adkin, Horowhenua: Its Māori Place Names and their Topographic and Historical Background. (Department of Internal Affairs: Wellington, 1948), appendices.

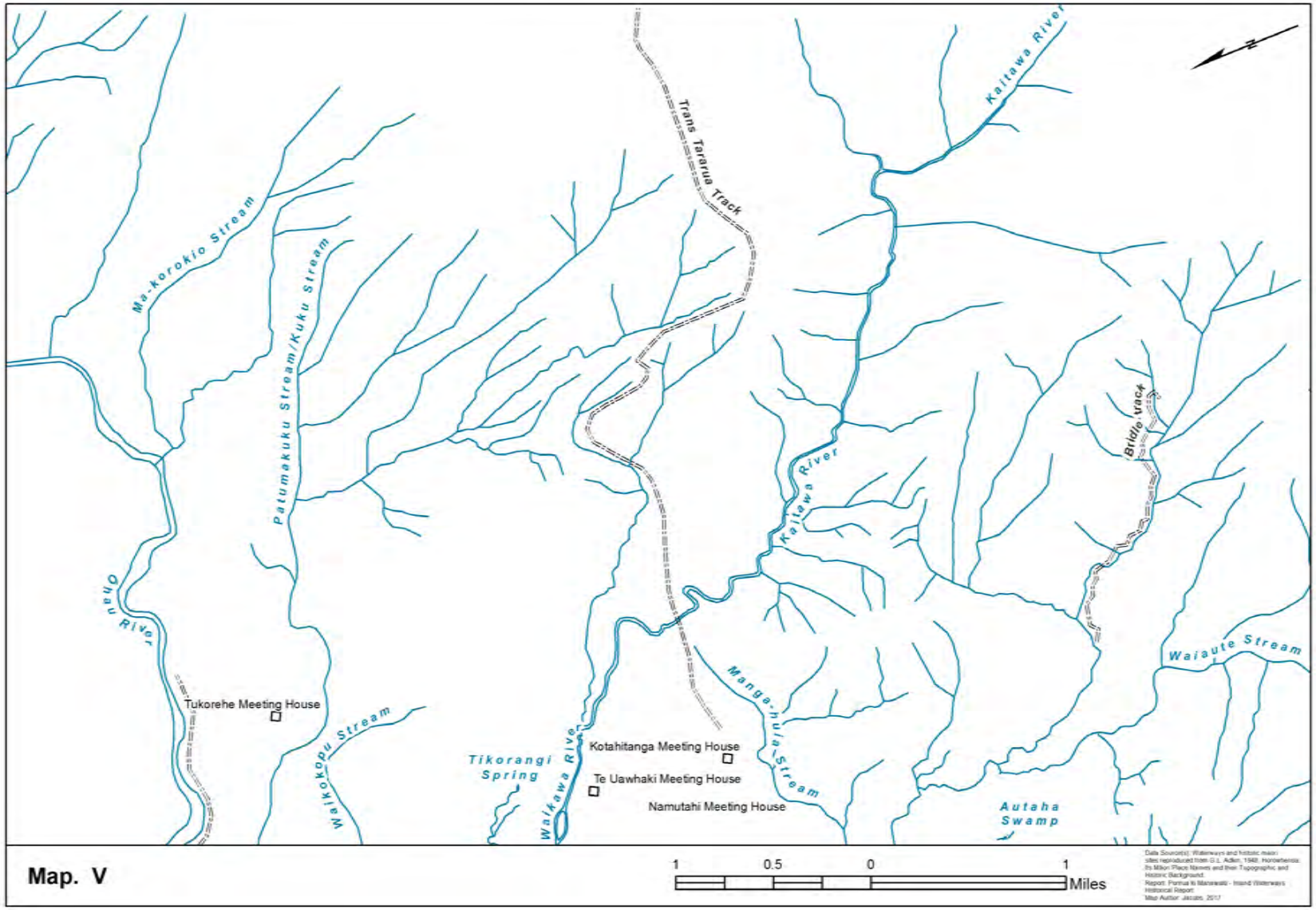

Old mouth
Waitohu Stream
Puke Maire Dune
Ngoungou Swamp
Old track to Hadfield's
Midden
Native burial
Ngā Totara Lagoon
Otepua Swamp
Nga Totara Stream
Wai Waro Swamp
Paruauku Kāinga
Waitohu Stream
Former Swamp - at Mangapouri Stream
Waikato Stream
Tainui Kāinga
Kapu Meeting House
Puke-atua dune
Pukekaraka Pā
Horohau
Tau manuka dune ridge
Mu-tikotiko dunes
Haruatai Stream
Pākākutu Pā
Maringi-a-wai Stream
Raukawa Meeting House
Wai-ariki Creek
Rangiuru Creek
Pahianui Stream
Manuao Kāinga
Te Awahohonu Stream
Rangiuru Pā
Old course of the Ōtaki River
Moutere 'island'
Old coach route
Katihiku Pā
Katihiku Kāinga
Ōtaki River
Tamatehura Meeting House
Waopukatea Kāinga
Taranaki Swamp
Map. I
0.5
0.25
0
0.5
Miles

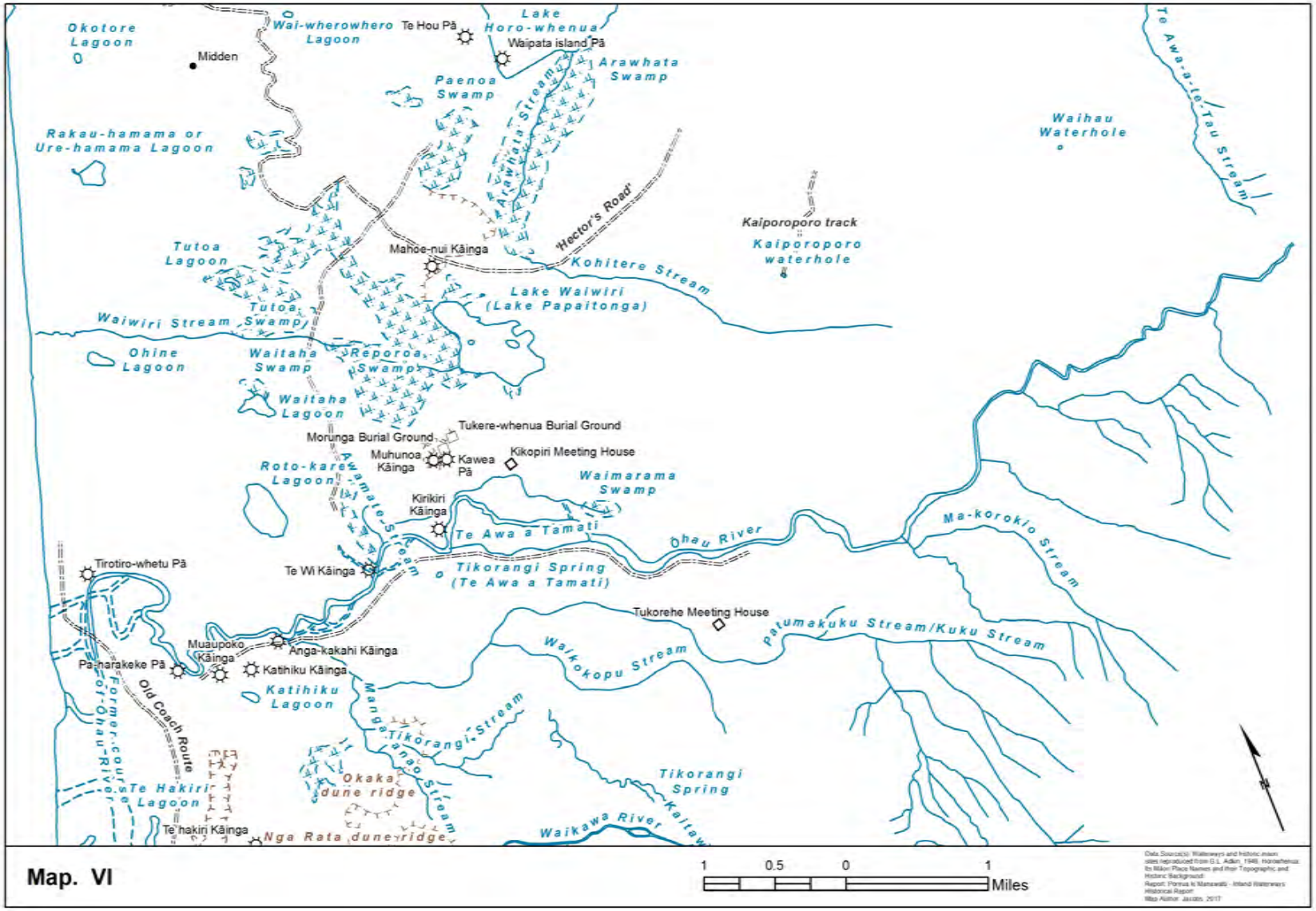

Autaha Swamp
Waiaute Stream
Otepua Swamp
Paruauku Kāinga
Wai Waro Swamp
Waitohu Stream
Manuao Kāinga
Kapu Meeting House
Pukekaraka Pā
Haruatai Stream
Raukawa Meeting House
Ōtaki River
Te Waimanu Stream
Wairarapa Pā
Pahianui Stream
Old course of the Ōtaki River
Moutere 'island'
1 0.5 0 1
Miles

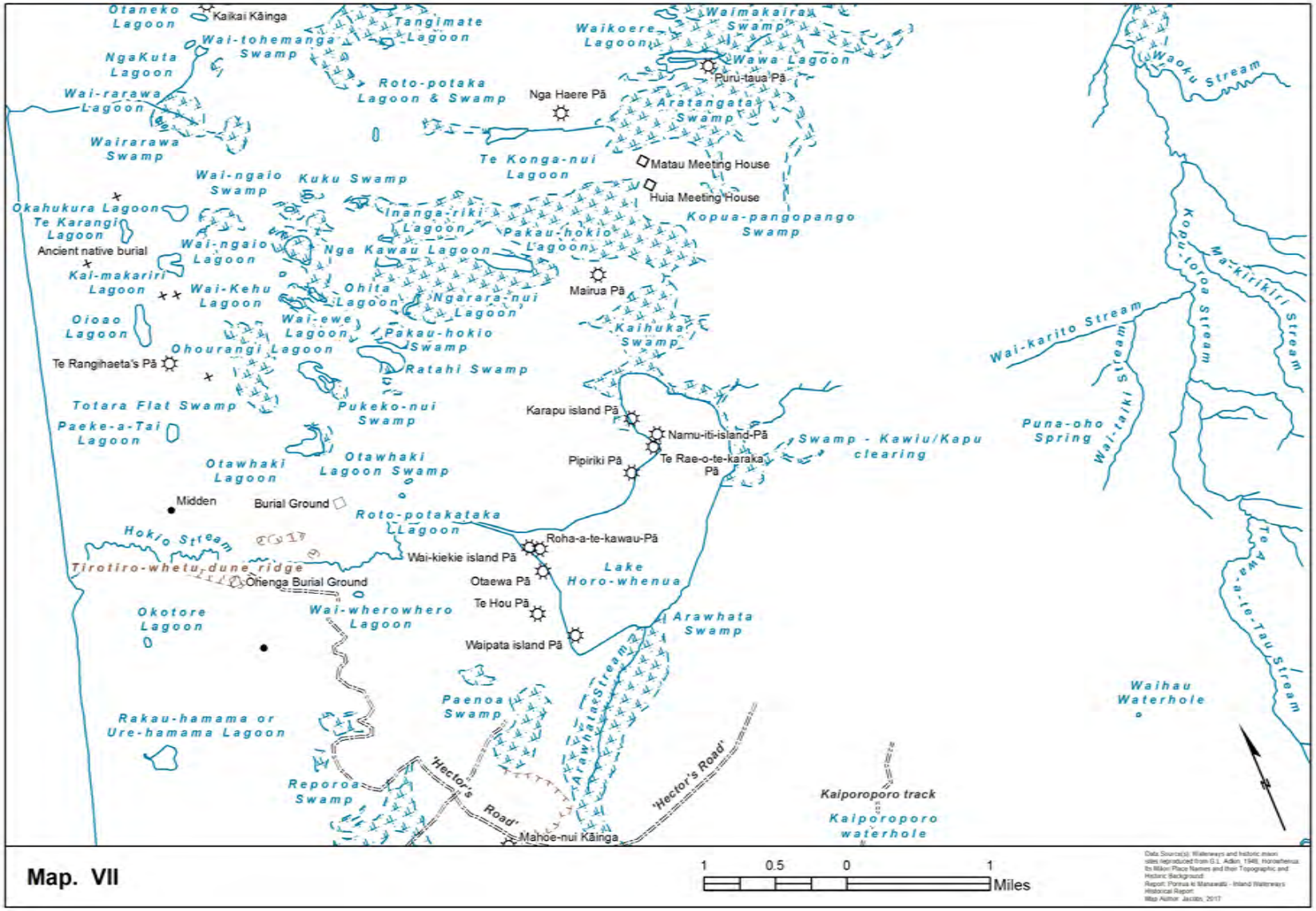
Map. II

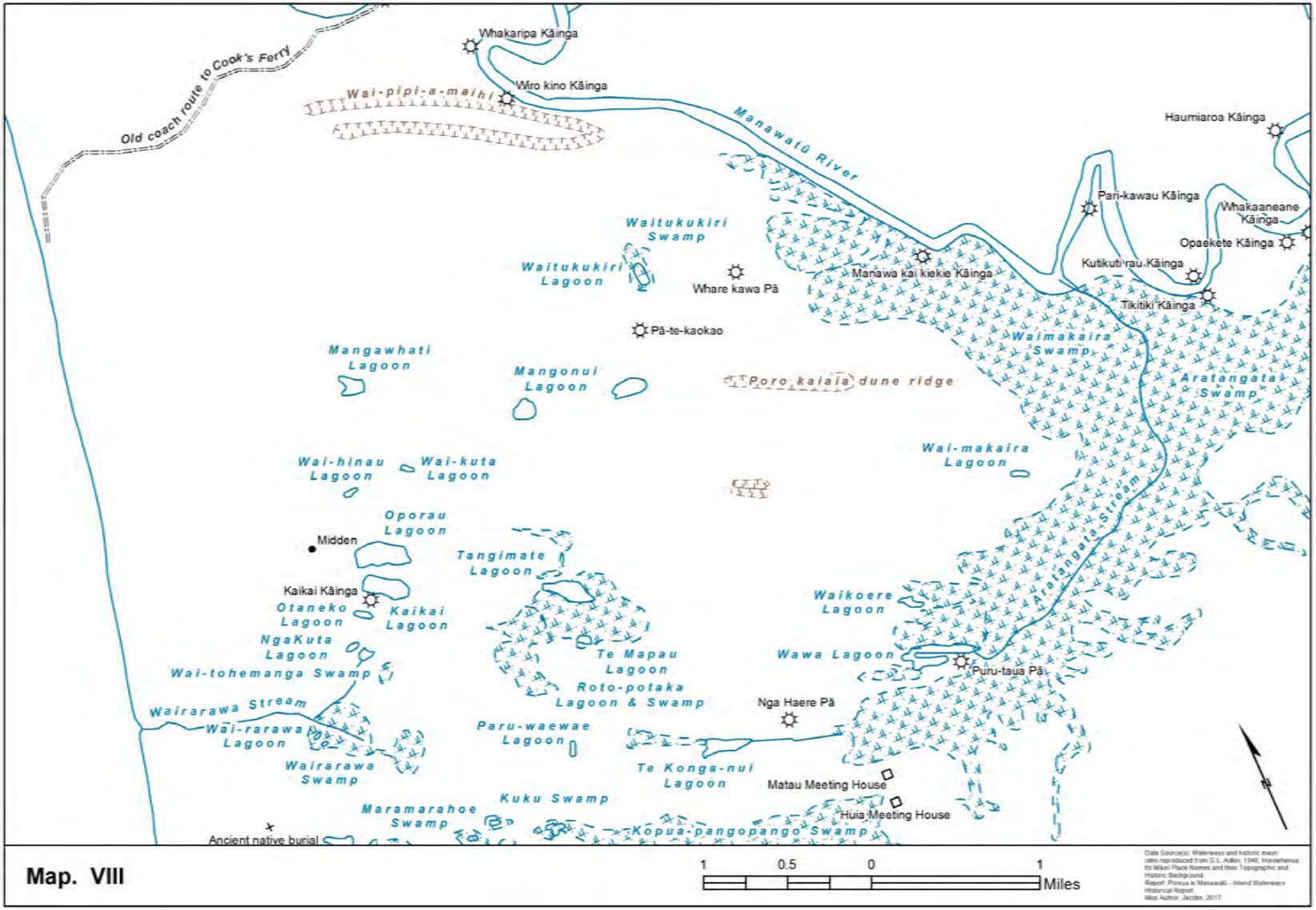

Midden
Lake Kahuwera
Puke-hinau Lagoon
Huritini Lagoon
Puna-i-ora Lagoon
Autaha Swamp
Lake Waiorongomai
Kopu-rehereh e Lake
Bishop Hadfield's House site
Lake Waitawa
Kotarari Kāinga
Matukutuku Lagoon
Huruhuru-o-Taikawa Lagoon
Te Oreore Lagoon
Te Moutere island Pā
Old track to Hadfield's
Waimangunu Lagoon
Waitawa Lagoon
Roto Patakataka Lake
Wai Waro Swamp
Hautapu dune hills
Pukerarauhe dune hill
Otepua Swamp
Ngā Totara Lagoon
Native burial
Paruauku Kāinga
Puke Maire Dune
Ngoungou Swamp
Old mouth
Former Swamp - at Mangapouri Stream
Waitohu Stream
Hariatai Stream
Tainui Kāinga
Kapu Meeting House
Puke-atua dune
Pukekaraka Pā
Waitohu Stream
Map. III
0.6 0.3 0 0.6
Miles

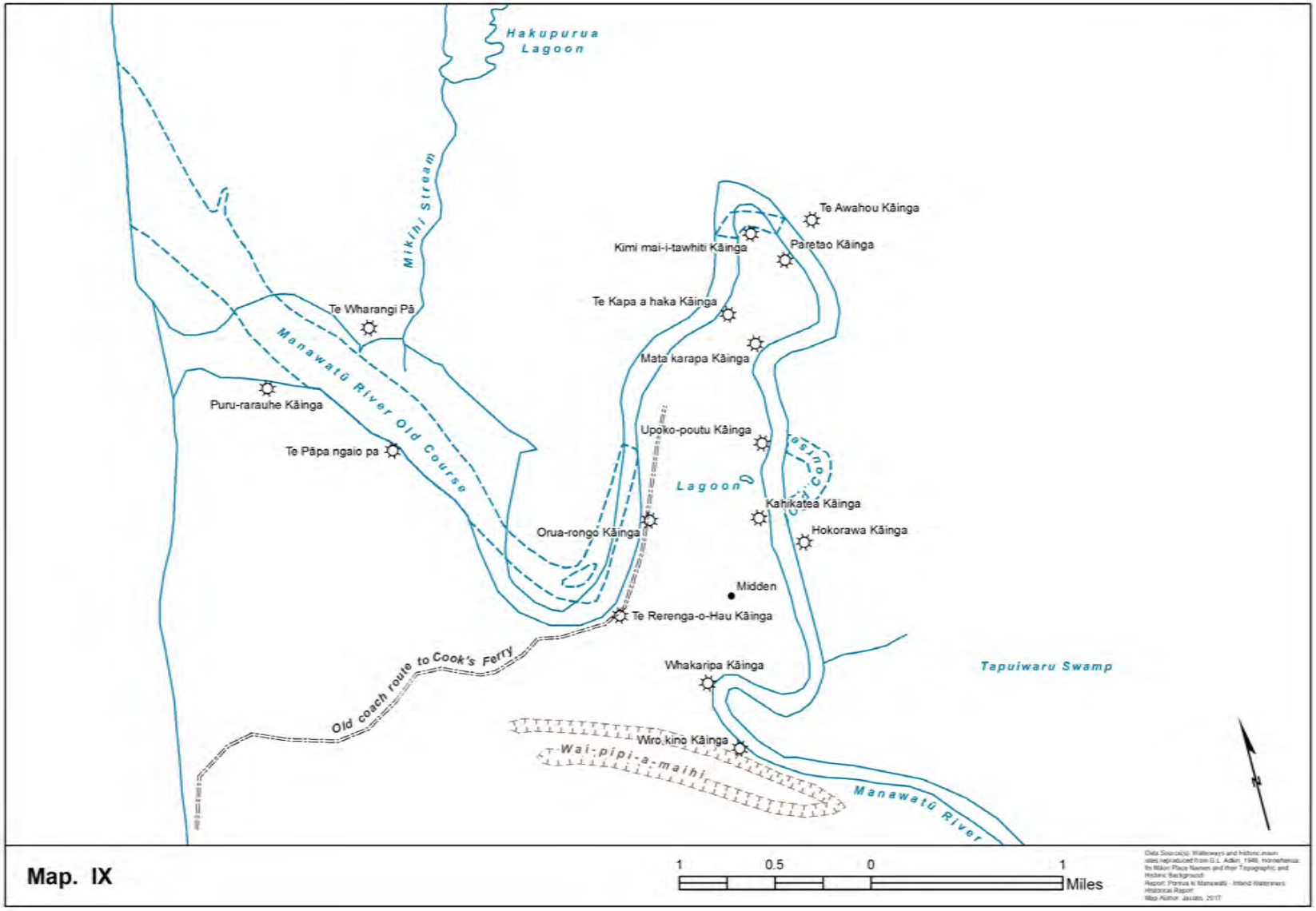

Ohau River
Former course of Ohau River
Old Coach Route
Katihiku Lagoon
Te Hakiri Lagoon
Okaka dune ridge
Te hakiri Kāinga
Mangananao Stream
Tikorangi Stream
Nga Rata dune ridge
Tikorangi Spring
Te Kāinga Tahua
Te Uawhaki Meeting House
Patupararehe Burial Ground
Tuparikura Kāinga
Pā Te Rauparaha
Nga Karu-o-te-whenua Lagoons
Waikawa River
Namutahi Meeting House
Mangapirau Pā
Old Coach Route
Ngawairo Pā
Old meeting house
Manga Pirau Lagoon
Paitaku dune
Kauwhata Pā
Taumata Tirohanga dune ridge
Puke Rarauhe Lagoon
Te Matau Kāinga
Kotahitanga Meeting House
Roto Kawau Lagoon
Ancient native burial
Waikawa River
Kete-maringi Pā
Manga-huia Stream
Autaha Swamp
old Kāinga
Old Kāinga
Te Rae roa Kāinga
Puke-hinau Lagoon
Huritini Lagoon
Midden
Puna-i-ora Lagoon
Lake Kahuwera
Map. IV
0.5 0.25 0 0.5
Miles

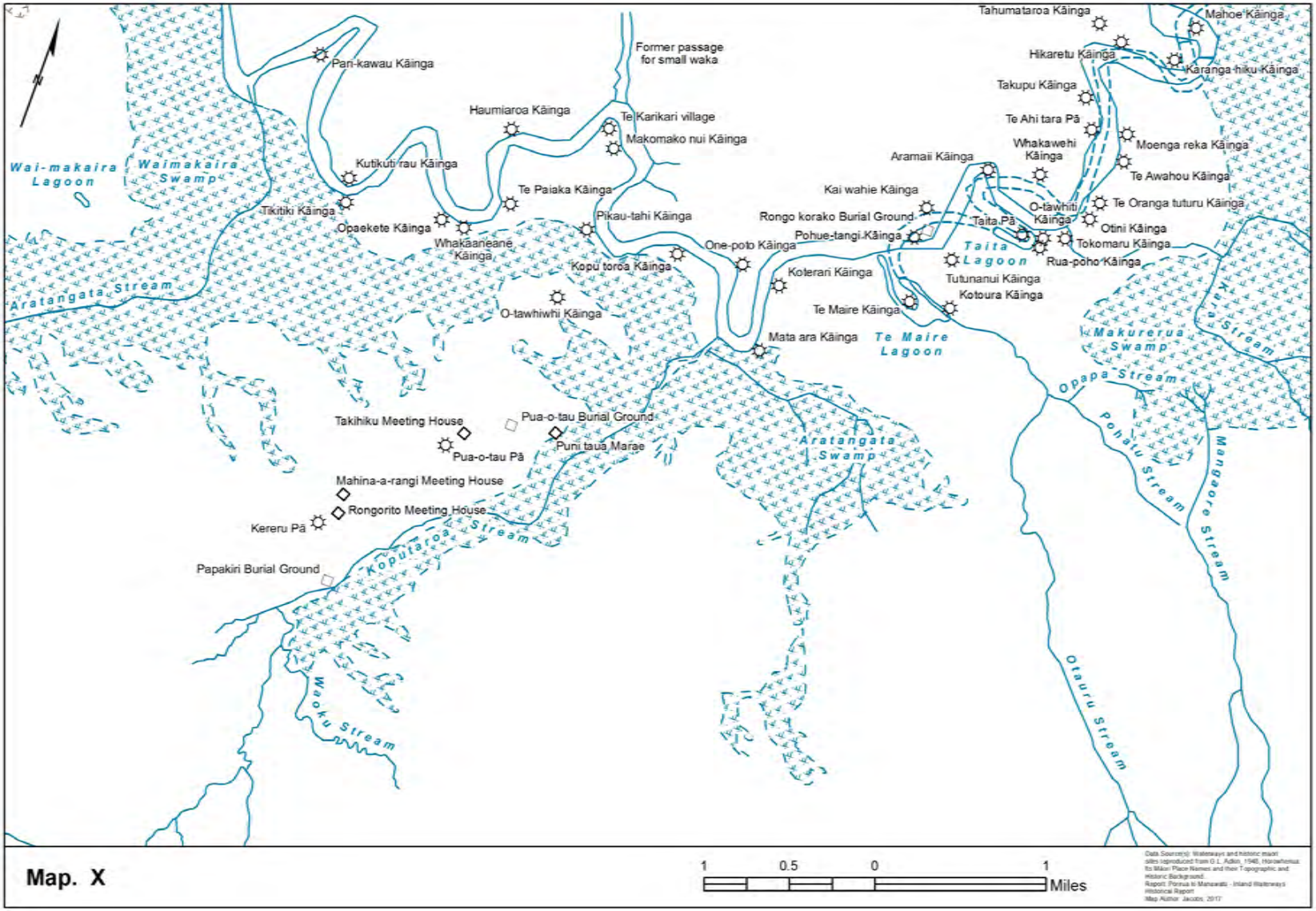

Ma-korokio Stream
Patumakuku Stream/Kuku Stream
Trans Tararua Track
Kaitawa River
Bridle track
Kaitawa River
Onau River
Tukorehe Meeting House
Waikokopu Stream
Tikorangi Spring
Waikawa River
Kotahitanga Meeting House
Te Uawhaki Meeting House
Namutahi Meeting House
Manga-hua Stream
Autaha Swamp
Waiaute Stream
Map. V
1
0.5
0
1
Miles

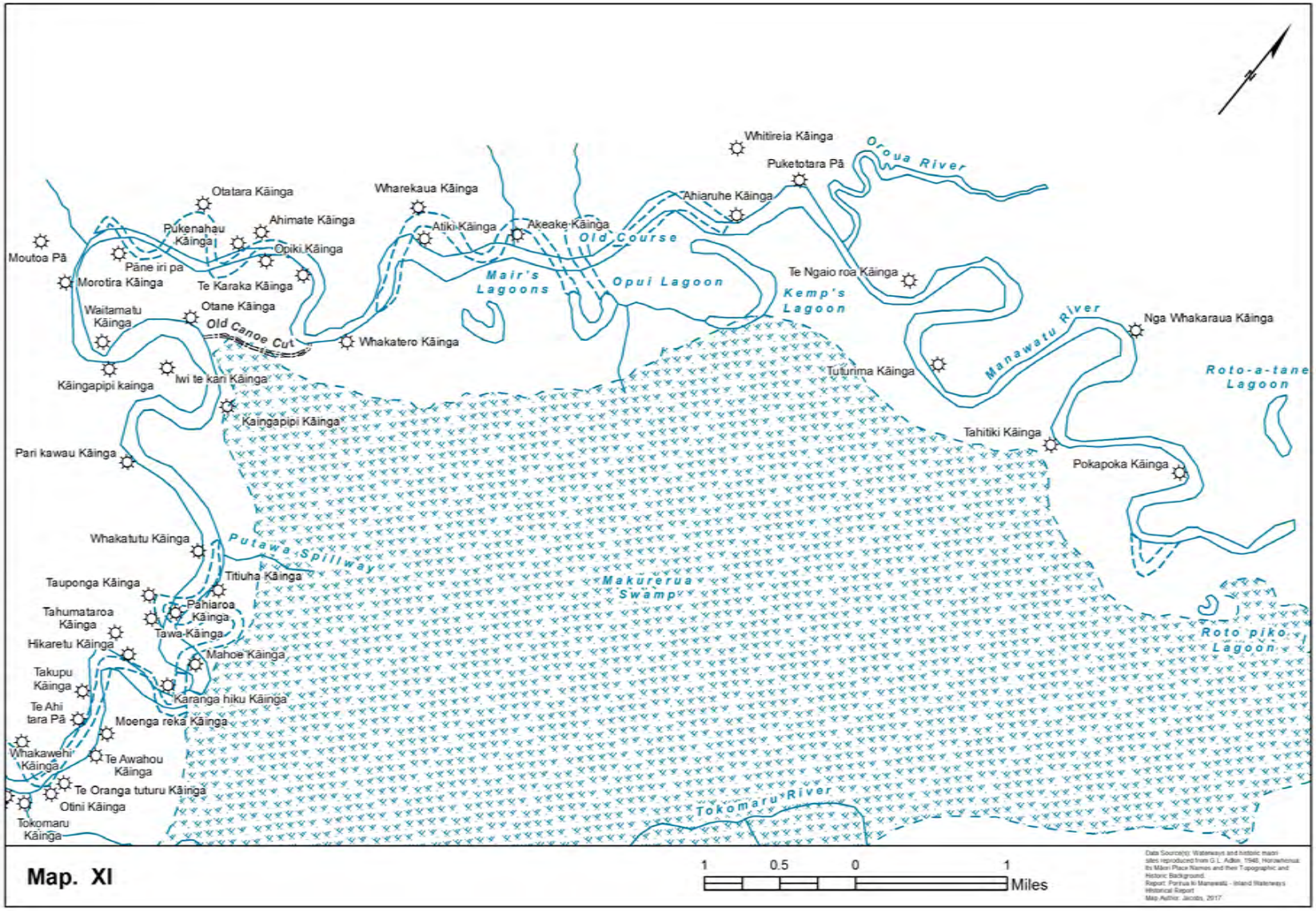

Okotore Lagoon
Wai-wherowhero Lagoon
Te Hou Pā
Lake Horo-whenua
Midden
Waipata island Pā
Arawhata Swamp
Paenoa Swamp
Arawhata Stream
Rakau-hamama or Ure-hamama Lagoon
Waihau Waterhole
Te Awa-a-te-Tau Stream
'Hector's Road'
Kaiporoporo track
Kaiporoporo waterhole
Tutoa Lagoon
Mahoe-nui Kāinga
Kohitere Stream
Lake Waiwiri (Lake Papaitonga)
Tutoa Swamp
Waiwiri Stream
Ohine Lagoon
Waitaha Swamp
Reporoa Swamp
Waitaha Lagoon
Tukere-whenua Burial Ground
Morunga Burial Ground
Muhunoa Kāinga
Kawea Pā
Kikopiri Meeting House
Roto-kare Lagoon
Waimarama Swamp
Kirikiri Kāinga
Te Awa a Tamati
Ohau River
Ma-koroki'o Stream
Tirotiro-whetu Pā
Te Wi Kāinga
Tikorangi Spring (Te Awa a Tamati)
Tukorehe Meeting House
patumakuku Stream/Kuku Stream
Muaupoko Kāinga
Anga-kakahi Kāinga
Pā-harakeke Pā
Katihiku Kāinga
Waikokopu Stream
Katihiku Lagoon
Old Coach Route
Former course of Ohau River
Manga-a-Tikorangi Stream
Okaka dune ridge
Tikorangi Spring
Te Hakiri Lagoon
Te hakiri Kāinga
Nga Rata dune ridge
Waikawa River
Map. VI
1 0.5 0 1 Miles


Otaneko Lagoon
Kaikai Kāinga
Tangimate Lagoon
Wai-tohemanga Swamp
NgaKuta Lagoon
Wai-rarawa Lagoon
Wairarawa Swamp
Roto-potaka Lagoon & Swamp
Nga Haere Pā
Waikoere Lagoon
Waimakaira Swamp
Wawa Lagoon
Puru-taua Pā
Aratangata Swamp
Te Konga-nui Lagoon
Matau Meeting House
Huia Meeting House
Kopua-pangopango Swamp
Waoku Stream
Kopu-toroa Stream
Ma-kirikiri Stream
Wai-ngaio Swamp
Kuku Swamp
Okahukura Lagoon
Te Karangi Lagoon
Ancient native burial
Wai-ngaio Lagoon
Inanga-riki Lagoon
Pakau-hokio Lagoon
Nga Kawau Lagoon
Kai-makariri Lagoon
Wai-Kehu Lagoon
Ohita Lagoon
Ngarara-nui Lagoon
Mairua Pā
Kaihuka Swamp
Oioao Lagoon
Wai-ewe Lagoon
Pakau-hokio Swamp
Ohourangi Lagoon
Te Rangihaeta's Pā
Ratahi Swamp
Wai-karito Stream
Totara Flat Swamp
Pukeko-nui Swamp
Karapu island Pā
Paeke-a-Tai Lagoon
Namu-iti-island-Pā
Swamp - Kawiu/Kapu clearing
Puna-oho Spring
Wai-taiki Stream
Otawhaki Lagoon
Otawhaki Lagoon Swamp
Pipiriki Pā
Te Rae-o-te-karaka Pā
Midden
Burial Ground
Roto-potakataka Lagoon
Hoki'o Stream
Roha-a-te-kawau-Pā
Wai-kiekie island Pā
Tirotiro-whetu dune ridge
Otienga Burial Ground
Otaewa Pā
Lake Horo-whenua
Te Hou Pā
Okotore Lagoon
Wai-wherowhero Lagoon
Arawhata Swamp
Waipata island Pā
Arawhata Stream
Paenoa Swamp
Waihau Waterhole
Rakau-hamama or Ure-hamama Lagoon
'Hector's Road'
Reporoa Swamp
Kaiporoporo track
Kaiporoporo waterhole
Mahoe-nui Kāinga
Map. VII
1 0.5 0 1
Miles


Old coach route to Cook's Ferry
Whakaripa Kāinga
Wiro kino Kāinga
Wai-pipi-a-maihi
Manawatū River
Haumiaroa Kāinga
Pari-kawau Kāinga
Whakaaneane Kāinga
Opaekete Kāinga
Kutikuti rau Kāinga
Tikitiki Kāinga
Manawa kai kiekie Kāinga
Waitukukiri Swamp
Waitukukiri Lagoon
Whare kawa Pā
Pā-te-kaokao
Waimakaira Swamp
Aratangata Swamp
Mangawhati Lagoon
Mangonui Lagoon
Poro kaiaia dune ridge
Wai-makaira Lagoon
Wai-hinau Lagoon
Wai-kuta Lagoon
Oporau Lagoon
Midden
Tangimate Lagoon
Aratangata Stream
Kaikai Kāinga
Otaneko Lagoon
Kaikai Lagoon
Waikoere Lagoon
NgaKuta Lagoon
Te Mapau Lagoon
Wawa Lagoon
Puiru-taua Pā
Wai-tohemanga Swamp
Roto-potaka Lagoon & Swamp
Nga Haere Pā
Wairarawa Stream
Wai-rarawa Lagoon
Paru-waewae Lagoon
Te Konga-nui Lagoon
Matau Meeting House
Wairarawa Swamp
Kuku Swamp
Huia Meeting House
Maramarahoe Swamp
Ancient native burial
Kopua-pangopango Swamp
Map. VIII
1 0.5 0 1
Miles


Hakupurua Lagoon
Mikini Stream
Te Awahou Kāinga
Kimi mai-i-tawhiti Kāinga
Paretao Kāinga
Te Kapa a haka Kāinga
Te Wharangi Pā
Mata karapa Kāinga
Manawatū River Old Course
Puru-rarauhe Kāinga
Upoko-poutu Kāinga
Te Pāpa ngaio pa
Lagoon
Kahikatea Kāinga
Orua-rongo Kāinga
Hokorawa Kāinga
Midden
Te Rerenga-o-Hau Kāinga
Whakaripa Kāinga
Tapuiwaru Swamp
Old coach route to Cook's Ferry
Wiro kino Kāinga
Wai-pipi-a-maihi
Manawatū River
Map. IX
1 0.5 0 1 Miles


Tahumataroa Kāinga
Mahoe Kāinga
Hikaretu Kāinga
Karanga-hiku Kāinga
Takupu Kāinga
Te Ahi tara Pā
Whakawehi Kāinga
Moenga reka Kāinga
Aramaii Kāinga
Te Awahou Kāinga
Kai wahie Kāinga
O-tawhiti Kāinga
Te Oranga tuturu Kāinga
Rongo korako Burial Ground
Taita Pā
Otini Kāinga
Pohue-tangi Kāinga
Tokomaru Kāinga
Taita Lagoon
Rua-poho Kāinga
Koterari Kāinga
Tutunanui Kāinga
Kotoura Kāinga
Te Maire Kāinga
Te Maire Lagoon
Mata ara Kāinga
Makurerua Swamp
Karaka Stream
Opapa Stream
Pohatu Stream
Maungaroa Stream
Aratangata Swamp
Otauru Stream
Former passage for small waka
Pan-kawau Kāinga
Haumiaroa Kāinga
Te Karikari village
Makomako nui Kāinga
Kutikuti rau Kāinga
Wai-makaira Lagoon
Waimakaira Swamp
Te Paiaka Kāinga
Tikitiki Kāinga
Pikau-tahi Kāinga
Opaekete Kāinga
Whakaaneane Kāinga
One-poto Kāinga
Kopu toroa Kāinga
Aratangata Stream
O-tawhiwhi Kāinga
Takihiku Meeting House
Pua-o-tau Burial Ground
Pua-o-tau Pā
Puni taua Marae
Mahina-a-rangi Meeting House
Rongorito Meeting House
Kereru Pā
Koputaroa Stream
Papakiri Burial Ground
Maoku Stream
Map. X
1
0.5
0
1
Miles


Whitireia Kāinga
Oroua River
Puketotara Pā
Ahiaruhe Kāinga
Wharekaua Kāinga
Otatara Kāinga
Ahimate Kāinga
Pukenahau Kāinga
Atiki Kāinga
Akeake Kāinga
Old Course
Moutoa Pā
Pāne iri pa
Opiki Kāinga
Morotira Kāinga
Te Karaka Kāinga
Mair's Lagoons
Opui Lagoon
Te Ngaio roa Kāinga
Kemp's Lagoon
Waitarnatu Kāinga
Otane Kāinga
Old Canoe Cut
Whakatero Kāinga
Manawatu River
Nga Whakaraua Kāinga
Roto-a-tane Lagoon
Kāingapipi kainga
Iwi te kari Kāinga
Tuturima Kāinga
Kaingapipi Kāinga
Tahitiki Kāinga
Pari kawau Kāinga
Pokapoka Kāinga
Whakatutu Kāinga
Putawa Spillway
Titiuha Kāinga
Makurerua Swamp
Tauponga Kāinga
Pahiaroa Kāinga
Tahumataroa Kāinga
Tawa Kāinga
Roto piko Lagoon
Hikaretu Kāinga
Mahoe Kāinga
Takupu Kāinga
Karanga hiku Kāinga
Te Ahi tara Pā
Moenga reka Kāinga
Whakawehi Kāinga
Te Awahou Kāinga
Te Oranga tuturu Kāinga
Otini Kāinga
Tokomaru River
Tokomaru Kāinga
Map. XI
1
0.5
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1
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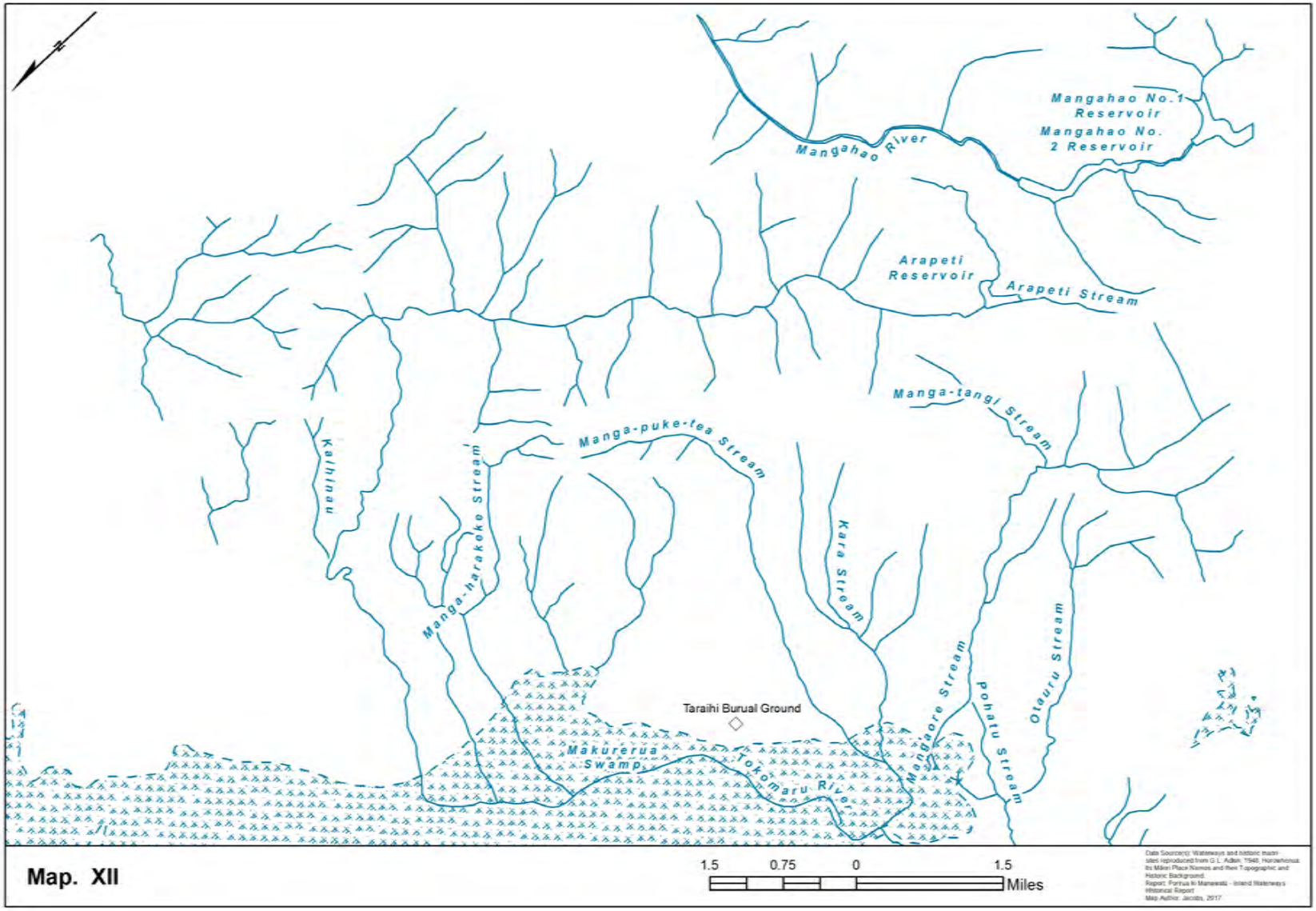
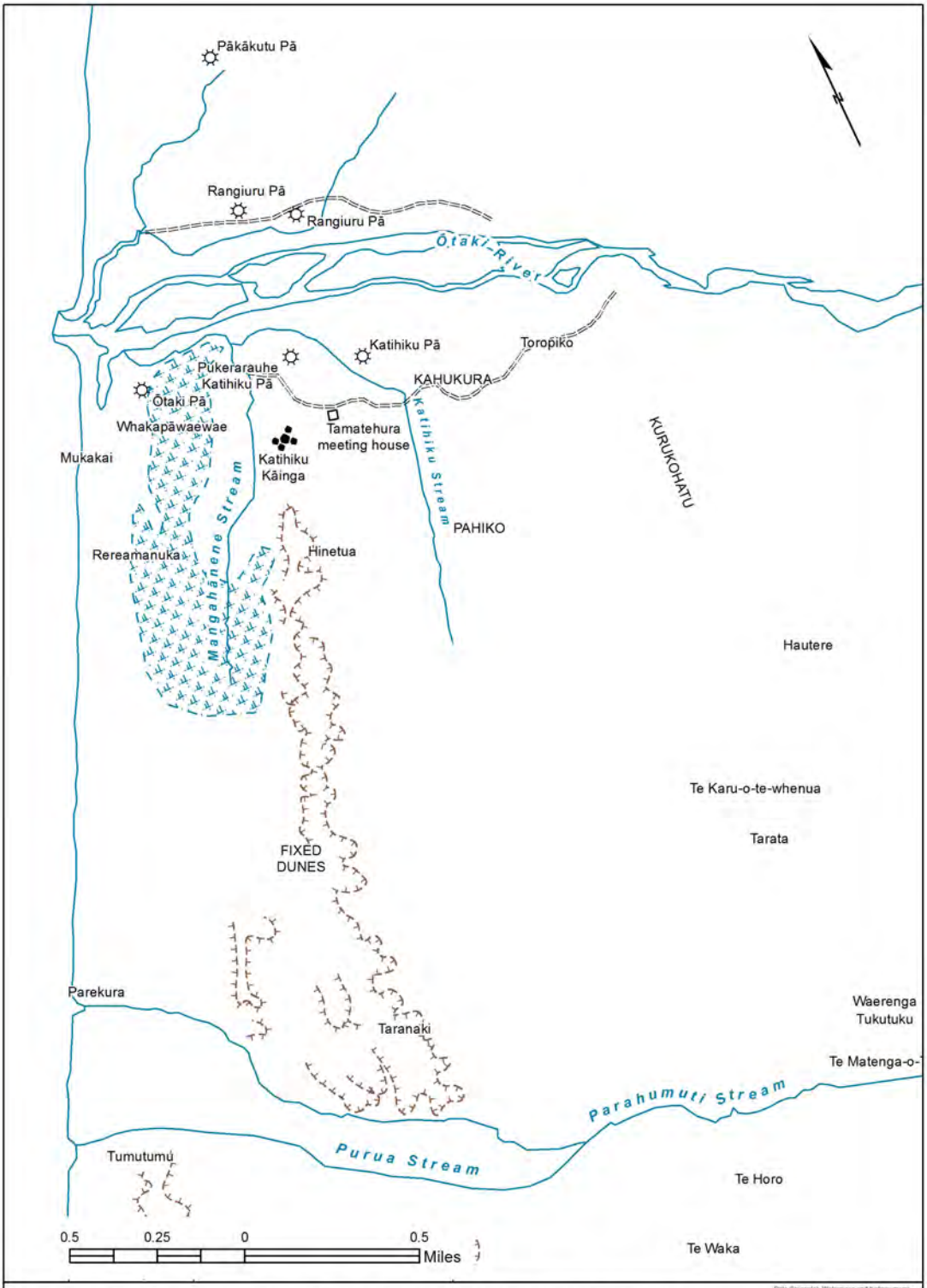

N
Mangahao River
Mangahao No.1 Reservoir
Mangahao No. 2 Reservoir
Arapeti Reservoir
Arapeti Stream
Manga-tangi Stream
Manga-puke-tea Stream
Kaihinau
Manga-harakeke Stream
Kara Stream
Otauru Stream
Pohatu Stream
Taraihi Burual Ground
Mākurerua Swamp
Tokomaru River
1.5 0.75 0 1.5
Miles
Map. XII

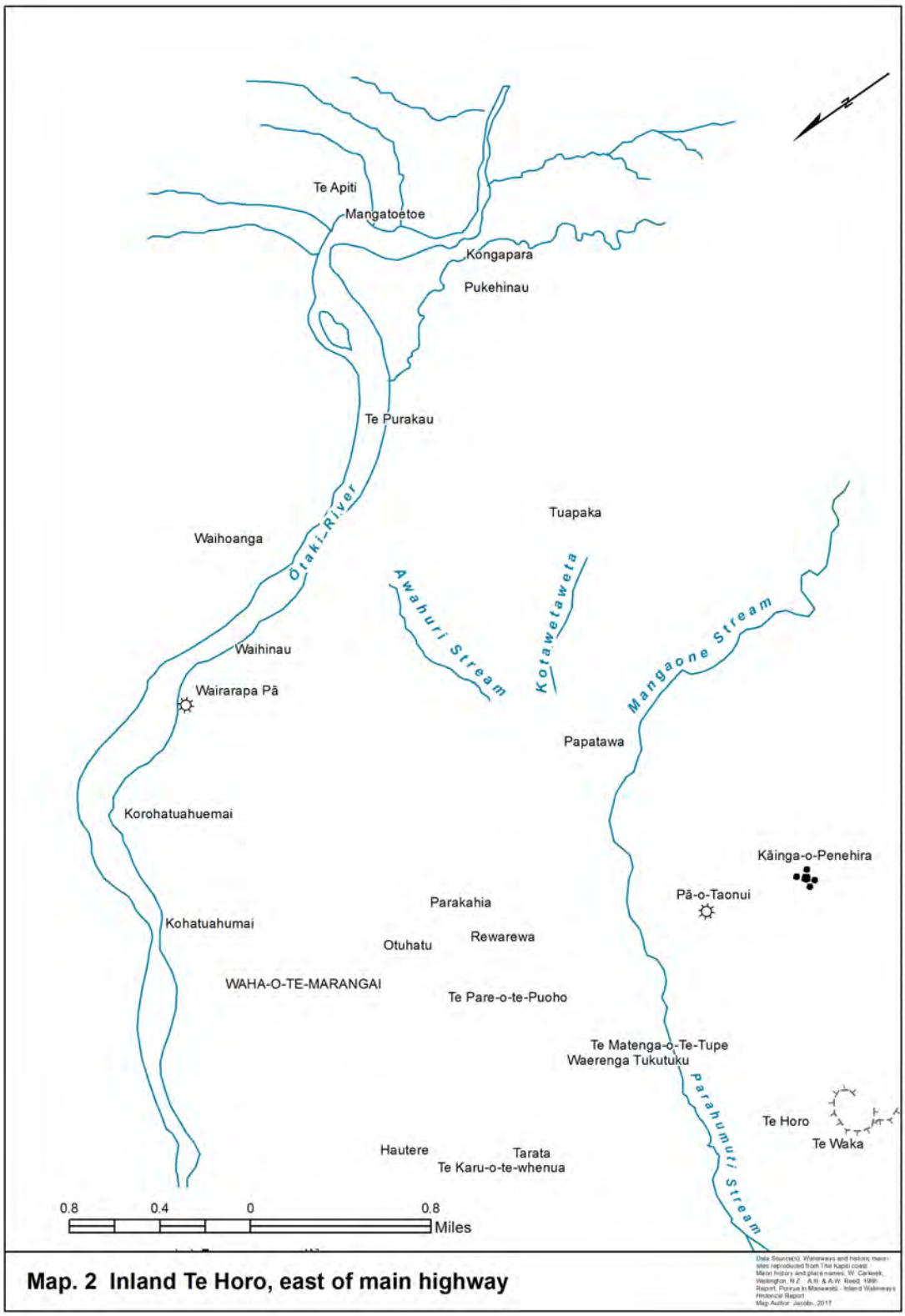
Maps by W Carkeek:

Maps from the publication of Wakahuia Carkeek have also been reproduced in colour to provide a similar set of maps for the south of the inquiry district along the Kāpiti coastline.[1509]

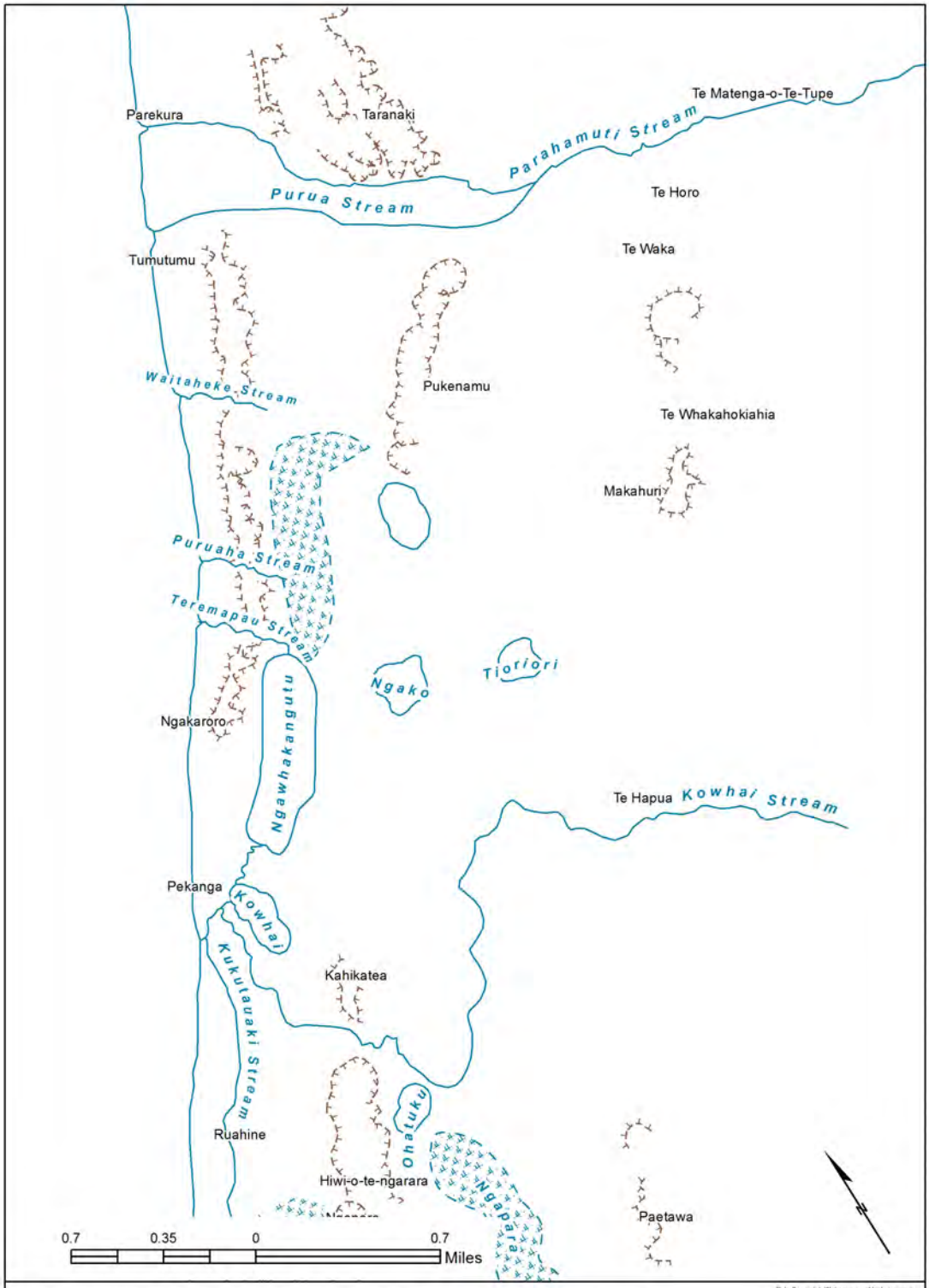
[1509] W Carkeek, The Kāpiti Coast: Māori History and Place Names of the Paekākāriki-Ōtaki District (Wellington: Reed Books, 1966).



Map. 1 Coastal area from Ōtaki River to Parahumuti Stream

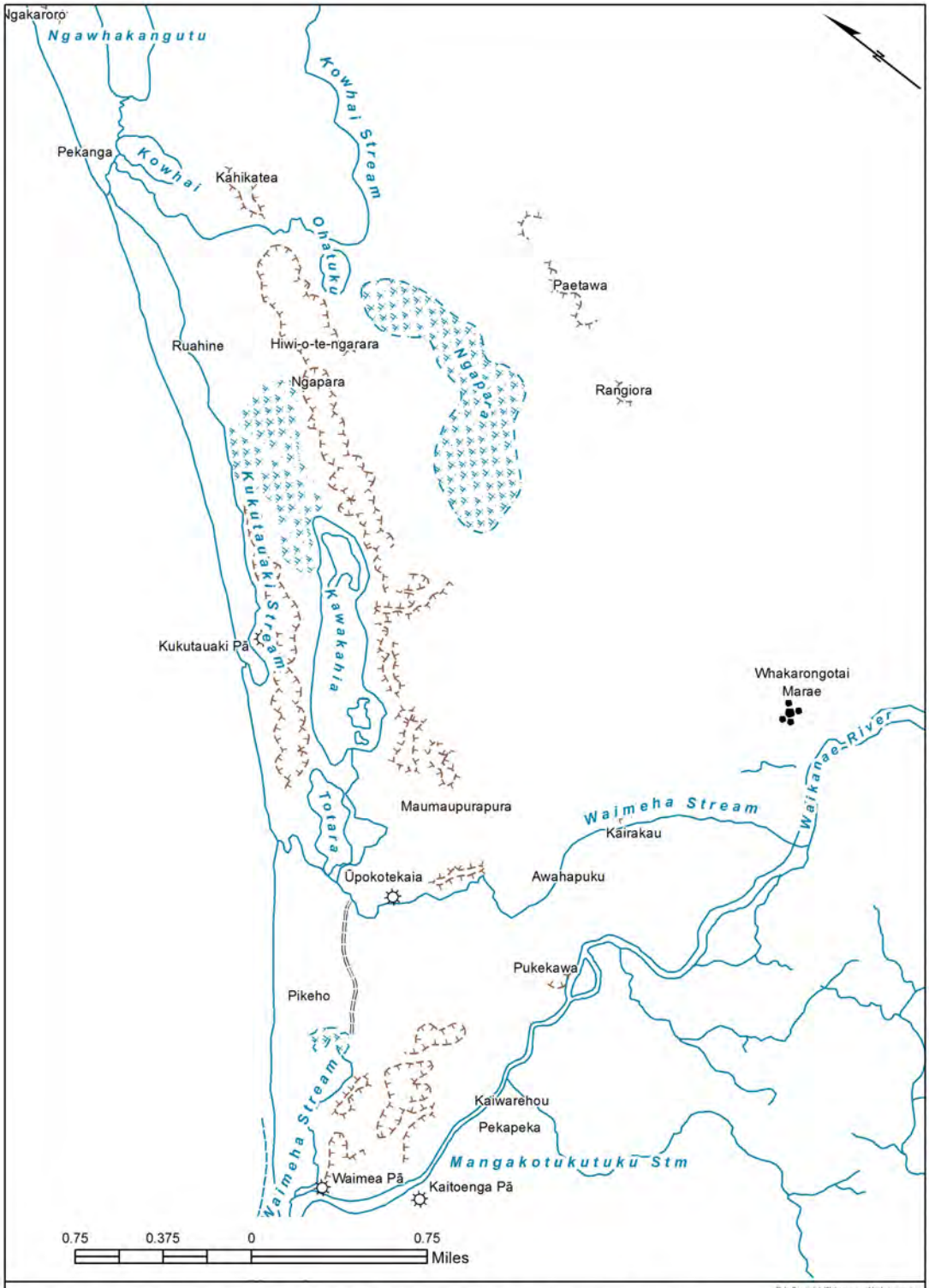


Map. 2 Inland Te Horo, east of main highway

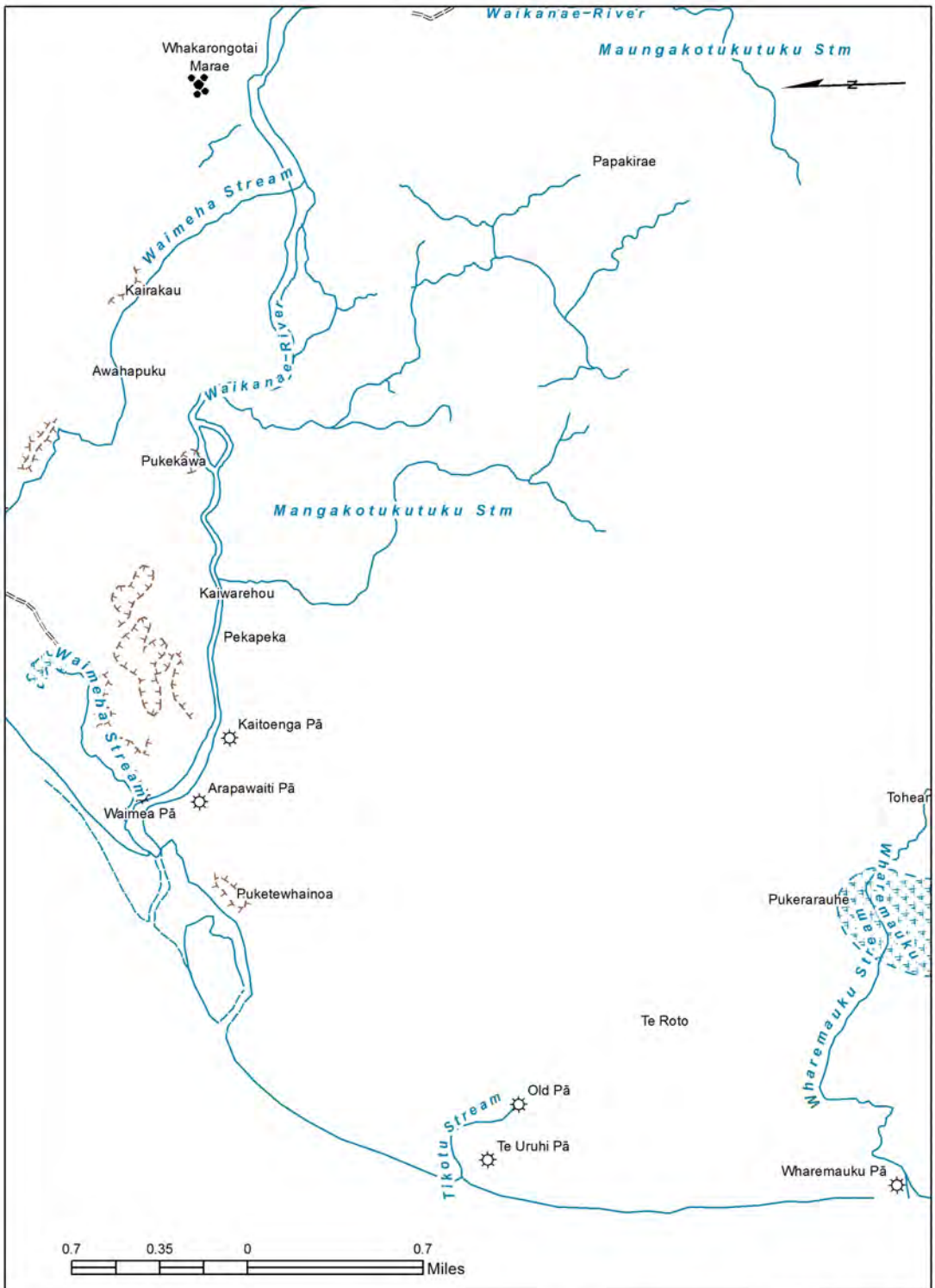


Map. 3 Coastal area from Parahamuti Stream to Ruahine

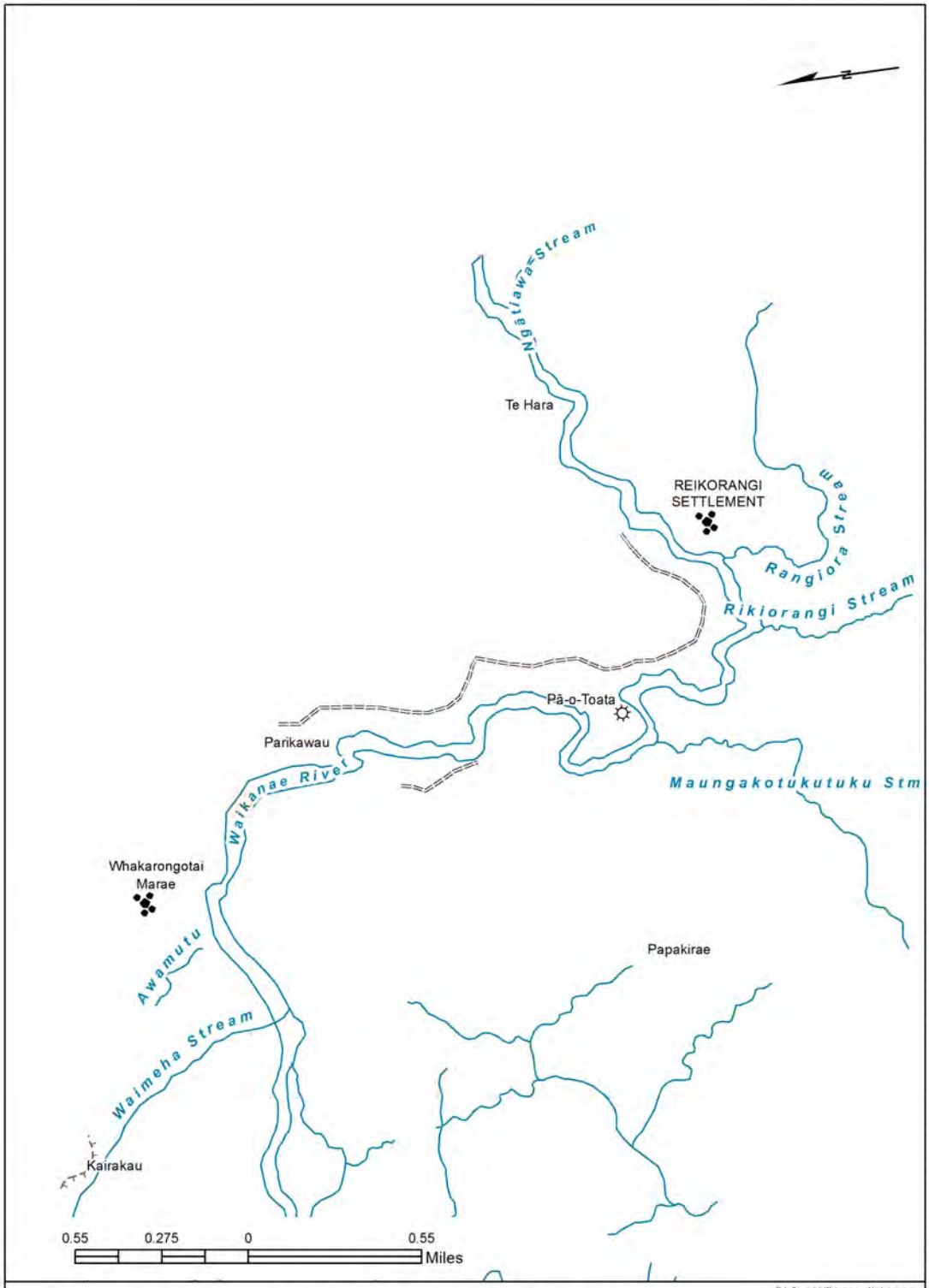
Data Source(s): Waterways and historic maori sites reproduced from The Kapiti coast: Maori history and place names, W. Carkeek, Wellington, N.Z. : A.H. & A.W. Reed, 1966
Report: Porirua to Manawatū - Inland Waterways Rhtoncal Report
Map Author: Jacobs, 2017



Map. 4 Main Waikanae coastal area north of Waikanae River

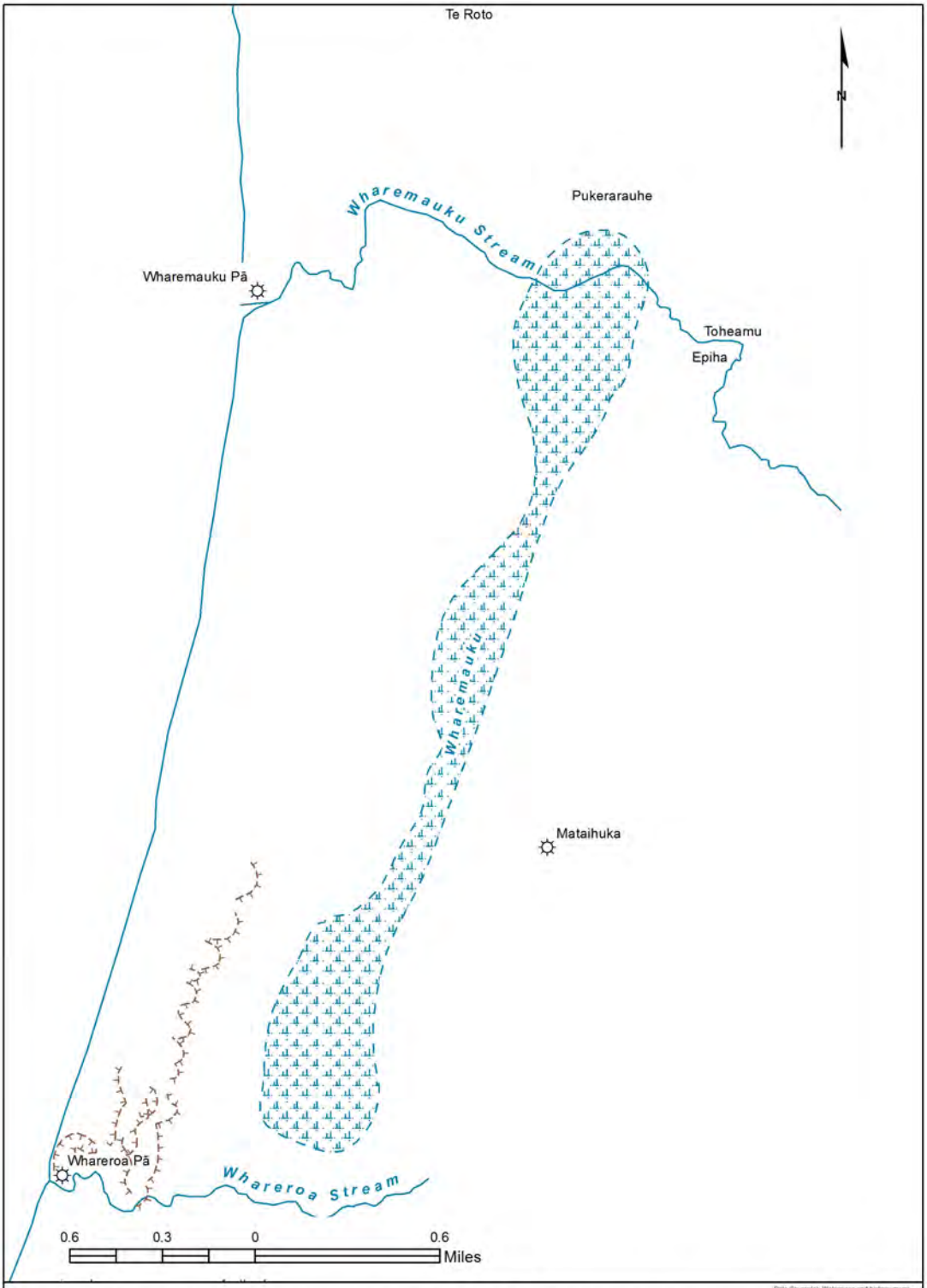


Map. 5 Paraparaumu coastal area from Waikanae to Wharemauku



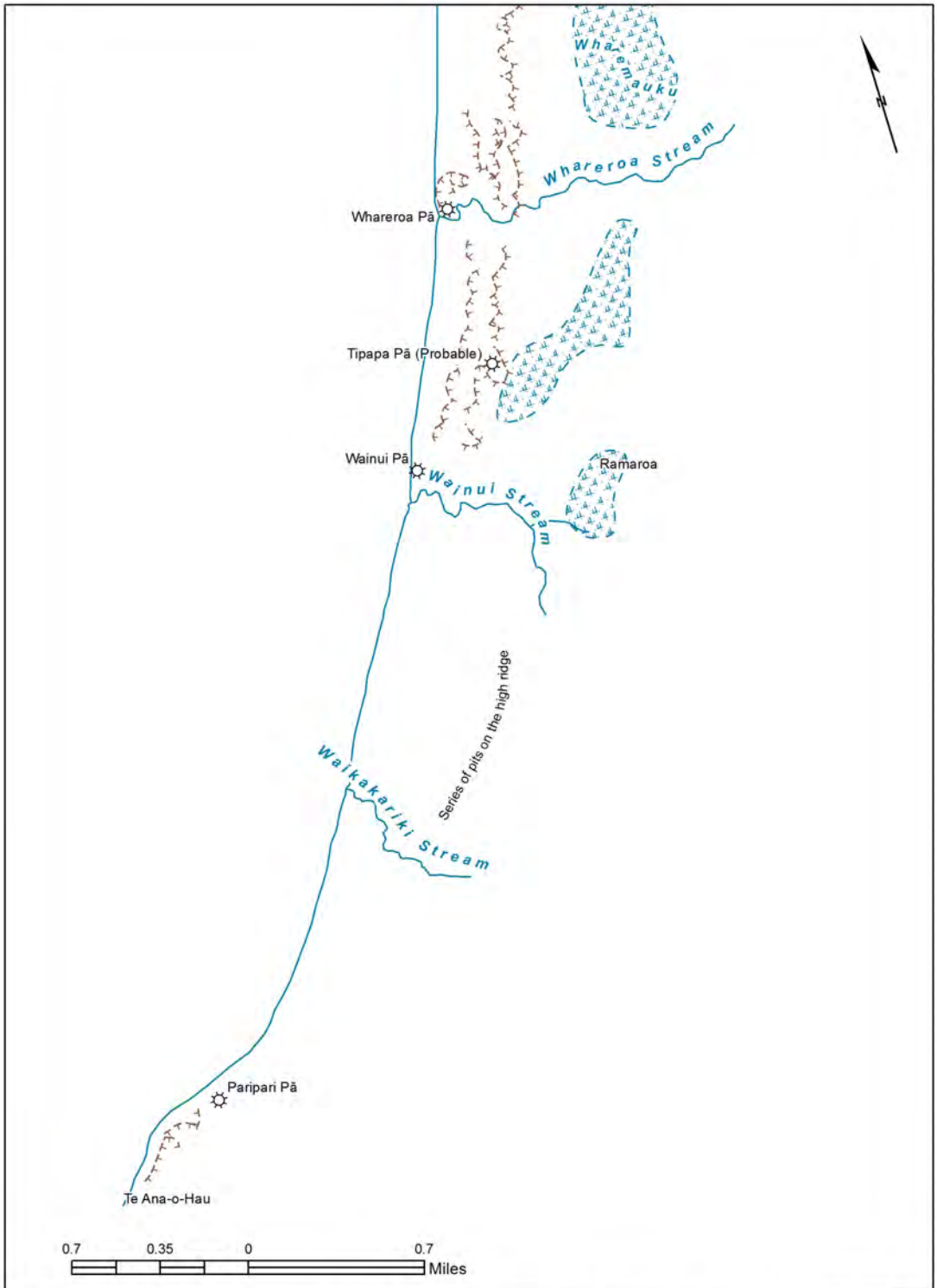
Map. 6 Waikanae River from main highway to Reikorangi

Data Source(s): Waterways and historic maori sites reproduced from The Kapiti coast Maori history and place names, W. Carkeek, Wellington, N.Z. A.H. & A.W. Reed, 1966. Report: Porirua to Manawatū - Inland Waterways Historical Report
Map Author: Jacobs, 2011

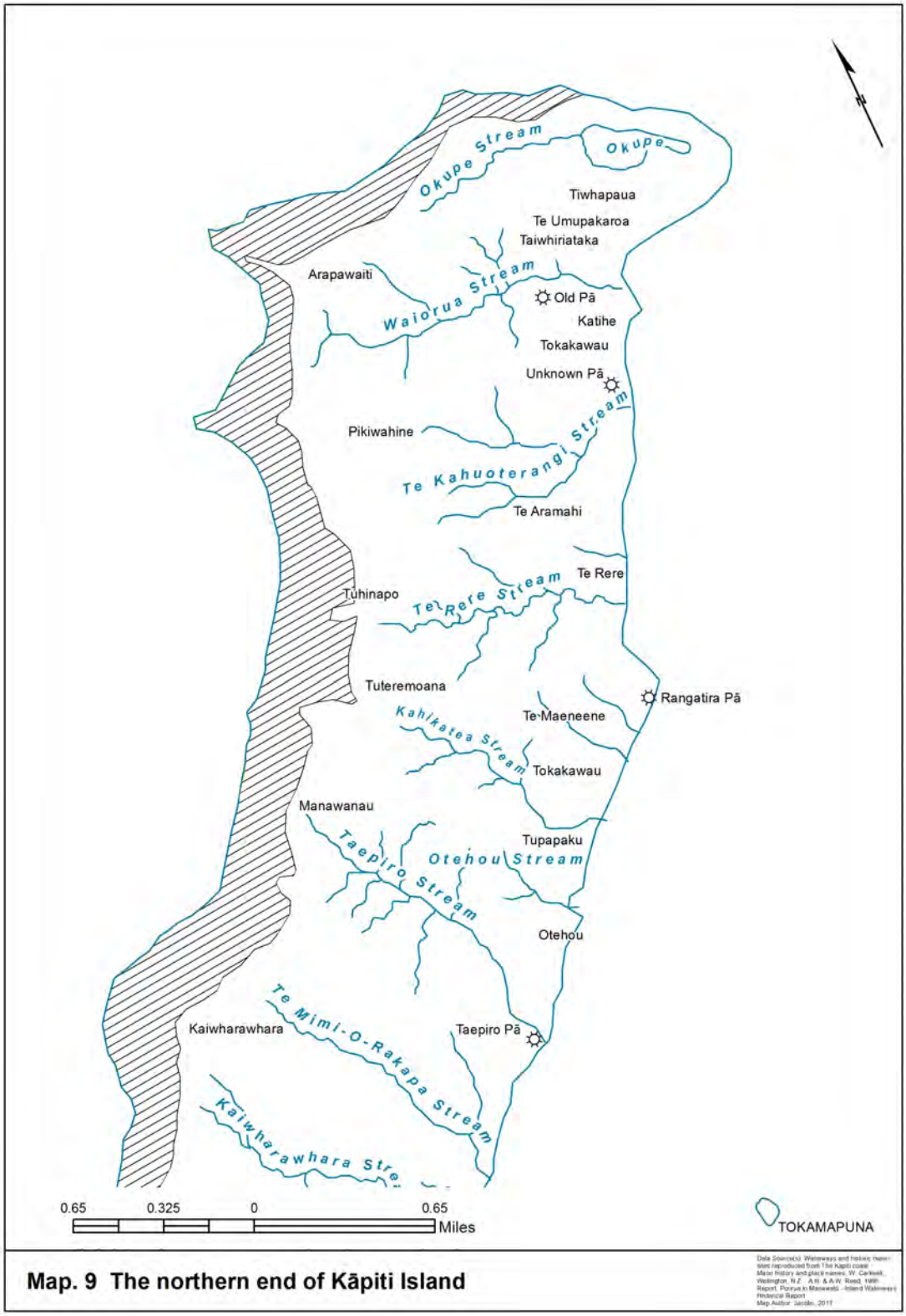


Map. 7 Southern Paraparaumu coastal area to Paekakariki

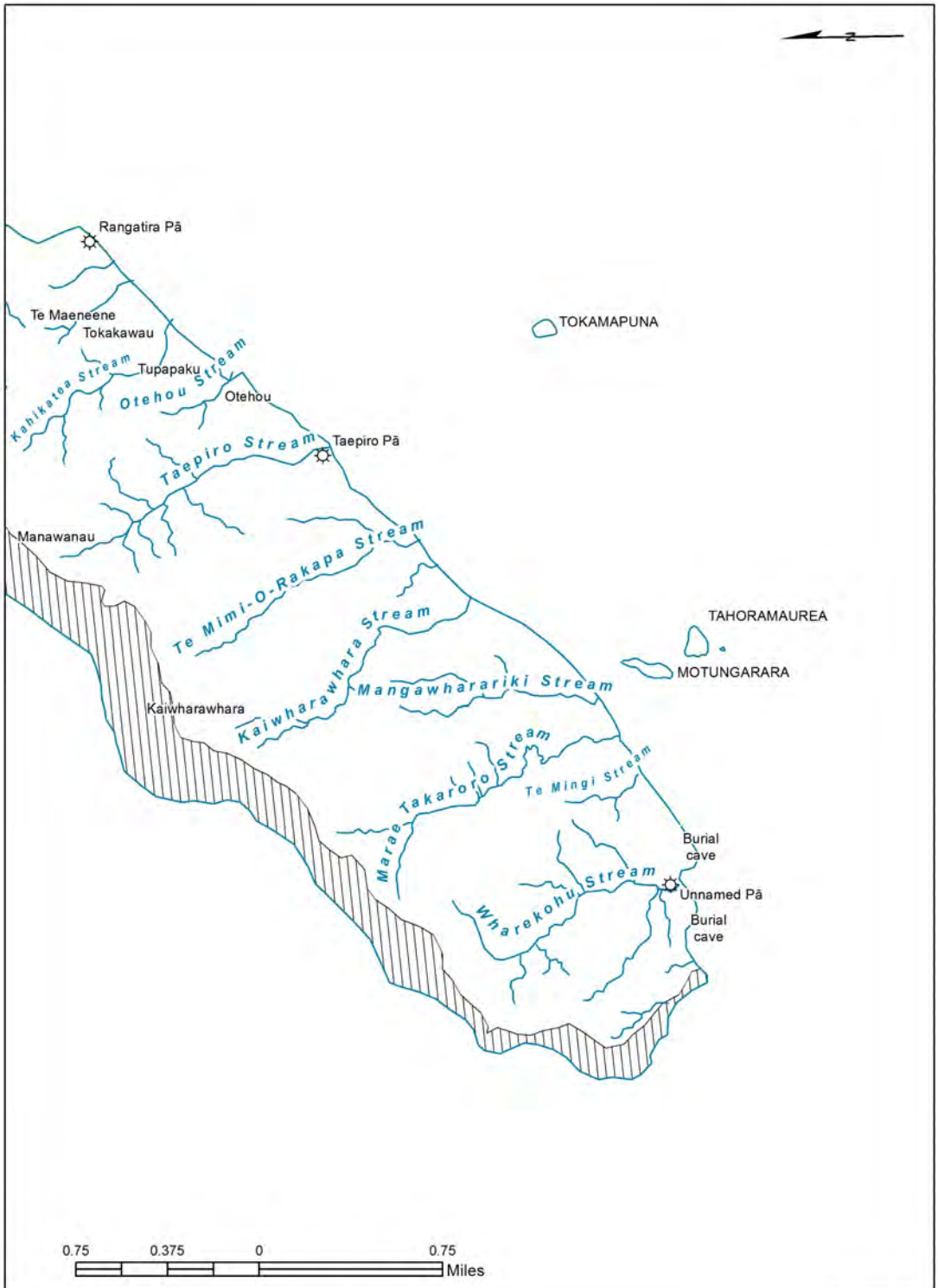
Data Source(s): Waterways and historic maori sites reproduced from The Kapiti coast Maori history and place names, W. Carkeek, Wellington, N.Z. A.H. & A.W. Reed. 1966. Report: Porirua ki Manawatū - Inland Waterways Historical Report
Map Author: Jacobs, 2017



Map. 8 Paekakariki coastal area from Whareroa to Paripari



Map. 9 The northern end of Kāpiti Island



Map. 10 The southern end of Kāpiti Island

Appendix VII: Local Authorities with Jurisdiction that Relates to Inland Waterways in the Inquiry District

1. History of regional government entities in the inquiry district

Horizons Regional Council

The Horizons Regional Council is the existing local government authority for the Feilding to Manakau area of the inquiry district. The Manawatū Wanganui Regional Council was set up in 1989 as an amalgamation of Catchment Boards, Drainage Boards, Pest Destruction Boards, United Councils and Noxious Plant Authorities in the region. A transitional committee was appointed to guide the amalgamation work for the region and this was based at the offices of the Manawatū Catchment Board, which was the principal local authority. In 1999 the Council changed its trading name to horizons.mw. In 2003 this was changed to Horizons Regional Council.

The following sets out the historical municipal entities which either preceded or were amalgamated into Horizons.

Manawatū Regional Development Council

The Manawatū Regional Development Council was a voluntary, joint regional body, set up in 1967, comprising of the territorial Local Authorities. The purpose of the Council was the wellbeing and advancement of the region. The Council was wound up in 1981 in favour of a Manawatū United Council.

Horowhenua District Noxious Plants Authority

Under the 1950 Noxious Weeds Act County Councils were responsible for ensuring control of noxious plants. In 1976, under this act, the Horowhenua County Council formed the Horowhenua District Noxious Plants Authority to oversee the carrying out of this function. In 1978 the Noxious Plants Act was passed, which required all local authorities to form District Noxious Plant Authorities (DNPAs) for their area. Rather than each council setting up their own individual authority the Levin Borough Council, Ōtaki Borough Council, Kāpiti Borough Council and the Horowhenua County Council investigated forming a joint DNPA. In 1979 the new Horowhenua District Noxious Plants Authority was formed. The Authority was responsible for employing a Noxious Plants Officer, approved subsidised noxious plant control programmes and recommended

to the Noxious Plants Council the classification of plants in their district. In 1989 the Horowhenua Authority was amalgamated with a number of others to form the new Manawatū Wanganui Regional Council.

Horowhenua United Council

In 1977 the Interim Horowhenua United Council was formed by the Horowhenua County Council and the Levin, Ōtaki and Kāpiti Borough Councils. Although it did not have any statutory backing under the Local Government Act 1974, it was a completely legal body under the Counties Act 1956, the Municipal Corporations Act 1957, the Civil Defence Act 1956 and the Town and Country Planning Amendment Act 1972. The Council was responsible for the coordination of civil defence and development of a regional plan. The Council did not have its own staff, instead they were provided by the Horowhenua County Council based in Levin. In 1989 the Horowhenua United Council was amalgamated with a number of other authorities to form the Manawatū Wanganui Regional Council.

Manawatū District Noxious Plants Authority

The Manawatū District Noxious Plants Authority was constituted by the Manawatū, Oroua and Kairanga County Councils pursuant to the Noxious Plants Act 1978. In 1979 the new Manawatū District Noxious Plants Authority was. The Authority was responsible for employing a Noxious Plants Officer, approved subsidised noxious plant control programmes and recommended to the Noxious Plants Council the classification of plants in their district. In 1989 the Manawatū Authority was amalgamated with a number of others to form the new Manawatū Wanganui Regional Council.

Manawatū United Council

In 1981 the Manawatū United Council was officially created following declarations from the four local councils. The Council was responsible for the coordination of civil defence and development of a regional plan. The Council did not have its own staff, instead they were provided by the Palmerston North City Council. In 1989 the Manawatū United Council was amalgamated with a number of other authorities to form the Manawatū Wanganui Regional Council.

Greater Wellington Regional Council

The current Greater Wellington Regional Council (GWRC) was established in 1980 upon the amalgamation of the Wellington Regional Water Board and the Wellington Regional Planning Authority.

Wellington Regional Water Board

The Wellington Regional Water Board (WRWB) was constituted by the Wellington Regional Water Board Act 1972 (the WRWB Act) to be a Regional Water Board within the meaning of the Water and Soil Conservation Act 1967. GWRC continues to act under the WRWB Act.

The WRWB Act constituted the Wellington Water Region as a water region within the meaning of the Water and Soil Conservation Act 1967. The WRWB's area of operations extended from Waikanae in the north and the Orongorongo ranges in the east and took over some areas within the Manawatū Catchment District.

The WRWB was responsible for the bulk supply of pure water to its constituent authorities and was empowered under the WRWB Act to take water from any river, stream, lake, pool or bore (subject to the Water and Soil Conservation act 1967). The WRWB could also at the time of flooding, divert water from rivers to any natural stream to protect waterways. The WRWB was also responsible for forestry areas and water collection areas and could make bylaws in relation to these areas and any waterways within the region, although the Minister of Works and Development could override the bylaws in certain circumstances. The WRWB was subject to certain provisions of the Soil Conservation and Rivers Control Act 1941 and was treated as a Catchment Board for the purposes of those provisions.

2 History of district and city councils in the inquiry district

Horowhenua District Council and Manawatū District Council

The current Horowhenua District Council (HDC) was established 1989. HDC amalgamated the Horowhenua County Council, Levin Borough, Foxton Borough and part of the first Manawatū District Council. The rest of the first Manawatū District Council amalgamated with the Feilding Borough, Pohangina County, Kiwitea County and the bulk of Oroua County to form a new Manawatū District Council. The southern part of the

Horowhenua County from Pukekou Hill south, around the Waikanae and Ōtaki areas, became part of the new Kāpiti Coast District Council.

Manawatū County Council

The Manawatū County Council was formed in 1876. Its predecessor was the Wellington Provincial Government. As originally constituted the MCC ran from Waikanae in the south to Rangiwahia in the north. Like many of the first counties, parts of the Manawatū County gradually broke away and formed their own counties or boroughs. The Palmerston North Borough Council was formed first in 1877, with Feilding Borough Council next in 1881.

The County was then split in half in 1883 when the first Oroua County was formed. This was quickly followed by the Horowhenua County Council, which broke away in 1884. This left the County covering a fraction of its original 1876 area. In 1888 the Foxton Borough Council was formed. In 1988 the Manawatū County amalgamated with neighbouring Kairanga County to form the first Manawatū District Council. In 1989 this amalgamated with several other councils to form a new, much larger, Manawatū District Council.

Horowhenua County Council

Horowhenua County Council (HCC) was established in 1885 from the Southern Part of the Manawatū County. The offices of the County were first established in Ōtaki. As first established the County had three ridings: Ōtaki (area surrounding Ōtaki township), Te Horo (southern portion of county around Waikanae) and Wirokino (northern portion of county including Levin and Shannon). In 1893 part of Wirokino Riding was split off to form Tokomaru Riding which started just south of Shannon and covered the northern most part of the county. On the 9th of February 1898 a major fire destroyed the County Offices and many early records were lost. Some records survived the fire in a safe, although many were badly charred.

Shannon Borough Council

The Shannon Borough Council was constituted on 1 August 1917 from Horowhenua County Council. In 1966 the Borough amalgamated back into the Horowhenua County Council and a county town committee was formed for the town.

Ōtaki Road Board

Originally constituted as the Ōtaki Highways Board in 1878. With the passing of the 1882 Road Boards Act, the Highway Board was renamed as a Road Board. The Board amalgamated into Horowhenua County Council in 1913.

Te Horo Road Board

The Board was one of two formed in January 1884 from the Ōtaki Road Board. In 1907 [or 1906 – website lists both years] the Te Horo Road Board merged into Horowhenua County Council.

Wirokino Road Board

The Board was one of two formed in January 1884 from the Ōtaki Road Board. In 1903 the Wirokino Road Board merged into Horowhenua County.

Levin Borough Council

The Levin Borough Council (LBC) was formed in 1906 from part of the Horowhenua County Council.

Foxton Borough Council

The Foxton Borough Council (FBC) was formed from the Foxton Town Board in 1888.

Foxton Town Board

The Foxton Town Board was first constituted as the Foxton Local Board in 1873. With the passing of the Town Districts Act 1881 the Board was renamed the Foxton Town Board. In 1888 the Board was constituted as a Borough.

Feilding Borough Council

The Feilding Borough Council was formed in 1881 from part of the Manawatū County Council. In 1989 it amalgamated with several other councils to form the new Manawatū District Council.

Pohangina County Council

The Pohangina County Council was created in 1895 from the Pohangina Road Board and the part of the Oroua County that it covered.

Pohangina Road Board

The Pohangina Road Board (PRB) was formed from the Kiwitea Road Board in 1892. PRB had the powers and responsibilities of a County Council, due to an earlier decision in 1884 to suspend the operation of the Counties Act within the boundaries of the first Oroua County Council. In 1895 the Pohangina Road Board formally split from the Oroua County and formed the basis of the Pohangina County Council.

Kiwitea County Council

The Kiwitea County Council was created in 1894 from the Kiwitea Road Board and the area of Oroua County Council that it covered.

Kiwitea Road Board

The Kiwitea Road Board (KRB) was formed from the Manawatū Road Board in 1882 and first met on the 9th of December of that year. KRB assumed the responsibilities and powers of a County Council in 1884 when the operation of the Counties Act was suspended within the boundaries of Oroua County Council. In 1894 the KRB formally split from the Oroua County Council and formed the basis of the new Kiwitea County Council.

Manawatū Road Board

The Manawatū Highway Board was one of eight formed in 1872 by the Wellington Provincial Government to cover the whole of the province. It was the first unit of local government in the inland Manawatū district. Its territory originally included the Foxton, Sanson and Feilding districts, but during the 1870s and 1880s these districts formed their own road boards and the territory of the Manawatū Road Board was confined to the land between the south bank of the Oroua River and the crest of the Tararua Range.

In 1876 the Manawatū Highway Board came under the Manawatū County Council. With the passing of the 1882 Road Boards Act, the Highway Board was renamed as a Road Board. In 1883 half of Manawatū County separated to form the Oroua County Council,

which the Board now came under. In 1884 the Board assumed the powers of a county when the operation of the Counties Act was suspended within the boundaries of Oroua.

In 1889 the Board's territory was further divided, with the Fitzherbert Road Board being established to control the land between the south bank of the Manawatū River and Tararua Range, leaving the Manawatū Road Board the land between the south bank of the Oroua River and the north bank of the Manawatū River. The Manawatū Road Board remained as a separate administration until 1902, when it was amalgamated with the Fitzherbert Road Board to form the new county of Kairanga.

Oroua County Council

The Oroua County Council was first formed in 1883, breaking away from the Manawatū County Council and covered most of the area of the present day Manawatū District Council and some of what is now the Palmerston North City Council. In 1884 and the council's powers were devolved to road and town boards and ceased to have any staff or conduct any work, with all responsibilities now devolved to the Road and Town Boards.

The Council of 1890 did not meet and the councillors gradually lost their positions during the 1890s as the Road Boards split or became County Councils in their own right. By 1902 the Manchester Road Board and the Halcombe Town Board were the only remaining Boards in Oroua County, the others having formed the Kiwitea, Pohangina and Kairanga Counties. In 1902 the Manchester Road Board petitioned for the Counties Act to be reinstated in what remained of the Oroua County. This was granted in 1903, the Road Board was dissolved and was used as the basis for reforming the Oroua County Council.

This new Council later took over several Boards and Committees in the township of Ashhurst. OCC remained in existence until 1989 when several councils merged to form the Manawatū District Council, except for the portion of land containing the Ashhurst township which was absorbed into the Palmerston North City Council. While records of the OCC were assigned to the newly established Manawatū District Council some of those pertaining to Ashhurst were assigned to PNCC.

Manchester Road Board

The Manchester Highway Board was formed in 1876 from the Manawatū Highways Board (later Road Board) (see Manawatū Road Board) and came under the Manawatū County Council. After the passing of the 1882 Road Boards Act, all Highway Boards were renamed as Road Boards. In 1883 half of Manawatū County separated to form the Oroua County Council, which the Board now came under. In 1884 the Board assumed the powers of a county when the operation of the Counties Act was suspended within the boundaries of Oroua.

Palmerston North City Council

Palmerston North came into official existence in 1866 under the name of 'Palmerston' (North was added by the postal authorities in 1871) and was administered by the Wellington Provincial Council. In 1877 it became a self-governing Borough and elected its first Borough Council. In 1930, Palmerston North reached city status, with a resulting name change to the Palmerston North City Council. In 1989 a major territorial change took place, whereby Palmerston North took over the territory of Kairanga County Council and part of the Oroua County Council (Ashhurst).

Rangitikei District Council

The Rangitikei District Council was formed in 1989 and amalgamated amongst other entities, the Rangitikei County Council.

Rangitikei County Council

The Rangitikei County Council was established in 1876 and was created to replace amongst other entities Bulls Town Board/Town Council which had been operating since 1873. Bulls County Town Committee was established in 1857, which was replaced by a County Borough Council in 1971 and a District Community Council in 1974.

Kāpiti Coast District Council

The current Kāpiti Coast District Council (KCDC) was established in 1989 and replaced the Kāpiti Borough Council and Ōtaki Borough Council.

Kāpiti Borough Council

The Kāpiti Borough Council was established in 1973. The area governed by the Kāpiti Borough Council was formerly governed by the Hutt County Council and the Horowhenua County Council immediately prior to the establishment of the Kāpiti Borough Council.

Hutt County Council

The Hutt County Council was established in 1877and covered the whole Wellington region from south of the Waikanae River, except for Wellington City. The Hutt County initially had 8 ridings: Belmont, Epuni, Horokiwi, Makara, Mungaroa, Porirua, Wainui-o-mata and Whareroa. Kāpiti was originally within the Horokiwi Riding. The Hutt County Council was abolished in 1988.

Waikanae County Town Committee

The Waikanae County Town Committee was a committee of the Horowhenua County Council. In 1954 the Horowhenua County Council proposed the Waikanae County Township. In 1954 a description of the Waikanae County Township was supplied to the Manawatū Catchment Board to form the basis of the Waikanae Scheme classification area.

Ōtaki Borough Council

The Ōtaki Borough Council was established in 1921. It is noted that between 1921 and 1927, attempts were made to provide a sewerage scheme, which failed, leaving the borough council heavily in debt. Three commissions investigated affairs of the borough.

In 1922, high pressure water supply from Waitohu Stream was provided by the Ōtaki Borough Council. The Ōtaki Borough Council was disestablished in 1989. An Ōtaki Road Board (see above) was established in 1878. This was replaced by the Ōtaki Town Board 1912 which also took over the Ōtaki Cemetery and Domain (this is contrary to what the Archives Central say, that the Ōtaki Road Board amalgamated into the Horowhenua County Council).

Paekākāriki County Town

Paekākāriki became a County Town in 1960.

Paraparaumu County Town Council

Until 1974, Paraparaumu was part of the Kāpiti riding but gained borough status in 1974 until 1989 when the Kāpiti Coast District Council was formed.

Porirua City Council

The Hutt County Council was established in 1877 and covered the whole Wellington region from south of the Waikanae River, except for Wellington City. The Makara County Council was then established in 1907 and covered the Porirua area. The Porirua Borough Council was established in 1962 from within the Makara County Council. The Porirua Borough Council changed its name to the Porirua City Council in 1965.